Designed for Microsoft Windows NT and Windows 95

CD-ROM Included

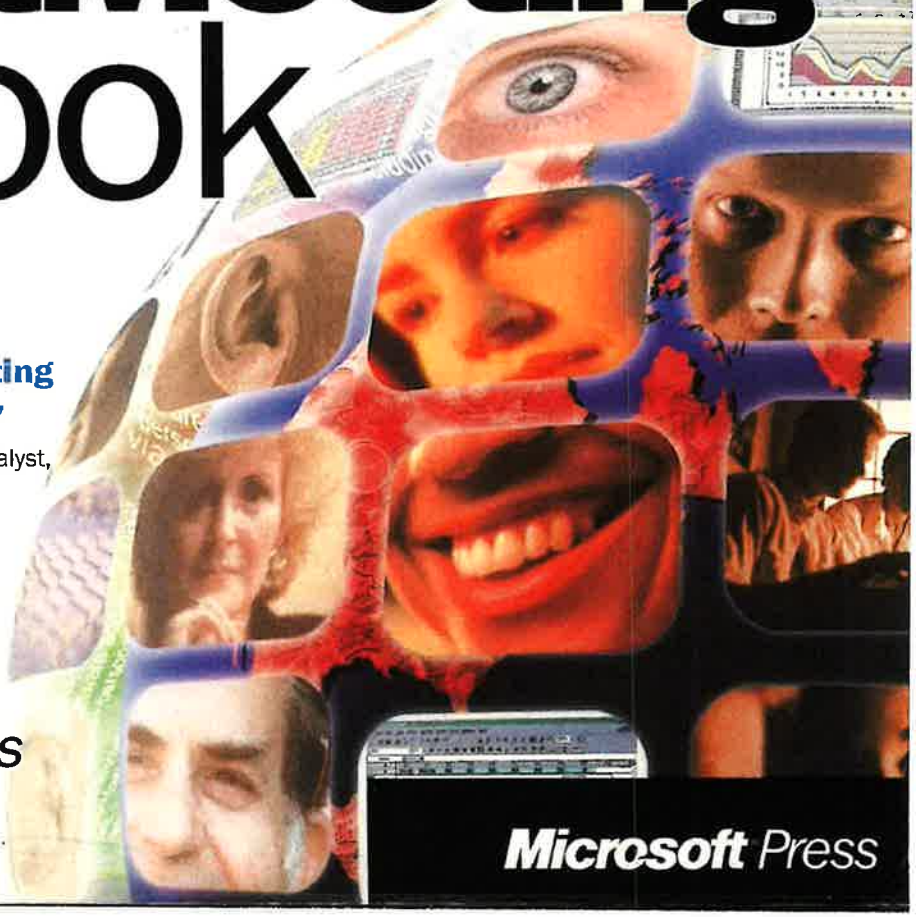
Microsoft Internet Explorer 4.0

For Microsoft® Windows NT® and Windows® 95 Operating Systems

The Comprehensive Guide to Internet Teleconferencing with Microsoft NetMeeting 2.1

Included on CD-ROM!
Microsoft NetMeeting 2.1
Microsoft Internet Explorer 4

Official Microsoft® NetMeeting™ Book



"This is the NetMeeting bible! A must have!"
—Kelly Hobbie, Systems Analyst, COX Communications

Bob Summers

Microsoft Press

OFFICIAL Microsoft® NETMEETING BOOK

Bob Summers

Microsoft Press

PUBLISHED BY
Microsoft Press
A Division of Microsoft Corporation
One Microsoft Way
Redmond, Washington 98052-6399

Copyright © 1998 by Robert Summers

All rights reserved. No part of the contents of this book may be reproduced or transmitted in any form or by any means without the written permission of the publisher.

Library of Congress Cataloging-in-Publication Data
Summers, Robert, 1972-
Official Microsoft NetMeeting Book / Robert Summers.
p. cm.
Includes index.
ISBN 1-57231-816-3
1. Internet videoconferencing--Computer programs. 2. Microsoft NetMeeting. 3. Computer conferencing. I. Title.
TK5105.875.I57S87 1998
005.7'13769--dc21 97-39003
CIP

Printed and bound in the United States of America.

2 3 4 5 6 7 8 9 WCWC 3 2 1 0 9 8

Distributed in Canada by ITP Nelson, a division of Thomson Canada Limited.

A CIP catalogue record for this book is available from the British Library.

Microsoft Press books are available through booksellers and distributors worldwide. For further information about international editions, contact your local Microsoft Corporation office. Or contact Microsoft Press International directly at fax (425) 936-7329. Visit our Web site at mspress.microsoft.com.

Macintosh is a registered trademark and the Mac OS Logo is a trademark of Apple Computer, Inc. used under license. BIGFOOT and Snake Bite are registered trademarks of BigFoot 4x4, Inc. Kodak is a registered trademark of Eastman Kodak Company. All rights reserved. Intel is a registered trademark of Intel Corporation. ActiveX, FrontPage, Microsoft, Microsoft Press, PowerPoint, and Visual Basic are registered trademarks and MSN, NetMeeting, Netshow, Outlook, and Visual InterDev are trademarks of Microsoft Corporation. WebTV is a registered trademark of WebTV Networks, Inc. Other product and company names mentioned herein may be the trademarks of their respective owners.

For Microsoft Press
Acquisitions Editor: David Clark
Project Editor: Maureen Williams Zimmerman

For LightSpeed Publishing, Inc.
Project Editor: Joel Fugazzotto
Development Editor/Copyeditor: Scott Calamar
Technical Editor: Brent Ethington
Production: Michele Cuneo

To my mother, Debbie, who throughout my life has provided me with strength and inspiration to accomplish my dreams.

Chapters at a Glance

Part I Getting Started with NetMeeting

Chapter 1	**NetMeeting Overview**	**3**
Chapter 2	**Preparing Your System**	**15**
Chapter 3	**Installation**	**31**
Chapter 4	**Making Your First Call**	**55**

Part II Using NetMeeting's Features

Chapter 5	**Chat and Whiteboard**	**79**
Chapter 6	**Working with Audio**	**95**
Chapter 7	**Video Conferencing**	**115**
Chapter 8	**Application Sharing and File Transfer**	**149**

Part III NetMeeting in the Business World

Chapter 9	**Hosting a Group Conference**	**173**
Chapter 10	**Considering Security**	**189**
Chapter 11	**Configuring Corporate Firewalls**	**199**
Chapter 12	**NetMeeting as Part of Your Network**	**209**
Chapter 13	**Setting Up Your Own NetMeeting Place**	**219**
Chapter 14	**Programming the NetMeeting SDK**	**239**

Part IV Troubleshooting NetMeeting

Chapter 15	**Troubleshooting Audio**	**267**
Chapter 16	**Troubleshooting Video**	**281**
Chapter 17	**General Troubleshooting Techniques**	**291**

Part V NetMeeting Resources

Chapter 18 **Products That Extend NetMeeting** 313
Chapter 19 **Frequently Asked Questions** 329

Appendixes

Appendix A **Glossary** 343
Appendix B **Additional Online Information** 351

Index 357

SAMSUNG EXHIBIT 1017, Page 6

Contents

Acknowledgments xiii
Introduction xv

Part I Getting Started with NetMeeting

Chapter 1 **NetMeeting Overview** 3
WHAT YOU NEED TO KNOW TO USE NETMEETING EFFECTIVELY 5
TELECONFERENCING EXPLAINED 8
FROM HERE... 14

Chapter 2 **Preparing Your System** 15
PREPARING YOUR SYSTEM FOR NETMEETING 16
CONNECTING YOUR COMPUTER 23
GETTING YOUR AUDIO DEVICES READY 24
SETTING UP AND TESTING YOUR VIDEO CAPTURE DEVICE 26
FROM HERE... 29

Chapter 3 **Installation** 31
DOWNLOADING NETMEETING 32
PREPARING FOR INSTALLATION 33
INSTALLING NETMEETING 34
SETTING UP NETMEETING 35
CHANGING SETTINGS AFTER NETMEETING IS INSTALLED 44

SAMSUNG EXHIBIT 1017, Page 7

Customizing NetMeeting Sounds 52
Troubleshooting with the Intel Connection Advisor 52
From Here... 53

Chapter 4 **Making Your First Call** 55
Using NetMeeting with the Internet or a Corporate LAN 56
Connecting with NetMeeting on the Internet or Corporate LAN 61
Using NetMeeting's SpeedDial 71
Connection: What Happens Now? 74
Alternatives When Connecting Proves Difficult 75
From Here... 75

Part II Using NetMeeting's Features

Chapter 5 **Chat and Whiteboard** 79
Using the Chat Feature 80
Using the Whiteboard 85
From Here... 93

Chapter 6 **Working with Audio** 95
Audio and Your PC 96
How Computer Telephony Works 97
Full-Duplex and Half-Duplex 103
Understanding Audio Standards 106
How Your Machine Compresses Audio 107
From Here... 113

Chapter 7 **Video Conferencing** 115
Understanding Internet Video Conferencing 116
Video Conferencing Technology 119
Video on Computers versus Video on TV 126

SAMSUNG EXHIBIT 1017, Page 8

SHOPPING FOR VIDEO CONFERENCING EQUIPMENT 128
OPTIMIZING YOUR VIDEO CONFERENCE 136
UNDERSTANDING THE ROLE OF CODECS 139
IMPROVING VIDEO PERFORMANCE WITH ISDN 144
FROM HERE... 147

Chapter 8 **Application Sharing and File Transfer** 149
APPLICATION SHARING EXPLAINED 150
SETTING UP APPLICATION SHARING 152
WHEN TO COLLABORATE AND WHEN TO WORK ALONE 158
EXPERIMENTING WITH APPLICATION SHARING 160
SHARING THE CLIPBOARD 164
FILE TRANSFER 165
FROM HERE... 170

Part III NetMeeting in the Business World

Chapter 9 **Hosting a Group Conference** 173
UNDERSTANDING MULTIPOINT CONFERENCING 174
PLANNING A MULTIPOINT MEETING 177
HOSTING A MEETING 180
BUSINESS USES OF MULTIPARTY MEETINGS 185
THIRD-PARTY PRODUCTS 186
FROM HERE... 188

Chapter 10 **Considering Security** 189
UNDERSTANDING NETMEETING'S SECURITY 190
MAKING YOUR NETMEETING SESSION SECURE 191
UTILIZING NETWORK SECURITY 192
UNDERSTANDING ONLINE SAFETY 193
FROM HERE... 196

SAMSUNG EXHIBIT 1017, Page 9

Chapter 11 **Configuring Corporate Firewalls** 199
Recognizing NetMeeting's Limitations on Corporate Networks 200
Understanding Permissions and Other Network Concerns 203
Tracing NetMeeting's Path Through a Firewall 205
Understanding the Limitations of Proxy Servers 206
Using NetMeeting on a Corporate Network 207
From Here... 207

Chapter 12 **NetMeeting as Part of Your Network** 209
Incorporating NetMeeting 210
Enhancing Your Conference Calls 213
Using NetMeeting from a Home Office 215
Using the ILS to Create a Community 216
From Here... 217

Chapter 13 **Setting Up Your Own NetMeeting Place** 219
Installing Your Own Corporate Internet Locator Server 220
Configuring Your ILS 227
Administering Your ILS 234
From Here... 237

Chapter 14 **Programming the NetMeeting SDK** 239
Introduction to ActiveX 240
The NetMeeting ActiveX Control 243
Conferencing Example 253
From Here... 262

Part IV Troubleshooting NetMeeting

Chapter 15 **Troubleshooting Audio** 267
Solving General Audio Problems 269

SAMSUNG EXHIBIT 1017, Page 10

SOLVING PROBLEMS WITH FULL-DUPLEX OPERATION 273
FIXING POOR AUDIO QUALITY 276
FROM HERE... 279

Chapter 16 **Troubleshooting Video** 281
SOLVING GENERAL VIDEO PROBLEMS 282
VIDEO CONFIGURATION OPTIONS 282
PERFORMANCE ISSUES 286
FROM HERE... 289

Chapter 17 **General Troubleshooting Techniques** 291
TROUBLESHOOTING 101 292
COMMON PROBLEMS, QUESTIONS, AND ISSUES 295
CONNECTING TO THE ILS AND OTHER NETWORKING PROBLEMS 298
DIALING AND CONNECTING 301
APPLICATION SHARING 304
FILE TRANSFER 307
TROUBLESHOOTING THE WHITEBOARD 308
FROM HERE... 309

Part V NetMeeting Resources

Chapter 18 **Products That Extend NetMeeting** 313
NETMEETING ONLINE SUPPORT 314
PRODUCTS FOR EVERYDAY NETMEETING USERS 318
CORPORATE NETMEETING PRODUCTS 323
FROM HERE... 327

Chapter 19 **Frequently Asked Questions** 329
GENERAL QUESTIONS 329
NETWORK QUESTIONS 334

SAMSUNG EXHIBIT 1017, Page 11

MAKING AND RECEIVING CALLS 335
USING AUDIO AND VIDEO 339
SHARING AND OTHER FEATURES 341
FROM HERE... 342

Appendixes

Appendix A **Glossary** 343

Appendix B **Additional Online Information** 351
RESOURCES ON THE INTERNET 351
USEFUL PROGRAMS AND UTILITIES 353
COMPANIES OF INTEREST 353
VIDEO CAPTURE HARDWARE 354
ONLINE DOCUMENTATION 355

Index 357

SAMSUNG EXHIBIT 1017, Page 12

Acknowledgments

Participating in the creation of this book was a lot more involved than I figured it would be, but I must say that it was an incredible learning experience. It was fun too! This book took a lot of work and patience from most of the people involved. It was incredible to work with so many talented people and see this project come together.

Writing a book about NetMeeting was a special challenge because it is a new type of application that has not really been written about. There are so many features and so many technologies that come together at once to make this software magic happen. On top of that, there was a major release of NetMeeting during the development of this book, which required some parts of the book to be rewritten. This created a lot of extra work for everyone, but in the end, we worked together and created a great book about this dynamic product. There are a lot of people that I would like to acknowledge for their hard work on this project.

First off, I would like to thank all of the editorial and development people at Microsoft Press and LightSpeed Publishing who made this book a reality. David Clark, Maureen Zimmerman, Joel Fugazzotto, and Scott Calamar were central in these efforts. Of course I cannot forget Christopher Booher, who made sure that this project got off the ground and introduced me to the world of publishing. Robert Scoble was a major contributor and guru for several of the chapters. At the last minute, Brent Ethington (NetMeeting Product Manager), joined the team and did a wonderful job as technical editor on top of his normally heavy work load—thanks a lot, Brent. There were many other people who worked on the book in the background, and they deserve the most credit.

I would like to thank all of my mentors. Without their guidance and wisdom, I would never have gained the knowledge required to write this book or be where I am today. Special thanks to my dad, Gregg, who has always fed my hungry mind with books and advice. Then there are all of my friends who have supported me through all the crazy times (Aye Hab, Moles, Mims, and Jwr!).

Last but not least, I want to thank and congratulate the NetMeeting development team for putting together a fabulous product.

SAMSUNG EXHIBIT 1017, Page 13

Introduction

Bombarding us with information and new technology every day, the explosion of electronic commerce and communications never seems to end. The Internet is growing, communications are accelerating, computers are becoming cheaper, and the entire world is getting wired. Microsoft is a huge part of all these areas. Microsoft NetMeeting is a software tool that brings many of the most complex computer processes together for you to use in an easy manner, whether for personal reasons or as part of a corporate network environment.

To most people, being in cyberspace means browsing the Web and sending email. This is generally true because these are the most widely adapted applications used on the Internet and intranets. Well, move over Web browser, there is a new kid in town, and its name is Microsoft NetMeeting.

A new way of communicating and interacting with others is now available through the software magic of this new product. Magic is an important concept with this new tool, because a lot of what it does seems as if a sorcerer is working on your computer—it's that helpful. What other device can transport you and your surroundings to anywhere in the world in a microsecond? What other device can let you make free long-distance phone calls to anywhere in the world? What other device can save your company money by replacing the need for travel?

WHAT IS NETMEETING?

The answer to this question is in the name *net meeting*. Microsoft NetMeeting is a software tool that enables you to meet with others on a network. That network can be a closed corporate network or the public Internet. Either way, you can meet one or more other people and use the many conferencing features that are offered by the software. When meeting online, you create a virtual environment where you and the other members of the virtual conference can communicate, collaborate, and interact in real time.

SAMSUNG EXHIBIT 1017, Page 14

Though it may not mean much to you right now, NetMeeting does all of this using industry standards that allow for other communications hardware and software to work with NetMeeting. This is perhaps one of the most important aspects of NetMeeting because by following standards there is more possibility for widespread adoption. Standards are the cornerstone of communications. As communication software, NetMeeting uses the latest industry-supported protocols to implement all of its features.

NetMeeting is part of the Microsoft Internet Explorer family and is included with Microsoft Windows 95 or Microsoft Windows NT. Internet Explorer and NetMeeting are included with this book on the companion CD-ROM. Though the software is free, you may have to upgrade or add components to your computer to take advantage of some of the more advanced features, such as live video conferencing, which requires video capture hardware.

WHO NEEDS THIS BOOK?

Almost anyone with a computer running Windows 95 or Windows NT should read this book. There is information for the individual, the network administrator, the Web developer, and the programmer. It covers all aspects of Microsoft NetMeeting that will help you use your computer to communicate in new ways with your family, friends, and colleagues. With this book, you can easily walk through the details of how NetMeeting works, starting with installation and configuration, progressing to operation and usage, and concluding with optimization. The details of how your computer performs the magic that makes NetMeeting possible are also covered.

For the Individual

Learn how to turn your home computer into a communications tool that will let you talk with your friends and family over the Internet. With the right configuration, you will be able to carry on a conversation and see the people that you care about no matter where they are in the world. You can do this without incurring any long-distance charges by using the Internet as your communication pipeline. This book provides all the information you need to use the software and configure your hardware to accomplish this task. If you have an interest in learning about computer telephony or video conferencing, then you will not be disappointed by the material that is presented in the chapters of this book.

For the Network Administrator

All network administrators need to evaluate and analyze any application that is used on their network. NetMeeting is no exception to this rule, and in fact, there

SAMSUNG EXHIBIT 1017, Page 15

are many components of NetMeeting that must be analyzed before it can be used on the network. Bandwidth is a big issue on any network, and NetMeeting can take plenty of it. There are server components of NetMeeting and firewall issues that must be dealt with. All of these areas and more are covered in the business section of this book. This is an invaluable resource for getting the information you need to develop a strategy for implementing NetMeeting on your network.

For the Web Developer

Creating a live community is the next wave of the Internet. Web users will be turning to live communication and interactive applications to make the Internet an even richer virtual environment. NetMeeting is part of this new interactive environment, and if you are a Web developer, you need to know how to create and maintain interactive directories and communities to sustain your audience. Find out everything you need to know, from creating IITML listings of users to embedding ActiveX controls into your Web pages. Don't get left behind; learn about NetMeeting and embrace its technology to take your online presence to the next level.

For the Programmer

A great deal of work has been done by Microsoft, Intel, and Databeam to create this standards-based conferencing application. Beyond providing the application free of charge, Microsoft has created a *Software Development Kit (SDK)* for software developers who want to build their own applications that are compatible with NetMeeting. You can create an application that takes advantage of any of the many features of this incredible program. This book covers both the ActiveX environment using Visual Basic, Word, and Excel, and the COM object interface. If these are new programming interfaces for you, don't worry; the examples help you learn how to build exciting state-of-the art communication applications.

USING NETMEETING'S FEATURES

There are six major features of NetMeeting that allow the exchange of different types of information between two or more computers. These features are Chat, Whiteboard, file transfer, application sharing, audio conferencing, and video conferencing. An important feature of NetMeeting is its user interface. Microsoft has managed to integrate all of these communication methods into one interface that follows the Internet Explorer style. This provides great consistency and lets you focus on learning how NetMeeting works instead of how to work it.

All of the following features are described in detail in specific sections of this book. You can turn to any of these sections at any time if you get lost while

SAMSUNG EXHIBIT 1017, Page 16

working with NetMeeting. Here is a basic description of each of the major features of NetMeeting.

Chat

If you have ever used a chat room, you should be familiar with this feature, which enables you to send text to the other members of a conference. Each line of text that you type is preceded by your name so that the text is identified as your statement to others. This was the first type of interactive online communication made available, and it still exists in NetMeeting. You can read more about this feature in Chapter 5, "Chat and Whiteboard."

Whiteboard

This feature is a digital representation of an ordinary whiteboard or dry-erase board that you may use at your office or home. Think of it as a multilayered canvas upon which everyone may draw and write. You can draw with a pen, create lines and shapes, send images, enter text, and use many other capabilities that make it a good collaboration tool for a number of applications. For instance, engineers can collaborate on technical drawings, doctors can look at X rays, and anyone can simply have fun with it. You can read more about this feature in Chapter 5, "Chat and Whiteboard."

Transferring Files

One of the simpler features is the capability to send and receive files. With this feature, you can send any file that is on your local computer or network to the participants of the conference. You also can receive a file sent by a member of the conference and save it to your local disk or network. You can read more about this feature in Chapter 8, "Application Sharing and File Transfer."

Sharing Applications

Most people have no idea what application sharing is. There is a good reason for this: it is a new capability in the world of Windows. Application sharing enables you to select an application on your desktop to share with other people who are in a conference with you. This allows the participants of the conference to see and interact with the application. You can share Microsoft Word and everyone will get a visual copy of your version of Word on their desktops. Beyond that, they also can press the buttons, change the text, and do anything that you can do on your computer. This is great if you are collaborating on a document with other people. Any Windows application, including the entire Windows desktop, can be shared.

SAMSUNG EXHIBIT 1017, Page 17

Audio

Exactly as implied, the audio feature exchanges digital audio with the remote party. The audio and video features work only between two participants, so you cannot have a three-way call. The audio feature also can be called *computer telephony*, because it turns your computer into a telephone. In many cases, the quality of a phone call on the Internet can be as good as an ordinary phone call, but there are many conditions that can interfere with this. The greatest benefit is that you are able to communicate with another user anywhere in the world using NetMeeting, by simply connecting to your local Internet service. It adds a compelling element to the entire NetMeeting package. Chapter 6, "Working with Audio," covers all aspects of using the audio features of NetMeeting.

Video

The most complex feature of NetMeeting is its video conferencing capability, which is discussed in Chapter 7, "Video Conferencing." *Video conferencing* is the capacity to exchange live video between two sites. In this case, you use your computer to capture, play back, send, and receive live digital video. It is the most complex feature because of the volume of information involved with digital video. At the same time, it is one of the most fun and exciting components of the program. It enables you to see the person you are collaborating with. There is no substitute for interacting visually with the other party on your computer screen.

How to Use This Book

This book is organized in a manner that is easy for you to use; it's divided into five parts. The subject matter increases in difficulty as you go through the chapters consecutively. Each chapter, too, is designed to increase in complexity as you proceed through it. There are many concepts that you can explore if you are new to online communications. More advanced users will find it easy to go straight to the heart of what they need to learn by directly jumping to those chapters containing their topics of interest. The five sections of this book are as follows:

Part One—Getting Started with NetMeeting

Learn how to prepare your computer for NetMeeting and how to install NetMeeting. Basic concepts are covered and this section is strongly suggested for beginning users. If NetMeeting is already installed and you have already placed a call with it, you may choose to skip this section. Chapter 4 is good for learning how to get connected with other NetMeeting users.

SAMSUNG EXHIBIT 1017, Page 18

Part Two—Using NetMeeting's Features

This part of the book goes through all the details of NetMeeting's features so that you can understand how to take advantage of them and use them efficiently and effectively. Topics in this part include Chat, Whiteboard, audio conferencing, video conferencing, application sharing, and file transfer.

Part Three—NetMeeting in the Business World

If you plan to implement NetMeeting on your network, this section is your guide to security and configuration. You'll also learn how to develop applications using the NetMeeting Software Development Kit and how to set up your own virtual community on your corporate network.

Part Four—Troubleshooting NetMeeting

NetMeeting uses some of the most advanced devices available for your personal computer, and, as you probably know, if anything can go wrong, it will. This section of the book is dedicated to helping you solve any problems with setting up or using NetMeeting. Chapter 17, "General Troubleshooting Techniques," goes through some basic methods for tracking down and solving common problems.

Part Five—NetMeeting Resources

There are many companion products and companies that offer services for NetMeeting. This part covers some of these products and how you can find out more about them. Included is Chapter 19, "Frequently Asked Questions," which is especially helpful if you want to look up a a specific problem you are experiencing.

Appendixes

This part contains the glossary and guides you to additional information that you can find on the Internet. If you don't remember a term, or if you need additional help, check one of the chapters in the last part of the book for assistance.

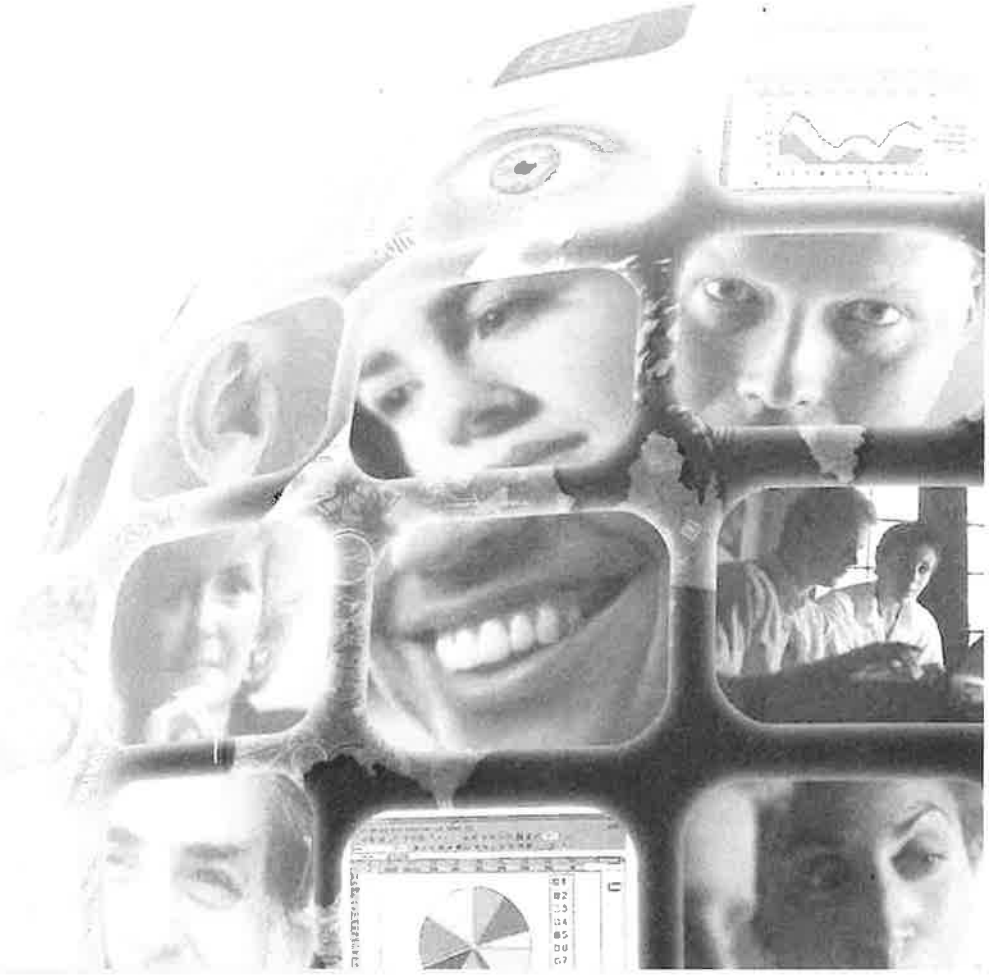
TIP

Appendix A contains a glossary that can be helpful as you read through the many acronyms and computer terms in the text. This glossary will become your invaluable guide to all the tech talk that revolves around NetMeeting.

SAMSUNG EXHIBIT 1017, Page 19

Part I

GETTING STARTED WITH NETMEETING



Chapter 1

NetMeeting Overview

In this chapter, you will learn:

- **A bushel of things you'll need to know to use NetMeeting effectively**. You'll find an overview of NetMeeting and learn why it's seen as the best of the new breed of teleconferencing applications.
- **Networking basics to help you get started with NetMeeting**. Since NetMeeting works best over the Internet, you'll need to learn a little bit about TCP/IP, which is the "language" of the Internet.
- **An overview of Windows skills you'll need to use NetMeeting effectively**. If using the Windows operating system is like skiing, NetMeeting is like an intermediate slope. Learn how to get off the tow rope.
- **The history of teleconferencing, groupware, and data-conferencing**. By learning where the industry has been, you'll gain insights into where it's going, and also learn some of the history behind NetMeeting's features.
- **How NetMeeting compares to your traditional telephone**. Don't compare NetMeeting to a 100-year-old technology. It's both better and worse than your plain old telephone, and I'll tell you why.

SAMSUNG EXHIBIT 1017, Page 21

NetMeeting is a new kind of application—one that provides something better than the telephone, fax machine, and old-style videoconferencing hardware all in one shot.

For several decades, the best way to talk with your friends or work remotely with your co-workers was to call them on the phone. In the 1980s, fax machines came along, allowing you to send drawings, documents, and other two-dimensional media. The first corporate videoconferencing systems were also introduced in the eighties. Your company might even have had a videoconferencing room or two, but you certainly couldn't get one of those systems on your desk. Most likely, your use of that technology was limited to rare occasions, like calling the president of your company.

But even with all that whiz-bang technology, you couldn't actually collaborate with other people from your desktop computer. What do I mean by that? Let's say we're working on a project together. Without NetMeeting, I would have to fax my PowerPoint slides to you, you'd have to make changes to them, and send the changes back. Then I'd need to input those changes and fax them back again. If I wanted to talk with you face to face, we'd have to wait in line for our corporate videoconferencing room (not to mention justifying the use of the ultra-expensive system).

NetMeeting changes all that: now you simply call your friend (easy to do, just double-click on her name), turn on application sharing and collaboration (two mouse clicks), and both of you can work together on the same document.

But wait, there's more. While you are working together on the document, you can also talk to each other. Not on the telephone, but via the Internet (or over your company's intranet), using your computer. Why is that important? By using the Internet instead of the telephone, you can save a lot of money on long distance calls, and possibly even make them for free. You can add video capability to your call by spending less than $300 on video capture hardware. It is in this way that someone can see and hear you.

Wait a minute, did you say "free videophone calls anywhere in the world?" I certainly did. Here's how:

Instead of using your telephone to call around the world (which can cost lots of money), you can use the Internet. In most locations in the U.S., it only costs $20 per month to get access to the Internet through a service like the Microsoft Network (http://www.msn.com).

Once you connect to the Internet, there's no additional cost to use it, even if you are talking with someone in South Africa. Since you are not charged for the amount of data you send on the Internet, or even how far the data is going, you can use the Internet as much as you want and it will not cost you a penny beyond your basic subscription cost. When using NetMeeting to place a phone call, you can take advantage of the nonmetered Internet to place your calls

SAMSUNG EXHIBIT 1017, Page 22

anywhere in the world for free. While cheap phone calls are great, the power of NetMeeting is that it lets you do something your phone doesn't—see the other person you are communicating with, and share data at the same time.

WHAT YOU NEED TO KNOW TO USE NETMEETING EFFECTIVELY

Microsoft NetMeeting was called one of the best new products of 1996. It was praised by the press in 1997 as the top conferencing and collaboration tool on the market. However, the technology behind NetMeeting isn't that new. Video conferencing systems that use computers have been around for years. Many products are built on technology similar to NetMeeting's Whiteboard. There are other products that let you remotely control shared applications (a few of which were out before 1990) and text chat has been used, it seems, since the beginnings of the Internet.

What's so unique about NetMeeting? It's the first time that video conferencing, application sharing, file transfer, whiteboard, and chat have been brought together into one easy-to-use application that supports international communication and collaboration standards, rather than proprietary protocols. (Figure 1-1 shows the NetMeeting user interface.) In addition, NetMeeting offers developers application programming interfaces for integration into their existing applications, and is included as part of a major operating system. (NetMeeting 1.0 was included with versions of Windows 95 and Windows NT released in late 1995. Version 2.0 was released in April, 1997 and was included with the full version of Internet Explorer 4.0. Version 2.1 was released at the end of 1997. This book covers version 2.1, since that's the latest released version.



Figure 1-1. *NetMeeting combines all the conferencing tools you need to meet and collaborate online.*

SAMSUNG EXHIBIT 1017, Page 23

If you have experience with other conferencing applications, you will find that NetMeeting is easier to use than what you are accustomed to. Most of the complexity has been hidden so that you can use the application more efficiently. Though some of the features may seem overwhelming at first, this book was designed to help you through any difficulties. Since networking, and the Internet in particular, is critical to the operation of NetMeeting, it's important to understand some operating system and networking basics. If you're an experienced Windows and Internet user, you might just skim this chapter, or maybe skip it altogether.

Windows Basics

To get the most out of this book, you'll need solid Windows 95 or Windows NT 4.0 skills. You should be able to use the mouse to open, close, print, minimize, and maximize applications. You should know most of the standard terms that apply to the user interface of Windows 95 and NT (for instance, that the taskbar is the bar along the bottom of your screen that shows which applications are running).

You should be familiar with the help systems included with Windows 95/NT or with an application like Microsoft Word, so if you get lost you'll be able to get some assistance without completely losing your sanity. (To find Windows' help, use the Start menu and select Help.) Even advanced users are well served by occasionally going through the online help and trying to learn some new tips. I haven't found anyone (even Bill Gates) who knows everything about the Windows operating system and how to best use it. The more comfortable you are with Windows, the more quickly you'll integrate NetMeeting into your life, especially if you've looked at the following Windows Control Panel devices: Multimedia, Sounds, Networking, Modems, and System.

Oh, one other thing, you should be a pretty decent Web surfer by now, and you should know Web browser basics, like how to use a URL (Universal Resource Locator) to go to a specific Website. A URL is an address that typically looks like this: http://www.netmeet.net. I've found that the more you use the Internet, the more likely you'll appreciate the advantages of NetMeeting. And, of course, to be a good Web surfer, you'll need to get on the Internet. So, the next section covers the basics of Windows networking. (You can skip it if you're already familiar with TCP/IP.)

Networking Basics

To use NetMeeting, your computer must be able to communicate with another computer at a remote location. That other computer can be your boss's computer just down the hall, or it can be a relative's computer in a distant country.

SAMSUNG EXHIBIT 1017, Page 24

In the same way that you need to know the phone number of the person you are trying to call with your traditional telephone, you'll need to know how to call someone with NetMeeting. I've found that it really helps to have a basic understanding of the networking technology used by NetMeeting.

Let's assume, for a moment, that you'd like to use NetMeeting over the Internet or a TCP/IP-based network. I like to think of the Internet as a bunch of wires that connect potentially every computer in the world with a common language that they all can understand. Now, I know that's oversimplifying it a bit. The Internet doesn't have a "language," but a set of protocols, which are called Internet Protocols (IP). The most widely used protocol in the IP family is TCP/IP. This protocol guarantees that information sent on the network will be received. There are other protocols that do not have this characteristic. NetMeeting uses both of these types of protocols, but most of its functions are implemented using TCP/IP.

Think of TCP/IP (Transmission Control Protocol/Internet Protocol) as the "Internet Language." A good analogy for understanding how the Internet works is to compare it with the postal system. In both cases, people or computers are receiving and sending packages, letters, or data. The postal system uses return and destination street address information to determine where the letter is coming from and going to. Similarly, on the Internet, every computer is assigned an address so that data being sent has return and destination information. This computer address is known as an IP address (pronounced "eye-pea").

If I want to call you using NetMeeting from my computer in Blacksburg, Virginia, NetMeeting needs to know your computer's IP address. As I will show you in Chapter 4, there are a number of ways to establish a connection with NetMeeting, but at the foundation, the IP address is always needed. In most cases, the computer will look up the IP address for you. So don't worry about having to memorize the IP addresses of all your friends and colleagues. And, as you will learn, the address can change every time you connect to the Internet. If you don't know your IP number, you can find it out by holding down the Start menu button in Windows 95, selecting Run, typing "winipcfg," and pressing the Enter key. NT4 users will have to run a console-based application called IPCONFIG.EXE. A small application should come up to give you your IP address. (see Figure 1-2).

NOTE

You must be connected to the Internet or other network before you run this utility.

SAMSUNG EXHIBIT 1017, Page 25

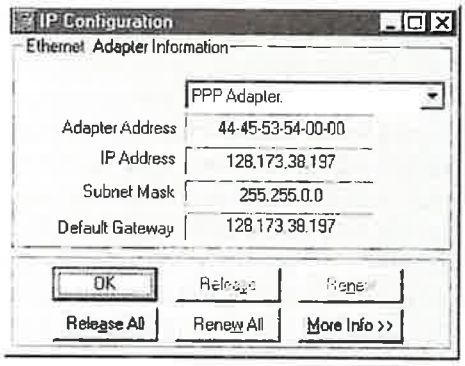


Figure 1-2. *The WINIPCFG.EXE application shows your current IP address, along with other networking information.*

An IP address has four sets of numbers separated by periods (more commonly called "dots" by Internet users) like this: 207.68.137.59. This dotted decimal format uniquely identifies your computer on the Internet. Another form of the address is the host address, which is easier for people to use because it is in the language of people, not of computers. The host address for the dotted decimal IP address given above is microsoft.com. It is much easier to remember microsoft.com than 207.68.137.59.

One difficulty encountered by some NetMeeting users is when they, or the person they're trying to call, doesn't have the same IP address every time they log on. An IP address that doesn't change is called a static IP address, in networking lingo. A changing IP address is referred to as a dynamic IP address. Dynamic addressing is the most common form on the Internet. If you are using any of the commercial Internet service providers (ISP), you have a dynamic IP address. It is easy to see the address change by running the WINIPCFG utility (mentioned earlier) each time you connect to your ISP.

So how can NetMeeting call your computer if your IP address changes every time you connect to the Internet? The answer to this question lies in the Internet Locator Server, which is covered in Chapter 4.

However, not every NetMeeting user is on the Internet. Some users will be behind a firewall that effectively shuts them off from the Internet, which means they'll need to set up NetMeeting to get through a firewall (see Chapter 11 for firewall issues).

TELECONFERENCING EXPLAINED

Prior to 1995, you needed to buy a lot of expensive equipment to send video and audio through a computer. The processors of that era (386 and 486 chips) couldn't perform math quickly enough to compress both the audio and video to

SAMSUNG EXHIBIT 1017, Page 26

go over slow modems. So video and teleconferencing vendors built add-on hardware to compress the audio and video. (Teleconferencing refers to the use of computers to communicate using voice and/or video.)

The best known of the traditional teleconferencing vendors is PictureTel (which developed some of the technology underlying NetMeeting). If you wanted to teleconference, you needed to buy a PictureTel board for each system (even today most of PictureTel's boards cost more than $1,000 each). That became real expensive real quickly, and there was no way you could talk with your boss if he or she didn't have a PictureTel board.

By 1996 Pentiums were abundant and affordable. You could buy a 28.8 Kbps modem for less than $200 (now they are close to $50). Finally, the typical system was capable of sending audio and video over a modem without requiring proprietary, expensive, hardware. The desktop video conferencing industry was born.

NetMeeting wasn't the first teleconferencing software in this industry, by the way. The first one was CU-SeeMe, which was developed at Cornell University (hence the "CU"). However, CU-SeeMe was hard to use, used proprietary protocols, and didn't have application sharing, which has proven to be NetMeeting's "killer feature". (A killer feature is one that gets lots of people to use a particular product. Many people remember Aldus PageMaker—now Adobe PageMaker—as a "killer app" for the Macintosh.) CU-SeeMe was popular (and remains so) because it has the ability to hook several CU-SeeMe users together and also because it was way ahead of the rest of the market.

As the year progressed, the market split into several distinct categories. First the audio-only Internet telephones emerged (Vocaltec's Internet Phone and Freetel are two examples). Then came the videophones (like Connectix' Video Phone, or VDOnet's VDOPhone) which featured audio and video, but didn't have many other features.

Then along came collaborative, or groupware, tools like NetMeeting, which included audio and video with a whiteboard, application sharing, text chat, and more.

Groupware and Dataconferencing

Microsoft calls NetMeeting a real-time "dataconferencing" tool, which means that it was originally aimed squarely at the corporate market, while the other products were aimed at the then-seemingly larger home market. Microsoft coined the term dataconferencing to mean applications that share data between computers. In reality, NetMeeting also fits into the Internet Conferencing category because it enables real-time multimedia communications between two or more people across the Internet or intranet.

Whatever you call NetMeeting, if you get nothing else out of this book, you'll learn that NetMeeting will change the way you look at your computer.

SAMSUNG EXHIBIT 1017, Page 27

You're no longer an island when you work on your computer. You can call your colleagues with NetMeeting, share a spreadsheet with them, see them, talk to them, chat with them, collaborate with them—all from your computer.

However, don't get too caught up in the dataconferencing hype yet. There are some things that NetMeeting does well, and some things it doesn't. It takes a lot of technology to get your voice into your friend's computer. Let's talk about what you should expect from a conferencing tool like NetMeeting.

Quality Tradeoffs over Traditional Telephone Lines

Is the NetMeeting glass half full or half empty?

We've become spoiled by a technology that's almost one hundred years old—the telephone (and to a lesser extent, TV as well). We expect to pick up our telephone, dial a few numbers, and instantly talk with anyone in the world. We're incredulous if there's even a faint amount of static on the line.

NetMeeting isn't perfect, and it shouldn't be compared directly to your telephone, or your television (at least, not yet). Every tool has its use and purpose. It is important to know the limitations of each tool so we can use the best one to accomplish the appropriate task. NetMeeting has a lot of great features, but it is not the solution for everyone or everything. However, it does perform some tasks that no other tool can. Helping you to learn when to use NetMeeting and when to use other technologies is what this section is for. With that goal in mind, I've put together a pessimist's view and an optimist's view of NetMeeting.

The "NetMeeting's glass is half-empty" view (limitations to NetMeeting's audio and video):

- There's a delay in your voice.
- The audio often isn't full-duplex, which means only one person can speak at one time.
- The audio often crackles, or pauses, and an occasional word or two disappears.
- The video is small, fuzzy, and movement is jerky.
- Getting NetMeeting to work sometimes can be frustrating, to say the least.

All of these claims are true, at least to some extent. They are certainly less of a problem on modern machines (video on a new 200-MHz MMX machine, for example, works quite a bit better than it does on an older Pentium 90). The quality of your experience will directly correspond to the quality of your equipment. You will also find that the NetMeeting experience is quite incredible considering everything that the program is doing. The ability to see and talk to friends, fam-

SAMSUNG EXHIBIT 1017, Page 28

ily, and colleagues over the Internet is amazing, even if the audio does break up on occasion.

However, even on the fastest machines using ISDN lines, the quality of audio isn't quite as good as the telephone (it's really close, however, on a top-of-the-line machine) and the video certainly can't touch the video quality you'll see on the least expensive home television. Keep in mind that if you are using the Internet, you are sharing resources with everyone else who is using it, too.

Which brings us to the "NetMeeting's glass is half-full" view. These features are unique to NetMeeting:

- NetMeeting users can talk, send video, type text, and share applications all at the same time. Try doing any of that with even the most expensive phones!
- NetMeeting users can collaborate on a whiteboard with pictures, text, and drawings.
- NetMeeting users can transfer files between each other (or transfer documents without printing them out).
- NetMeeting users can call anywhere in the world for the price of a local call.

In general, use the telephone when speed and quality of voice-based communication is absolutely necessary, and use NetMeeting when you don't want to pay long distance fees, or when you want to collaborate on a project, a document, or an application.

In fact, the outline of this book (and several of the chapters) was done with both NetMeeting and a "plain old" telephone. Sometimes I used both NetMeeting (for application sharing, video, or Whiteboard) and the plain old telephone because I needed better sound quality than NetMeeting could provide. It is important to realize that you can use both at the same time, provided you have an extra phone line. Audio is the only feature of NetMeeting that overlaps with any other service you have and, in general, is the most often criticized.

Also, you'll find that if you try to use audio, video, application sharing, and the Whiteboard at the same time on a 28.8 Kbps modem, the quality will deteriorate quite a bit because there just isn't enough bandwidth for all that data. The available bandwidth on the Internet also plays an important role in the quality of your conference. I cover bandwidth in more detail in Chapters 6 and 7.

You'll want to compare NetMeeting to other technologies, and there are a lot of new terms that the fledgling teleconferencing industry is throwing at everyone, like CODEC, POTS, H.323, and so forth. To help you cope with all of the

SAMSUNG EXHIBIT 1017, Page 29

lingo, I've put together a few of the key terms that you'll see in this book and on the Internet.

Teleconferencing Lingo

Audio is a large component of NetMeeting. It provides the first opportunity for many people to use their computer's sound capabilities to do "useful" work, so that's why so much of teleconferencing's lingo concerns audio.

For instance, one of the options in NetMeeting is "full-duplex audio" (see Figure 1-3). Full-duplex audio means that you can talk while someone is talking with you (like a regular telephone).

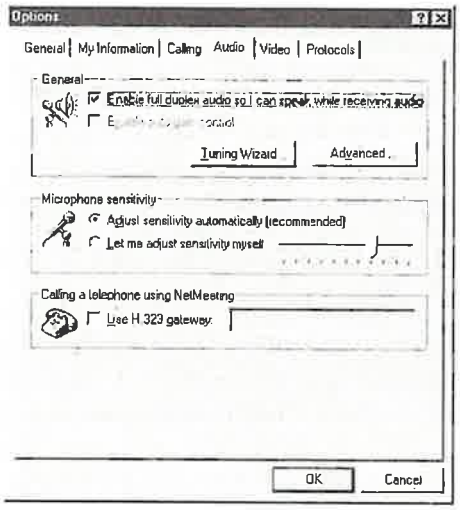


Figure 1-3. *NetMeeting lets you choose half-duplex (CB radio-like) or full-duplex (more like your telephone), but you need to have a sound card that supports full-duplex.*

In "half-duplex" mode, you might think you are using a CB (Citizens Band) radio. Those radios, which were popularized in the 1970s, also use half-duplex. That means you can't transmit speech until the party you are communicating with stops talking.

That technique frustrates many people, because they are used to the telephone, which works in full-duplex mode. (Like CB users, NetMeeting users often say "over," to let the other person know they're done talking.)

If you can use full-duplex with NetMeeting (we'll discuss that more in Chapter 6), you'll find another problem—echoing. Echoing happens when your voice comes out of your friend's speakers, and feeds back into her microphone. It can be frustrating because you can hear yourself a second after you've said something. (Think of those radio talk show hosts who tell their listeners to turn

SAMSUNG EXHIBIT 1017, Page 30

down their radio. Same problem.) A good set of echo-canceling headphones will do the trick (I also discuss headphones in Chapter 6).

Any discussion of videoconferencing includes a lot of numbers. There's H.323, H.324, H.320, and a whole slew of other numbers that are representative of the various standards in the industry.

Don't lose too much sleep over them. The most common numbers you'll need to know today are H.323 and T.120. NetMeeting is a H.323-compliant videophone, which means that it can call any videophone that also is H.323. (PictureTel's LiveShare, Smith Micro's AudioVision, Microsoft's NetMeeting, and Intel's VideoPhone are the four I know about at press time.)

If you find a videophone that's designed to meet H.323 specs, that means that it will work properly on LANs and on the Internet. The spec itself tells the programmers who wrote NetMeeting how to make the audio and video work, so that you can call other NetMeeting users, or any other H.323 users. H.323 is a great advance for the video conferencing industry because it will ultimately mean that all videophones will be able to work with each other.

Why is that important? Think about what would have happened to the telephone industry if Panasonic telephones couldn't call Sony phones. Buying the wrong telephone would have limited you to calling only a few people, instead of everyone in the world. (Think of Betamax vs. VHS videotapes.) H.323 will bring the same interoperability to your computer.

The T.120 spec covers the data conferencing technologies in NetMeeting, like file transfer and application sharing. There are already several other products that can use the Whiteboard, and NetMeeting's style of application sharing, because Microsoft used industry standards for those components.

It's likely that most conferencing products designed for use on the Internet will adopt these standards, so there'll be a wide variety of other products for NetMeeting users to communicate with.

These standards basically define how the codec (the engine compressing your audio, video, and other data underneath NetMeeting) will do its job; and the details can fill complete books. It's all very important for the programmers who developed NetMeeting. However, typical NetMeeting users don't need to know much about these various numbers.

TIP

Appendix A is a glossary of the most widely used terms you'll need to know when working with NetMeeting. Take a look at the glossary before continuing, or feel free to turn to it when you don't understand a word.

SAMSUNG EXHIBIT 1017, Page 31

There are a few other new terms you'll need to learn. For instance, you'll need to use an Internet Locator Server (ILS) to call someone. The ILS (which was formerly called a ULS, or Universal Locator Server) is simply a machine that keeps track of anyone who is using NetMeeting at that time. Chapter 4 covers how to use an ILS, and Chapter 13 talks about how to set up your own ILS.

Now that you have an overview of NetMeeting, let's install it and start using our computers to communicate with the world!

FROM HERE...

Using NetMeeting might seem difficult, but it isn't any harder than using the telephone—it's just different. To make your first call, you'll need to know how to configure NetMeeting for modems or networks, how to hook up with someone else, and how to use NetMeeting's five major features: video conferencing, file transfer, application sharing, Whiteboard, and Chat.

The following chapters will get you started on your first NetMeeting:

- Chapter 2, "Preparing Your System," will get your system ready for the first NetMeeting session.
- Chapter 4, "Making your First Call," teaches you how to connect with another NetMeeting user.
- Chapter 5, "Chat and Whiteboard," shows how to use the text-based Chat and Whiteboard features of NetMeeting.
- Chapter 6, "Working with Audio," gets you gabbing over the Internet.

SAMSUNG EXHIBIT 1017, Page 32

Chapter 2

Preparing Your System

In this chapter, you will learn:

- **How to properly prepare your system for NetMeeting**. You'll find out how to tune up your system and get rid of viruses and other problems.
- **How to equip your network and/or modem for the strain of video conferencing**. Video conferencing needs lots of bandwidth for the best performance. Here are some tips for getting the most out of your connection.
- **How to set up your sound card for full-duplex, high-quality audio**. Two-way audio communication is the cornerstone of NetMeeting's feature list, so it's helpful to spend some time tuning up your audio system.
- **All about your video capture device and how to make it work the best with NetMeeting**. Video is the most demanding technology for the modern PC and can be the hardest component to set up. You'll learn step-by-step how to get your video capture device ready for NetMeeting.

SAMSUNG EXHIBIT 1017, Page 33

Setting up your system properly is the first step to successfully installing and using NetMeeting. For instance, if your microphone isn't properly adjusted, the person you are trying to communicate with may not be able to hear your voice. This chapter takes you through everything you'll need to do to get NetMeeting working right—from the moment you install it.

PREPARING YOUR SYSTEM FOR NETMEETING

Maybe you've had your computer system for a while, or maybe you just bought a new MMX machine and you're anxious to use it with NetMeeting to communicate with your friends and colleagues. As eager as you might be to get started, you'll have a much more successful NetMeeting experience if you spend some time learning about your system and tweaking a few things.

Before you install NetMeeting, let's do a step-by-step check of your system to see what is working and what needs some work.

Recommended Hardware

NetMeeting is one of the most demanding applications that you can run on your system today. So let's make sure you have the equipment to run it. Do you have at least 16 megabytes (MB) of RAM (random access memory)? You can probably get away with less, but it's really important to have enough RAM to run modern applications. NT users should have 32 MB or more.

It's helpful to have a Pentium 90 or better (133 or above is best for video). NetMeeting 2.1 is enhanced with MMX instructions, so you'll get the best quality video if you have a Pentium with the new MMX instruction set. The newest 200-MHz MMX machines will give you the best sound, video, and application sharing quality. Again, it's okay to have less, but your experience might not be what you expect, especially if you are using full-duplex audio and/or video.

To get the most out of NetMeeting you'll also need some good quality peripherals—a video card, sound card, microphone or headset, and a video capture board. We'll take a look at these components later in this chapter, but first let's focus on your hard drive and system software.

Preparing Your Hard Drive

There are several things about your hard drive and system that you need to check before you install NetMeeting:

- Is there enough free space on your hard disk?
- Are there any problems or viruses on your hard disk? Do you have the latest antivirus software?

SAMSUNG EXHIBIT 1017, Page 34

- Is the hard disk fragmented?
- What operating system are you running? Do you have the latest updates?
- Do you have a clean power supply?

You'll need adequate hard disk space to install NetMeeting. In fact, any application that you install will need a fair amount of hard disk space. NetMeeting needs about 10 MB of free disk space to load properly. If you also load the complete Internet Explorer 4 or newer, you may need more than 40 MB of free space. Check how much free space is left on your hard drive by double-clicking on My Computer, right-clicking on your C drive, and selecting Properties. The dialog box that comes up will tell you how much free space is on your hard drive and how much space is filled. See Figure 2-1.

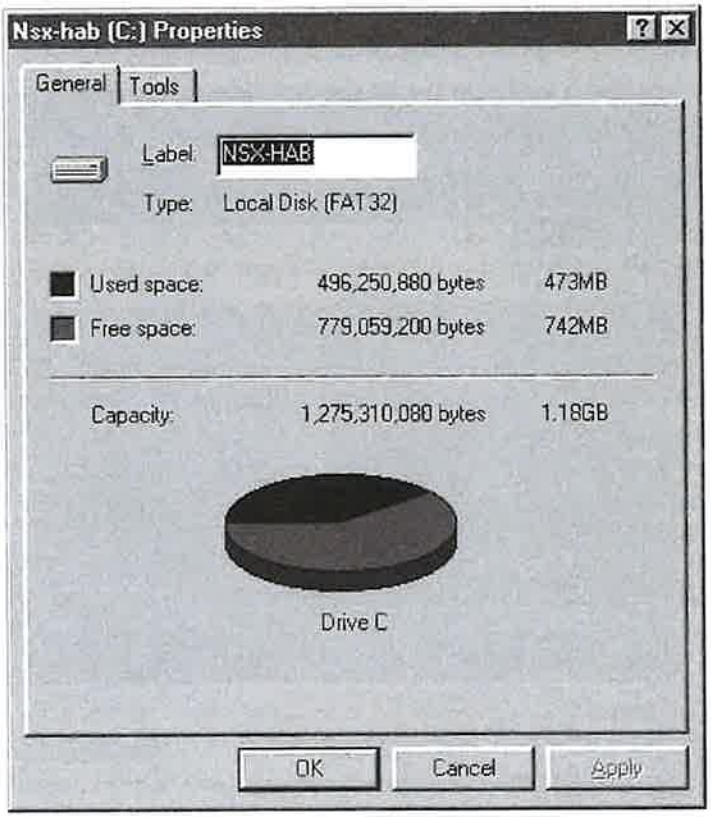


Figure 2-1. *Enough disk space? By right-clicking on your C drive and choosing Properties you can see how much space is left on your hard disk.*

SAMSUNG EXHIBIT 1017, Page 35

You'll also need free hard drive space for your swap file. The swap file is used by Windows to keep pieces of programs that won't fit into your RAM. Since the swap file needs room to grow, I recommend that you always make sure there's more than 20 MB of free space on your hard drive. (Actually, I get uncomfortable whenever there's less than 100 MB free on a disk. Since two-gigabyte hard drives are now selling for about $200, I recommend upgrading if you are getting tight on space.)

Once you've determined that there's plenty of disk space to load NetMeeting, we need to make sure there aren't any problems, fix any problems we might find, and protect your system against viruses.

To check your system for problems, you'll need to run ScanDisk. Here's how to do that: Double-click on My Computer on your desktop. Then right-click on your C drive and choose Properties. Then select the Tools tab and click Check Now. Select "Automatically fix errors" and press Start. (See Figure 2-2.) NT4 users might see a slightly different dialog box and will probably have to restart their computer to complete the process.

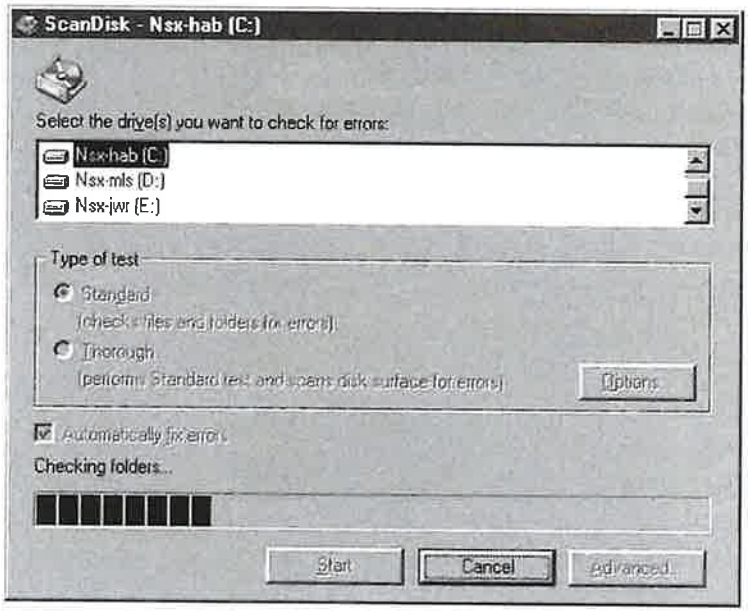


Figure 2-2. *Scan your disk for errors. By running ScanDisk, you'll ensure that there aren't any problems on your hard disk.*

ScanDisk will check your drive for any problems. If it finds problems, I recommend restarting your computer immediately after running the ScanDisk application.

If your disk came out of its checkup with flying colors, you'll want to make sure you clean out your temp folder. The temp folder is a temporary holding

SAMSUNG EXHIBIT 1017, Page 36

place for the various applications that run on your system. Usually it remains empty, but occasionally an application will leave a bad file in this directory, which is most likely located at C:\WINDOWS\TEMP\.

If there are any files in this directory, please move them to another directory on your hard drive. You'll need to do this any time your computer crashes, especially if NetMeeting is open, because NetMeeting will sometimes leave corrupted files in this directory.

Now that you've cleaned off your hard drive, we want to make sure it stays that way. Since you'll be collaborating with people on a network and sharing files with NetMeeting, you should get the latest antivirus software from one of the reputable vendors like Symantec or McAfee to make sure you don't get viruses (or spread any either—it's embarrassing to give other people viruses). I won't cover how to use virus scanners, but the subject is important enough to mention. By the way, updates for most virus scanners can be found on their Internet sites. Take a few minutes to download the latest version and at least you'll be safe from the currently known viruses.

Disk Fragmentation

Depending on how much software you've already loaded, your hard drive might be fragmented. Disk file fragmentation is a common problem, and although it won't hurt your system, it can slow it down.

Files are stored in little chunks on your hard drive. A disk becomes fragmented when one file gets randomly split up all over the place, rather than being saved as consecutive bytes. That causes your hard drive to work harder to open a single file or an application. It's easy to fix a fragmented drive, but be warned: it takes a while to defragment, and there's the (slim) potential for disaster if your power goes out or if you accidentally turn off your machine in the middle of the defragmenting procedure. I recommend defragmenting your disk only after data has been backed up.

To defragment your drive, double-click on My Computer, right-click on your C drive (or any drive you want to defragment), choose Properties, then Tools, and click on "Defragment now." Follow the directions, and when you are done, you'll probably find that your drive will be slightly faster. Believe it or not, this can help NetMeeting, especially when sharing applications with it.

NT4 does not come with a disk defragmenter, but you can get a third-party utility from Executive Software (http://www.execsoft.co.uk).

System Updates

Now it's time to make sure your system is ready for NetMeeting.

First, you'll want to be sure you're running the latest version of the operating system. Did you know that there are dozens of updates to the original version of Windows 95? If you have Windows 95 version B, some of these

SAMSUNG EXHIBIT 1017, Page 37

updates aren't needed, but they shouldn't cause any problems, so you can load them anyway.

Windows 95 B (the B version is also known as OSR2) was released in late 1996 for distribution with new PCs only (you can't buy it). You can tell if you are running the B version by opening My Computer and viewing the Help/About dialog box. If the copyright says 1981–1996, you have the B version. If it says 1981–1995, you have the original version.

A few of these updates can really improve your NetMeeting experience. Here's a list of them and where you can find them on the Web:

- **Microsoft's Free Download Page**. This page includes links to just about every free downloadable file on Microsoft's site (there are hundreds of files to download). Finding files may take a while, but we found the following pages from the links on this page.

  `http://www.microsoft.com/msdownload/`

- **Windows 95 Update for Home Users Page**. This page includes the Service Pack 1 and a few other important fixes. Everyone should load the Service Pack 1, because it fixes several memory leaks and bugs that could affect NetMeeting. (Note: Service Pack 1 isn't needed for users of version B.)

  `http://www.microsoft.com/windows95/info/updates.htm`

- **Windows 95 Advanced Updates**. This page offers several goodies, including the Kernel patch, which fixes a memory leak (a memory leak occurs when a poorly-written program uses more and more memory). There are plenty of other fixes here as well.

  `http://www.microsoft.com/windows95/info/updates.htm`

- **Microsoft Internet Explorer 4**. If you don't have the latest browser from Microsoft, you'll want to get it before you go any further. You can use it at the same time and on the same machine as Netscape Navigator. The full version of Internet Explorer 4 includes NetMeeting as part of the download. NetMeeting is a member of the Internet Explorer family and these programs have been fully integrated. You'll want to check this site occasionally for updates to Internet Explorer.

  `http://www.microsoft.com/ie/`

- **NetMeeting 2.1**. This is the official site to find the latest version of NetMeeting. You will also find the NetMeeting Software Development Kit (SDK) and Resource Kit on this site. If you installed the full version

SAMSUNG EXHIBIT 1017, Page 38

of Internet Explorer 4 when it was released in 1997 and are using the included version of NetMeeting, you do not have the latest version.

```
http://www.microsoft.com/netmeeting/
```

TIP

The enclosed CD includes both NetMeeting version 2.1 and Internet Explorer 4 to save you some download time.

- **WinZip**. Still the best of the unzip programs. This is very useful for uncompressing ZIP files that people send you during a NetMeeting session.

  ```
  http://www.winzip.com
  ```

- **Windows NT Updates**. If you're using Windows NT, you'll want the latest service pack update. (Service Pack 3.0 is the latest at press time.) Without this Service Pack, application sharing will not work properly under Windows NT. You can get the latest NT service packs at the following addresses:

  ```
  http://www.microsoft.com/ntworkstation/
  http://www.microsoft.com/ntserver/
  ```

Drivers

It's not enough to update only your operating system and NetMeeting. It's very important that you have the latest drivers for the peripherals that are included in your system. I've seen NetMeeting crash on machines with bad video card drivers, for instance, so I recommend getting the latest drivers for your peripherals, especially if your system is a few years old. You don't have to do this, but believe me, taking a few hours to track down the latest drivers can usually mean fewer problems down the road.

I have a rule—don't load drivers from floppy disks, instead always get the latest version from the product's Web site. Drivers found on the floppies that came with your product are almost always older than those you can find on the company's Web site. For instance, I recently bought a network card that was accompanied by a disk with drivers that were three months older than the drivers on the manufacturer's Web site. But, if the hardware is working fine, don't upgrade. "If it ain't broke, don't fix it."

SAMSUNG EXHIBIT 1017, Page 39

Hardware manufacturers are constantly working to improve their software drivers. Even if you have the B version of Windows 95, you'll be well served by downloading the latest drivers. On one new machine, I saw a 20 percent increase in speed just by loading the latest drivers for a Stealth 2000 video card (not to mention that the machine no longer hangs).

It's best to make a list of your modem, video card (VGA), sound card, video capture devices, monitor, and even your mouse, and visit the Web sites of each company to download the latest drivers. For NetMeeting, focus particularly on your modem, sound card, video card, and video capture devices, since all of these play a large part in your NetMeeting experience.

It's not enough to let Windows set up your devices automatically, either. Sometimes they aren't set up properly, so you'll need to check your System control panel to make sure that what you have loaded onto your machine matches what Windows says is on your machine. See Figure 2-3.

OK, now we're ready to get into the tough stuff—modems, networks, and audio and video devices.

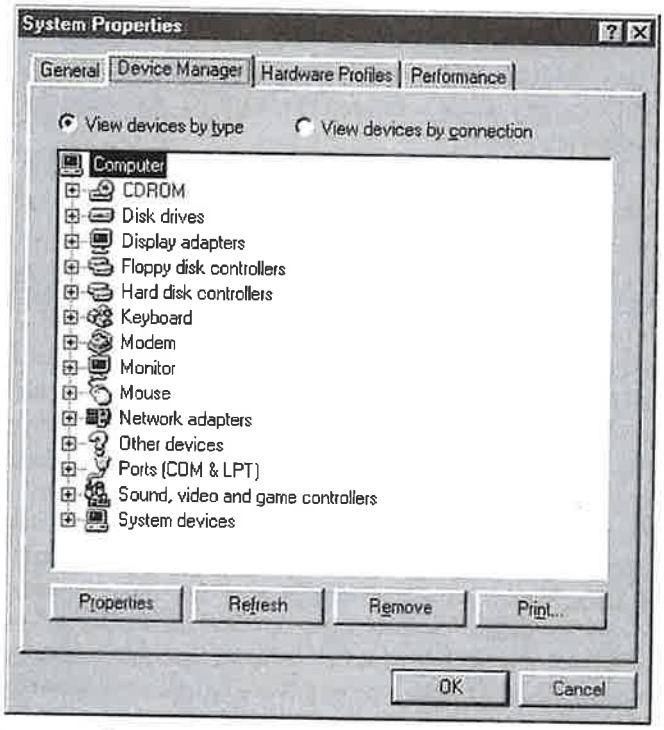


Figure 2-3. *Check up on your system. By using the System control panel, you can make sure your modem, network card, and display drivers are properly installed and working correctly.*

SAMSUNG EXHIBIT 1017, Page 40

CONNECTING YOUR COMPUTER

NetMeeting can be connected any number of ways: phone line modem, radio modem, cable modem, ISDN, satellite, or LAN, just to name a few. Each of these methods provides the same Internet service but different levels of bandwidth and even mobility, in the case of a radio modem. The key rule to remember is there is no such thing as too much bandwidth. By bandwidth, I am referring to the amount of data that can be transferred over your network at one time.

Consider the technological feat of sending video over the Internet. A 30-frame-per-second 320 x 240 resolution 24-bit color video takes about five megabytes per *second* uncompressed. Yikes! So, how are you going to get all that information through a tiny modem that can only handle 28.8 kilobits per second? (There are eight bits to a byte, which further shows the problem—we're looking at a difference between 3,600 bytes and five million bytes!) This is roughly equivalent to taking all the water in the Niagara Falls and sending it though a straw.

I just threw a lot of technical terms at you. 320 x 240 refers to the video resolution in pixels. A pixel is a dot on the screen, so that means the screen display is 320 pixels high by 240 pixels wide. 24-bit color refers to the number of colors in each image. 24-bit means that there are 16.7 million colors in each image. All of this means that video images take up a lot of space. NetMeeting uses compression to solve some of this, but video is still a very data-intensive part of NetMeeting.

You can see that it's very important to use a modem or a network that's absolutely as fast as can be. Also, since NetMeeting generally is used on the Internet, your Internet service provider (ISP) can play a huge part in all of this.

I recommended that you find an ISP that has some concern about your "quality of experience." A lot of companies will gladly take your $20 per month, but they might not provide enough modems or have enough bandwidth to support all their users. Ask your friends which ISPs they like and drop yours if its technical support or sales staff isn't helpful on the phone. (There's a list of ISPs at http://www.thelist.com, so there's no excuse for sticking with a bad one.)

Some of the better ISPs post tricks on how to get the most speed from your modem. When you are choosing an ISP, check to see whether it recommends a particular modem. (Some ISPs support the new 56 Kbps modem technology, which gives you more than 50 Kbps on downloads. But those modems still only work at 33.6 Kbps for uploads, so they won't help NetMeeting users all that much.)

While we are talking about connections, if you are on a corporate network, you may have to talk with your network administrator before you use NetMeeting. NetMeeting uses several network resources that may be restricted by your network administrator. This is usually done through a corporate firewall. Turn to Chapters 11 and 12 for information on how NetMeeting can effect your network and the details of configuring a firewall with NetMeeting. Also, your network

SAMSUNG EXHIBIT 1017, Page 41

administrator can tell you if there's any way to get more bandwidth, and she can check your network settings to ensure that everything about your machine is set up properly.

GETTING YOUR AUDIO DEVICES READY

The quality of audio contributes greatly to a successful NetMeeting session. You can conduct business without video, but if your audio disappears, you're in trouble.

So, I assume you've installed a modern SoundBlaster-compatible sound card with the latest full-duplex drivers. Chapter 6 covers full-duplex in depth. Remember, most sound cards (except for the most recent and most expensive ones) were not designed for Internet conferencing. When shopping for a sound card, you'll want to get one with true full-duplex capability and the ability to record and play back at an 8 kHz sampling rate.

Two compatible sound cards are the Creative Labs AWE32 family of SoundBlasters and the Winnov Videum AV. There are plenty of others; those tested with NetMeeting by Microsoft are listed in Chapter 18.

Many older SoundBlaster cards can be brought up to compatibility by simply loading the latest drivers found on Creative Labs' Web site.

Many users haven't installed all of Windows 95's audio capabilities. This is easy to check, but you'll probably need your Windows 95 CD. Just use the Add/Remove Programs control panel device, and click on the Windows Setup tab. Then, double-click on the Multimedia components and check all of the components included there. Hit OK, and Windows will load any components you didn't already install. It's important that you load all of the multimedia components into your system for NetMeeting.

One of the more useful components for testing proper playback and recording of audio is the Sound Recorder. You can get to the Sound Recorder by holding down on the Start button, sliding to Programs, then to Accessories, and then to Multimedia. To test your system's audio capabilities, try recording a sound with Sound Recorder and playing it back. It's important to do this before you load NetMeeting because NetMeeting needs a working sound system for proper installation. (See Figure 2-4.) NetMeeting's Audio Tuning Wizard will also help you test and set up your sound system.



Figure 2-4. *Test your audio. By using Sound Recorder, you can record a sound and play it back.*

SAMSUNG EXHIBIT 1017, Page 42

The record button is the one with a red circle on it. The playback button has a single right-facing triangle. If your Sound Recorder doesn't work, you'll need to check a number of things. If your voice sounds great, you can go to the next section. If not, follow these steps to get your audio working:

1. If your Sound Recorder doesn't play back the audio you just recorded, please check whether your microphone is plugged into the correct spot on your SoundCard. (Some systems have a built-in microphone, but I suggest you get a headset for NetMeeting, or at least a decent external microphone.)
2. If your microphone is connected correctly, try recording again with Sound Recorder. Does the green line stay flat, or does it expand and contract with your voice? Figure 2-4 shows what the green line looks like when audio is working properly.
3. If the green line in Sound Recorder expands when you talk into the microphone, make sure your speakers are plugged into the right jack on your sound card. Again, try playing the sound you just recorded. Still no sound? Did you turn on the speakers? If so, go to the next step.
4. Just to make sure that the problem isn't with the recording side of your system, let's try to play back a pre-recorded sound file. There should be a number of WAV files in your C:\WINDOWS\MEDIA\ folder. Use File | Open to open a WAV file and try playing it back. If you don't hear anything, chances are there's something wrong with the playback features of your audio system, so go to Step 5.
5. Open the Multimedia control panel. Make sure there is a device listed under "Preferred device" (see Figure 2-5) and check the "Show volume control on the taskbar" item. Also, adjust the volume to midway (or higher) between Low and High. Try to play a sound again (see Step 4 for directions). Do you hear sound? If yes, great. If no, then you'll need to have a professional check your sound card.

NetMeeting will automatically adjust your audio level, so you don't need to worry about making sure everything is properly adjusted. You just want to make sure your microphone, sound card, and speakers are working okay before you install NetMeeting.

This section is designed to be an overview of the audio setup. Chapter 6, "Working with Audio," covers audio conferencing in greater detail. If you are having problems getting the audio to work, Chapter 15, "Troubleshooting Audio," will be able to assist you.

SAMSUNG EXHIBIT 1017, Page 43

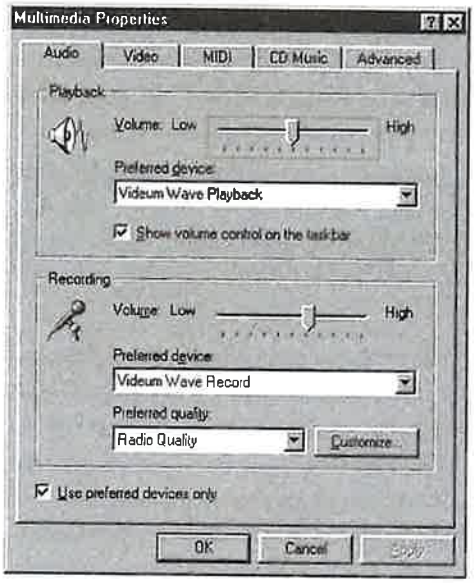


Figure 2-5. *Select your audio device. By using the Multimedia control panel, you can choose the audio device you use to record and play your audio*

If you don't have a video device or camera to set up, you're ready to install NetMeeting and you can go directly to Chapter 3. If you do have a video capture card, or a parallel-port video camera, stick around so we can make sure that it's properly set up.

SETTING UP AND TESTING YOUR VIDEO CAPTURE DEVICE

To use NetMeeting's video capabilities, you'll need a video capture device that's compatible with Video for Windows. If you already have such a device, and you know it works, you can skim this section or skip it altogether. Many video capture devices may not work with NetMeeting. For instance, the Miro DC-10 records in MotionJPEG format only, and NetMeeting can't read compressed video. (At press time, NetMeeting needs standard RGB 16-bit format. Microsoft says additional compatible formats will be added in the future.)

Many people have reported in NetMeeting newsgroups that their video capture devices won't work with NetMeeting. The majority of devices on the market do work with NetMeeting, but there are some that do not. Check with the manufacturer of the device if you have problems. (See Appendix B for places to learn more about NetMeeting.) Most of the problems have been with boards that use overlay technology, which is a digital format that NetMeeting can't

SAMSUNG EXHIBIT 1017, Page 44

understand. Chapter 18 includes a list of the compatible video capture devices tested by Microsoft. If your device isn't on this list, it still may work properly, but you'll need to use a Microsoft utility called VidCap32 to test whether it can record an RGB 16-bit AVI file, which is what NetMeeting requires.

As mentioned earlier, even if your device is compatible, you might need to download the latest drivers and software from the Web site of the company that produced your device. If you are thinking of buying a video capture device, see Chapter 7, which discusses the various devices you can use with NetMeeting.

If you bought a video device, but you have not installed it yet, you'll want to get it running before you install and set up NetMeeting. It's okay to install video devices after setting up NetMeeting, but you'll need to rerun the Setup Wizard.

For now, I'll assume you've bought and properly installed your video capture device. Let's test it to make sure it's working properly before you install NetMeeting. NetMeeting will sense that you have a video capture device and select the appropriate settings.

Using VidCap32 to Record an AVI file

If you don't have VidCap32 yet, get it from http://www.winnov.com/vidcap32.zip and uncompress the file into a blank folder. Then run it. By using VidCap32, you can record an AVI file and test it to make sure your audio and video devices are working properly and that they are compatible with NetMeeting (see Figure 2-6). Select Video from the Capture menu. This will bring up a dialog box that will let you record an AVI file. By using the Capture menu's Video selection, you can record an AVI file. If you see a picture, your video capture device is probably compatible with NetMeeting (see Figure 2-7.) Click on the Video button in the Capture Video Sequence dialog box. This will bring up a dialog box that looks like Figure 2-8. Select your video input. For instance if you have an S-Video camcorder plugged into your video capture card, click the S-Video radio button.

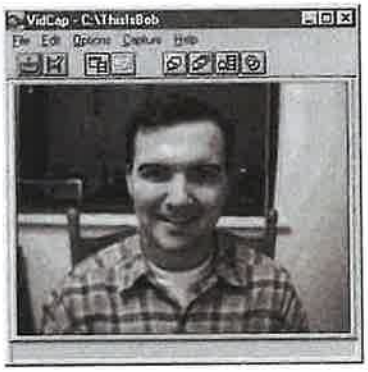


Figure 2-6. *Test video using VidCap32.*

SAMSUNG EXHIBIT 1017, Page 45

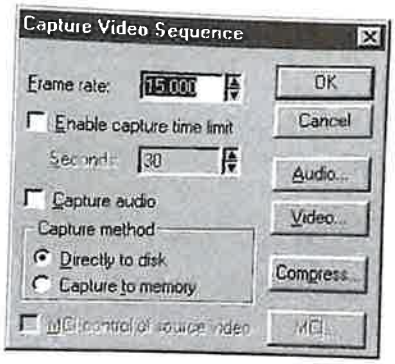


Figure 2-7. *Record a movie using the Capture menu's Video selection.*

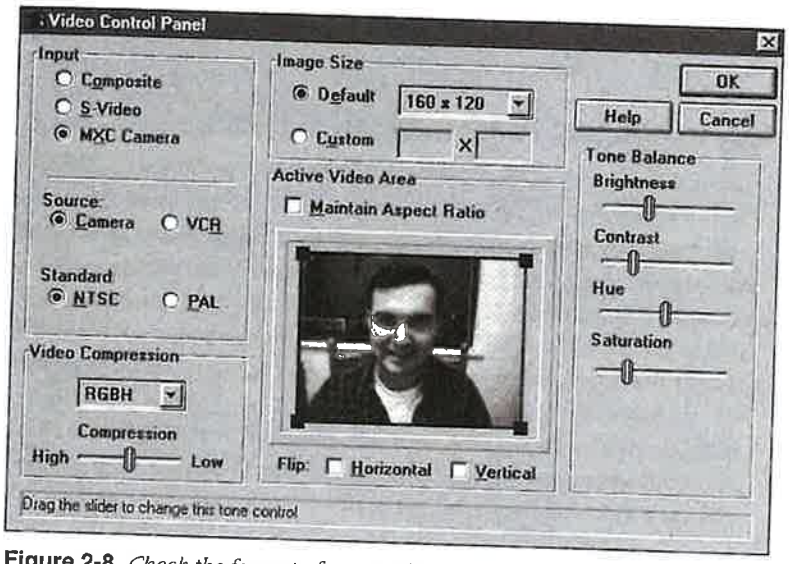


Figure 2-8. *Check the format of your video using the Capture Video Sequence dialog box.*

Under the video compression heading, choose RGB16 (which is also known as RGBH). If, after selecting the correct source for your video device (and your camera or VCR is properly hooked up and turned on), you don't see a moving picture in the middle of the dialog box, then you probably won't be able to use your capture card with NetMeeting.

If you see a good picture in VidCap32, adjust your camera for the best possible picture, click OK in each dialog box, and record an AVI file. Press the Esc key to stop recording.

SAMSUNG EXHIBIT 1017, Page 46

Using Media Player to Play Your AVI file

If you didn't change VidCap's default settings, you'll find that it recorded an AVI file to your hard drive as C:\CAPTURE.AVI. Simply double-click the file to play it. (If you've loaded Internet Explorer 3.0 or newer, your AVI will play back using Active Movie technology. Otherwise, it will play back in Media Player.) If the audio and video are working properly, then you can go on to the next chapter and install NetMeeting.

If either audio or video still isn't working, then you'll need to go through this chapter again, visit our troubleshooting tips in Chapters 15 through 17, or post your troubles on the NetMeeting newsgroups for responses.

Because NetMeeting uses so many different technologies, getting everything set up "just right" can seem pretty daunting. You've learned that if you take your time and go step-by-step, you'll be able to configure your system properly for the best-quality NetMeeting sessions.

FROM HERE...

Setting up NetMeeting wasn't that difficult. Now you're ready to get NetMeeting itself installed and start communicating with your friends and colleagues.

The following chapters are good to visit while you're in the setup mood:

- Chapter 6, "Working with Audio," discusses NetMeeting's audio features in more detail.
- Chapter 7, "Video Conferencing," reviews the video features of NetMeeting, and offers tips on how to extend your video capabilities.
- Chapter 18, "Products That Extend NetMeeting," discusses various products that will enhance your NetMeeting sessions. You might want to review this list now, so you can order products and get them in time for that first big meeting.
- Chapter 19, "Frequently Asked Questions," covers the most popular questions that people ask during their first experiences with NetMeeting.

SAMSUNG EXHIBIT 1017, Page 47

Chapter 3

Installation

In this chapter, you will learn:

- **Where to get NetMeeting**. You can get NetMeeting in several ways; this chapter shows you the most popular places to find it.
- **Preparing for a new version of NetMeeting**. You may have old copies of NetMeeting on your system, which could interfere with a clean installation. This chapter shows you how to prepare your system for the new version.
- **How to set up NetMeeting**. NetMeeting's setup kit is pretty straightforward, but a few "gotchas" make it worth following through NetMeeting's setup process step-by-step.
- **All about NetMeeting's options**. NetMeeting has many options, and you can either enhance or hurt the application's performance with one click of a button. This chapter explains each option and what you may want to change.

Your system is ready and you're itching to start, so it's time to install NetMeeting. This chapter takes you step-by-step through the Install Wizards and shows you NetMeeting's options in detail.

SAMSUNG EXHIBIT 1017, Page 49

There are six steps to installing NetMeeting properly:

1. Check to see whether the latest version of NetMeeting is on your system. Check http://www.microsoft.com/netmeeting for the most recent version available. If you have the same version that is online, there is no need to install the application again and you can skip to Chapter 4.
2. If you need to install a newer version, first back up your system.
3. Download the NetMeeting installation file.
4. Before you install the new version, clean your existing system of all traces of old NetMeeting copies.
5. Run the NetMeeting installation file.
6. Run the NetMeeting application, which presents the NetMeeting Installation Wizard to complete installation.

To check which version is loaded on your system, run NetMeeting, click on Help, and select About from the menu. The About dialog box will tell you what version is installed. If it says version 1.0 or 2.0 beta, you need to upgrade NetMeeting. As of this writing, 2.1 is the newest version, but a newer version might be available when you read this book.

NOTE

It's always important to use the latest version of NetMeeting so that you will be compatible with other users. Microsoft often fixes problems and adds new features, so there's always good reason to install the latest version.

DOWNLOADING NETMEETING

You can download NetMeeting from various places or simply install it from the included CD-ROM. NetMeeting also comes with Internet Explorer 4.0, so if you buy or subscribe to computer magazines, you might find it on an accompanying CD. To insure that you have the latest version of NetMeeting, download it from Microsoft's NetMeeting home page.

SAMSUNG EXHIBIT 1017, Page 50

WEB ALERT

You can get NetMeeting from two places on Microsoft's Web site: the NetMeeting home page, http://www.microsoft.com/netmeeting/, and as part of Internet Explorer, which you can find at http://www.microsoft.com/ie/. Internet Explorer takes longer to download than NetMeeting, so if you only need the latest version of NetMeeting, get it from the NetMeeting home page. NetMeeting is also available in several different languages, including Chinese, Czech, Danish, Dutch, English, Finnish, French, German, Greek, Italian, Japanese, Korean, Norwegian, Polish, Portuguese, Spanish, and Swedish.

NetMeeting is a Microsoft product, but that doesn't mean you must use it with Internet Explorer instead of Netscape Navigator. NetMeeting is an application that can run separately from the browser (in fact, it will run even if you don't have a browser on your system). However, you can access some ILS (Internet Locator Server) directory pages using a Web browser. ILS directories are servers that keep track of people running NetMeeting so that they can easily call each other, sort of like a big phone book.

PREPARING FOR INSTALLATION

Microsoft's Web site recommends simply installing new versions of NetMeeting over old versions. I don't recommend this because it can cause problems, especially if a beta version is already installed. Instead, you should first uninstall any old versions and delete the NetMeeting folder.

NOTE

If you're using Windows NT, it's highly recommended that you load Service Pack 3 or newer before installing NetMeeting, especially if you plan to use NetMeeting's application sharing feature.

SAMSUNG EXHIBIT 1017, Page 51

Removing Old Copies of NetMeeting

To uninstall NetMeeting, choose Start, Settings, Control Panel, and open the Add/Remove Programs tool. Select the latest NetMeeting listed and click Add/Remove. Because the uninstall program may leave several files (including a few invisible files) in the NetMeeting folder, delete the NetMeeting folder after uninstalling. Restart your machine after uninstalling the older version and before installing the new version.

If you're going to update the drivers for your sound card or your video capture device, you must uninstall and delete NetMeeting again after each upgrade. Therefore, it's best to update your sound card and video capture devices before you install NetMeeting. Also, follow the procedures in Chapter 2, "Preparing Your System," to get your machine ready for NetMeeting.

INSTALLING NETMEETING

You should now have a clean system with a temporary folder containing the downloaded NetMeeting install file. When you double-click the downloaded file, it automatically decompresses and installs NetMeeting. The name of the downloaded file depends on whether you chose the NT or Win95 version, and also which language version you downloaded. If you installed the full version of Internet Explorer 4, then NetMeeting is already installed and this step can be skipped.

The install application asks you to create a new NetMeeting folder. Resist the urge to put it somewhere other than the default directory (C:\PROGRAM FILES\NETMEETING for Windows 95 or C:\PROGRAM FILES\NETMEETINGNT for Windows NT); otherwise, NetMeeting's application sharing doesn't seem to work properly.

NetMeeting tells you when the installation has been successfully completed. If NetMeeting doesn't install properly, you might have a corrupted download file, a temp folder that's full of corrupted install files, or something wrong with your system (for instance, not enough available disk space on your hard drive). To fix these problems, download NetMeeting again, empty out your C:\WINDOWS\TEMP folder, and run ScanDisk utilities. To free up more disk space, move some less important files to a different drive, or delete them altogether, and restart your system before trying to install again.

> **NOTE**
>
> If your operating system is loaded on a drive other then C (for instance, D), NetMeeting will automatically suggest the correct path on your boot drive. Accept NetMeeting's suggestion by clicking OK.

SAMSUNG EXHIBIT 1017, Page 52

With Windows 95, you won't need to reboot after installation, although I suggest that you restart anyway to confirm that everything went well. (The Windows NT version forces you to reboot.) To check the installation after restarting your computer, choose Start, Programs, and NetMeeting. If it was successful, you'll have some more setup options to contend with.

SETTING UP NETMEETING

When you run NetMeeting for the first time, you'll be faced with the NetMeeting Installation Wizard, which walks you through a series of screens that ask you information needed to properly configure NetMeeting. The following sections of this chapter will take you screen by screen, explaining exactly what the information is needed for.

Many first-time users breeze through these steps without considering the consequences. If you improperly fill in some information, NetMeeting might not work correctly, and in the worst case, you might not be able to use it at all.

You must complete the entire setup process before NetMeeting will run, so if you hit Cancel at any time, you'll be forced to restart the Installation Wizard from the beginning the next time you run NetMeeting.

NetMeeting is one of the few applications that forces you to go through such an extensive setup process before you can run it. This is because NetMeeting is a different kind of application than, say, Microsoft Word. It needs information about you and your equipment to work properly. For instance, it needs your name, location, and email address to identify you uniquely on the Internet so that people can call you or send you email.

Starting NetMeeting's Installation Wizard

The first time you run NetMeeting, you should see a screen like the one shown in Figure 3-1. This is the first of about half a dozen dialog boxes you'll have to wade through to complete the installation. You can't run NetMeeting without completing this series of the Installation Wizard, so go ahead and click Next.

> **NOTE**
>
> If you realize that you made a mistake after you click Next, you can click Back at any time to return to previous dialog boxes and make corrections. Although these settings can be customized inside NetMeeting, it's much better to configure them correctly at the start rather than spend time finding and fixing things later on.

SAMSUNG EXHIBIT 1017, Page 53

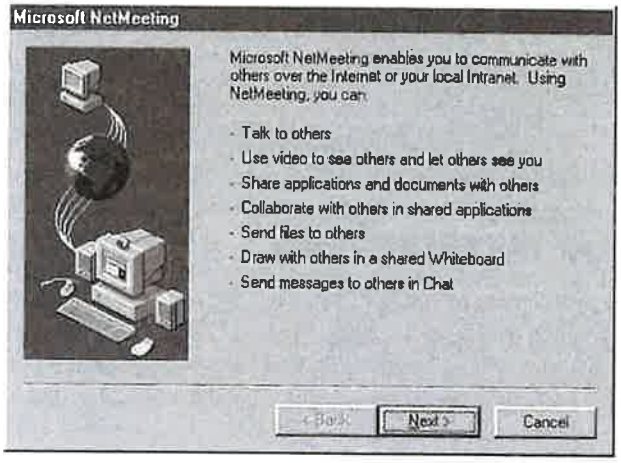


Figure 3-1. *The Installation Wizard helps you configure NetMeeting. Just click Next after you finish setting options to move to the next dialog box.*

Logging on to a Directory Server

The second screen in the NetMeeting setup dialog is the Directory Server dialog box (see Figure 3-2). The easiest way to make and receive calls is to utilize an ILS server. An ILS server, as mentioned, is like a big phone book. I will go into more detail about the ILS server in Chapters 4 and 13. Microsoft lets you choose between its servers and a few others. If you want other people on the Internet to call you, you should be listed on an ILS. There are several different servers to choose from, but I recommend that beginners choose one of Microsoft's servers, because they are the most popular. After you have run NetMeeting for a while you can easily change the server you are registered with. One reason not to use a Microsoft server is because your friends might be listed on a different server, and you may prefer to use that one. Another good reason not to use the Microsoft servers is that they are usually very busy. It can take a considerable amount of time to load the long list of names when there are several hundred people using the same directory server.

NOTE

If you don't want to get calls from people you don't know or you aren't using the Internet to connect NetMeeting, don't list yourself on an ILS server. You'll find this option on the Calling tab in the Options dialog. This is discussed in more detail in Chapter 4.

SAMSUNG EXHIBIT 1017, Page 54

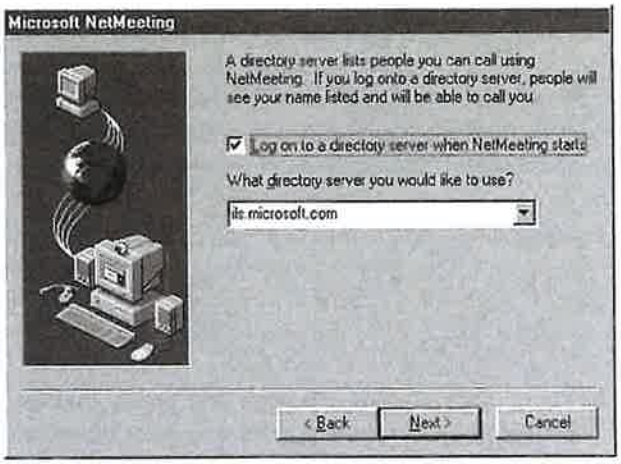


Figure 3-2. *Select which directory server you want to be listed in.*

If you're using NetMeeting solely to connect directly with your coworkers on an internal LAN, there's no need to utilize an ILS server, because all the Microsoft ILS servers (in fact, all public ILS servers) can only be accessed via the Internet. Even Microsoft's employees can't use the Microsoft ILS servers because the servers are outside Microsoft's corporate firewall. If you're inside a corporate firewall, ask your network administrator about your NetMeeting options. (Your administrator can refer to Chapter 11, " Configuring Corporate Firewalls," to find out how to use NetMeeting with a firewall.) Your intranet may also be configured with its own ILS server. Chapter 13 discusses the details of setting up your own ILS server.

After you've completed the Directory Service dialog box, click Next to fill in your user information.

Entering Information About Yourself

You'll need to fill in information about yourself so that other NetMeeting users can find you. Even if you don't want people to find you, you must at least fill in your name and email address (see Figure 3-3).



Figure 3-3. *Fill in your personal information so your friends can find you.*

SAMSUNG EXHIBIT 1017, Page 55

Now you're faced with a dilemma: do you enter your real name and email address, which is put on a server for all to see, or do you enter a false name and email address? You might be tempted to supply false information, which lets you remain anonymous online. Since NetMeeting lets you hide your name, and because people need your email address to call you (and send you notes), it's best to fill in your real information.

Also, the SpeedDial feature of NetMeeting relies on the email address you enter, so if you choose a false email address, make sure that you don't change it; otherwise, your old friends won't be able to call you. (When you add a new person to your SpeedDial list, it stores the email address posted on the ILS server.)

For most users, honesty is the best policy. If you don't want your name listed, you can later tell NetMeeting to keep your listing "hidden," sort of like having an unlisted phone number. Why would you choose to hide your listing? One reason is that you may get harassing phone calls if you have a female-sounding name. I recommend that you always use a male-sounding name if you list in a public directory, unless you want to get called by a bunch of guys with, shall we say, less than honorable intentions. (One Microsoft NetMeeting tester reported that when he tested NetMeeting's "answering" capability by listing female names in a public directory, he'd get dozens of calls within a matter of minutes.) So, if you always use your real email address, your friends will be able to call you, and other people will still be able to send you messages, even if you decide not to have your name listed in the ILS server. It's your call. You can use any alias you want for your name but use your real email address.

There's another reason to type in a name other than your real name. Some people like to place themselves higher on the directory service so they will be found by more people and get more calls. If you'd like to "move higher" on the directory service, you can put an A (or several) before your name. An even better way to get higher on the list is to put a character such as an apostrophe (') or a minus sign (–) in front of your name.

Categorizing Your User Type

Version 2 of NetMeeting has a feature that lets you "hide" (or filter) potentially offensive listings and people. This is great, because, as with some chat rooms on the Internet, users may register themselves on the ILS in order to meet others, and earlier versions of NetMeeting didn't have any facilities to hide people who fit into—shall I say—the "adult" category. NetMeeting 2 addresses this problem with a feature that tells everyone what kind of user you are and lets them choose not to see you (see Figure 3-4).

SAMSUNG EXHIBIT 1017, Page 56

There are three user categories:

- *Personal use* means that you want to talk with other NetMeeting users who perhaps are your family or friends, but you don't want to see potentially offensive terms or be exposed to people talking about sexual or offensive topics.
- *Business use* means that you want to see only other business people.
- *Adults-only use* means that you don't mind seeing other listings that contain possibly offensive content and sexual terms. If you choose the Adults-only category, you'll be able to see all viewers, including business and personal users. Business and personal users won't be able to see you, however.

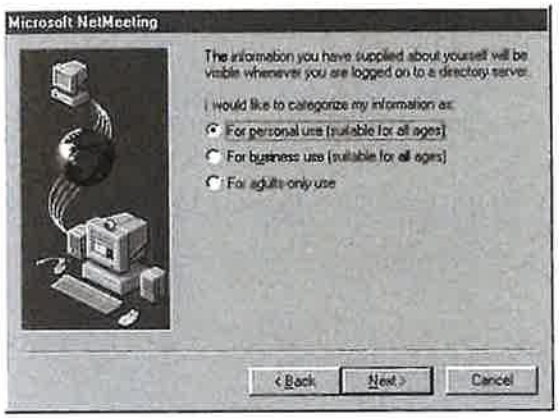


Figure 3.4. *By putting yourself into a category, you'll see fewer "offensive" listings.*

Keep in mind that you can change your views at any time, so you can see people who list themselves in another category quite easily later. For now, just pick the one that's closest to the category you'll use most often.

NOTE

NetMeeting doesn't ensure that you won't see offensive material (or talk with offensive people, for that matter). It just gives you a way to hide much of it. Parents should never let their children use NetMeeting unsupervised. If you do, tell them not to talk with "strangers." Let them talk only with their friends, who you approve.

SAMSUNG EXHIBIT 1017, Page 57

When you're done with the User Category dialog, click Next to set your connection speed.

Choosing Your Connection Speed

Choose a setting that matches or is lower than your connection speed. This is pretty straightforward if you use NetMeeting on a dial-up connection—just enter your modem speed, as shown in Figure 3-5. However, if you're connected to a LAN, it can be a little more tricky.

Figuring out the connection speed on a LAN is sometimes complicated. For example, my company has a 100 Mbps (megabits per second) network but is connected to the outside world via an ISDN line that everyone shares. When placing calls outside of our LAN, we found that NetMeeting's audio would perform better when we used the 28.8 setting rather than the ISDN or LAN settings. If the connection is between two people on the LAN, however, choosing the LAN setting provides the best sound quality for NetMeeting.

NetMeeting uses these settings to pick the best method of audio compression. You're really telling NetMeeting the maximum amount of bandwidth you have available. Sometimes I get better audio quality at home if I tell NetMeeting that I have a 14.4 modem, even though I really have a 33.6. That's because NetMeeting picks a more efficient audio codec (more about this in Chapter 6).

ISDN speeds are usually 64 Kbps (kilobits per second) or even 128 Kbps if you have a dual-channel setup. LAN speeds are usually 10 Mbps or 100 Mbps. If you have one of the new cable modems, you need to check its upload speed. (Upload speeds are usually dramatically slower than the download speeds.) If the upload speed is 56 Kbps or faster, select ISDN. If your upload speed is 28.8 or 33.6, you'll need to select 28.8.

Click Next to continue to the dialog that sets the volume levels for your speakers and microphone.

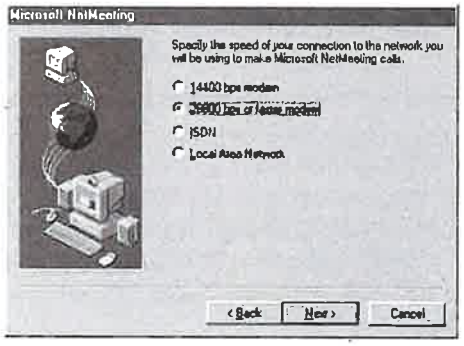


Figure 3-5. *If you enter your modem or network speed, NetMeeting can use the most efficient compression technology.*

SAMSUNG EXHIBIT 1017, Page 58

NOTE

Buying a 56 Kbps modem won't improve NetMeeting's performance. NetMeeting requires two-way bandwidth; however, the 56 Kbps modems give you only faster download speeds (and even then, only with ISPs that have special equipment designed to support these types of modems).

Adjusting Your Speaker Volume

The Audio Tuning Wizard tests the speakers and microphone connected to your computer. The first dialog that you will see, shown in Figure 3-6, allows you to set the volume of your speakers. When you press the Test button, a series of tones will be played continuously until you press either Next or Stop. While the tones are being played, adjust the volume slider to a comfortable level. The volume will increase as you move the slider to the left. When you are satisfied with the output level, press the Next button.

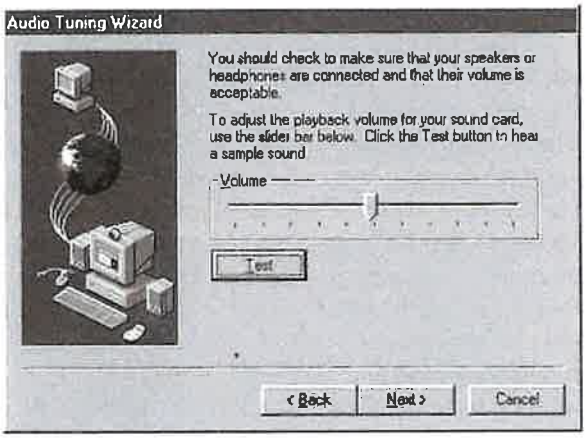


Figure 3-6. *Setting the speaker volume in the Audio Tuning Wizard.*

Recording and Testing Audio

The dialog box that you should see now looks like a straightforward way to test your microphone level (see Figure 3-7). That's because it does a couple of things in one step. It checks to see whether it's getting any sound from your microphone, and then uses your voice to set the microphone automatically. Don't make the mistake of clicking Next without doing what it asks. You will see visual feedback on the meter, colored in yellow, green, and red, as you speak into the microphone.

SAMSUNG EXHIBIT 1017, Page 59

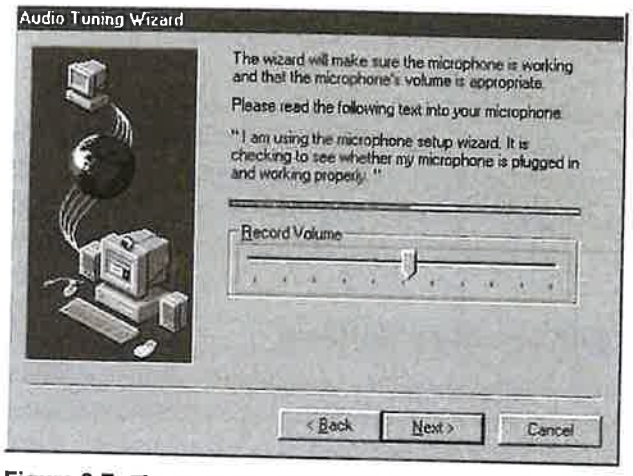


Figure 3-7. *The Audio Tuning Wizard uses your voice to properly set your microphone's level.*

If you've followed all the proper steps to get your system ready in Chapter 2, "Preparing Your System," you can probably breeze through this dialog box. But even if you have set up your system properly, this dialog box has a couple of "gotchas."

First, with some sound cards, NetMeeting might accidentally switch your audio selection from microphone to "line in" or some other input. You can use the Volume Control program to make sure that the correct audio input is selected before you click the Start Recording button in NetMeeting's Audio Tuning Wizard.

There are several ways to run the Volume Control program, but the best way is to add it to your system tray. To do this, first open your Multimedia control panel. On the Audio tab, check the box that says "Show volume control on the taskbar" and then double-click the little speaker icon that's next to the clock on your system tray. The Volume Control program also lets you change the volume of your speakers and the recording level of the microphone.

You can skip this recommendation and try recording your voice in the Audio Tuning Wizard because NetMeeting will tell you if something's wrong. It will give you an error indicating that it couldn't pick up anything from your microphone. You can always click Back in the wizard, so you can set up your audio at any time. You can also skip recording audio by pressing Ctrl + Tab.

When recording your audio information, it's very important that you speak as if you were talking with a friend on the telephone. Don't speak louder than normal. Also, don't take the recording test lightly—you must talk the entire time or your microphone may not get set up correctly.

SAMSUNG EXHIBIT 1017, Page 60

TIP

It doesn't matter what you say into the microphone, as long as you keep talking. NetMeeting gives you a little script to read, so you won't be at loss for words. You might as well use it.

If you successfully complete this audio test, when you click Next, you should see a dialog box that says "You have tuned your settings" (see Figure 3-8). If it says something else (see Figure 3-9), you'll need to refer to Chapter 15, "Troubleshooting Audio," and figure out why your audio device isn't working properly.

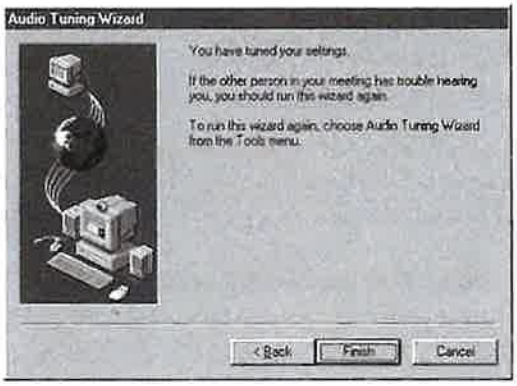


Figure 3-8. *You'll see this dialog box if your audio system is working properly.*

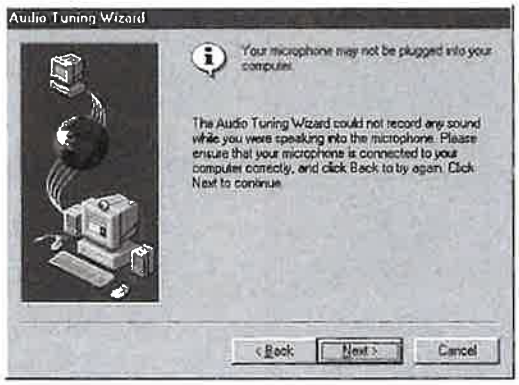


Figure 3-9. *You'll see this dialog box if your audio system is not working properly.*

SAMSUNG EXHIBIT 1017, Page 61

The "You have tuned your settings" message confuses many people who have a full-duplex sound card because NetMeeting sets every sound card to half-duplex. Don't fret. You can turn on full-duplex capability later, when you're running the NetMeeting application.

Guess what? You've completed the setup process if you see the message "You have tuned your settings" and a Finish button appears. Click Finish and NetMeeting will start. You can now choose to connect with someone and talk with them, or read the next section and follow step-by-step through all the NetMeeting options. I recommend that you go through the options before you make the first call, just so you know how to change something or—at the very least—turn on your full-duplex capability.

CHANGING SETTINGS AFTER NETMEETING IS INSTALLED

To change almost any option in NetMeeting, choose Options from the Tools menu. This will bring up a tabbed dialog box. The next several pages go through all the options, from General to Protocols, and tell you the effect each selection has on NetMeeting.

General Options

The General page in the Options dialog box lets you set such things as whether NetMeeting will automatically answer your calls and where you want NetMeeting to save files that were transferred to you. The following sections discuss the General Options and what they'll do to your system (see Figure 3-10).

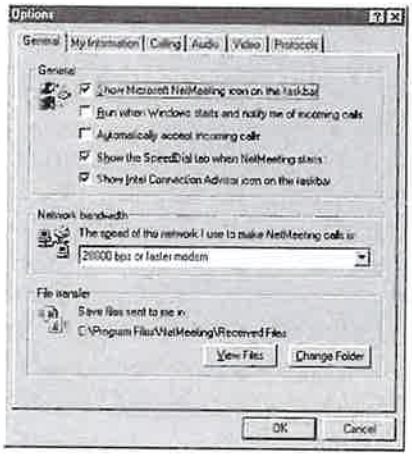


Figure 3-10. *These are the General Options, which you access by selecting Options from the Tools menu.*

SAMSUNG EXHIBIT 1017, Page 62

Show Microsoft NetMeeting Icon on the Taskbar

This option does just what it says—it shows the NetMeeting icon on the taskbar. This is very handy because you can then right-click the icon to open or close NetMeeting. You can also quickly see whether it's running.

Run When Windows Starts and Notify Me of Incoming Calls

If you select this option, you can run NetMeeting in an "answering" mode without the user interface cluttering up your screen.

Automatically Accept Incoming Calls

This option also does pretty much what it says. When any NetMeeting call comes in, it can either be answered automatically or a dialog box will ask you if you want to accept the call. If you want your colleagues to be able to check into your desk at any time and look around, select this option. If you don't select it, you'll have to click Answer whenever someone calls.

If you're going to enable this option, make sure you pay attention to who calls into your desk. A Microsoft product manager told me that he left his desktop computer in "auto answer" mode and didn't notice that his employees were listening to his phone calls. For that reason, I recommend that most people do not select this option.

Show the SpeedDial Tab When NetMeeting Starts

This option, too, does what it advertises. You might deselect this option when you don't want to use NetMeeting's SpeedDial feature and if you want less clutter in your taskbar.

Show Intel Connection Advisor Icon on the Taskbar

If you're using a slow machine, such as a 486, you may want to deselect this option. The Intel Connection Advisor (ICA) doesn't really do anything except report on the quality of your connection. You can turn it off without losing any functionality.

The Network Bandwidth Option Group

The option in this group lets you set the speed of the network you use to make NetMeeting calls. This was set during the installation routine, but make sure that it's still correct. NetMeeting uses this setting to pick the audio compression technology, and manage the audio/video bandwidth usage. If you're uncertain about your bandwidth or have a device that's not listed (such as a radio modem), always use a connection speed that's slower than your device. So, if you have a wireless modem that gives you 19.2 Kbps, select 14400 bps or Faster Modem.

The File Transfer Option Group

This group of options lets you set the default location for files that people send you. I always like to see the files on my desktop so that I can easily throw them in the

SAMSUNG EXHIBIT 1017, Page 63

Recycle Bin or test them for viruses. If you want files saved to your desktop, you'll need to click Change Folder and then select Windows and Desktop. This selection should then read Save Files Sent to Me In C:\WINDOWS\DESKTOP\.

My Information Options

Use the My Information page to change the information listed about you in the NetMeeting directories. It's required that you put something in the First Name, Last Name, and E-mail Address text boxes (see Figure 3-11). You also must pick an information category.

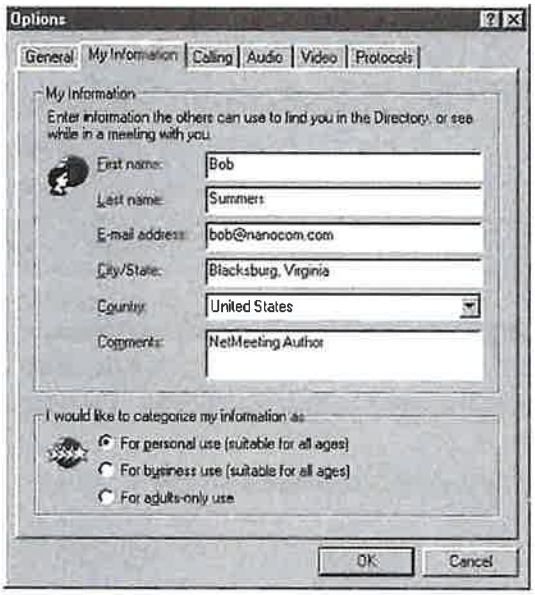


Figure 3-11. *Enter your identifying information here so other people will be able to find you in the server listings.*

> **NOTE**
>
> If you've included material in your information listing that could be considered offensive, choose "For adults-only use." Otherwise, you might receive some nasty phone calls from people who don't appreciate seeing your listing in a non-adult-rated area.

SAMSUNG EXHIBIT 1017, Page 64

Calling Options

If you no longer want to be listed in a NetMeeting directory, the Calling page of the Options dialog is the one to use (see Figure 3-12).

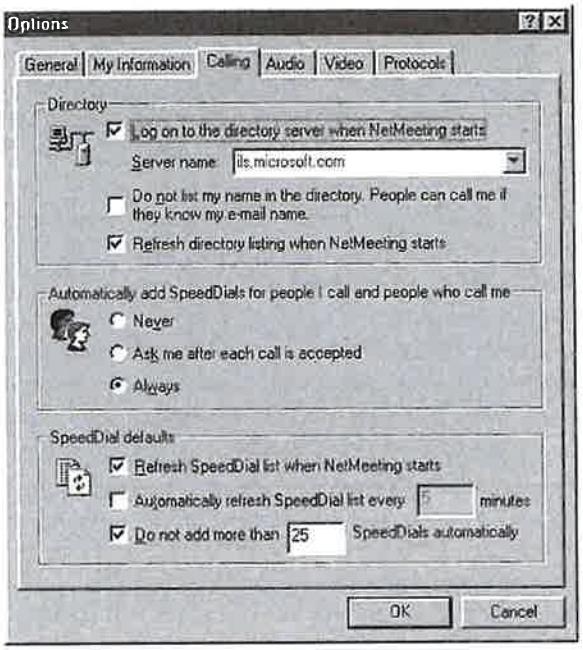


Figure 3-12. *This is where you can change the server you're registered with and set up the SpeedDial list properties.*

If you deselect the "Log on to the directory server when NetMeeting starts" check box, you won't be listed on any ILS server and no one will be able to call you by using a SpeedDial shortcut. (SpeedDial shortcuts are discussed in more detail in Chapter 4.) A better way to remain "unlisted" is to leave this check box selected and select the "Do not list my name in the directory" check box. This is analogous to having an unlisted phone number. This way, your friends can continue to call you if they have your email address.

NetMeeting can create SpeedDials automatically when you call someone or when someone calls you. The "Automatically add SpeedDials for people I call and people who call me" option has three settings to select from: Never, "Ask me after each call is accepted," or Always. The default setting is Always, but, after using NetMeeting for a long period of time, you may find that the automatic SpeedDial option can clutter your SpeedDial list, especially if you work

SAMSUNG EXHIBIT 1017, Page 65

in a call center or get a high volume of calls. Such users should select the Never setting, or "Ask me after each call is accepted", which is my preference. That way when you call someone, NetMeeting will ask you if you'd like to create a SpeedDial for that person.

SpeedDial shortcuts are very useful because NetMeeting automatically checks whether those people you have SpeedDial shortcuts for are actually online and ready to accept a NetMeeting call. You'll need to set a "refresh rate" for the SpeedDial list, however, because NetMeeting can only check whether other people are online during a refresh of the SpeedDial list. You can always refresh the list manually, so don't set this option to a setting too low, because it uses processor power and bandwidth, both of which might interrupt a NetMeeting call for a few seconds. If you want to refresh your Speed Dial list manually to conserve bandwidth, you should deselect the "Refresh SpeedDial list when NetMeeting starts" check box.

Some people might find that their SpeedDial list gets unwieldy after it grows past a certain number of entries. I don't like to see more than about 25 entries, so if you're like me, just leave it on the default setting.

> **NOTE**
>
> SpeedDials work only if you never change the ILS server that you list with. If you change ILS servers, your friends or colleagues will have to delete you from their SpeedDial list so your new address can be added.

Audio Options

The most sought-after option on the Audio page is "Enable full duplex audio so I can speak while receiving audio" (see Figure 3-13). If your sound card supports full-duplex, this option lets you check the box; otherwise, it's grayed out. Full-duplex is discussed in greater detail in Chapter 6.

Use the Audio page to turn on NetMeeting's full-duplex option so that you can talk at the same time your partner is talking to you.The "Enable auto-gain control" option (grayed out in the illustration) works only with certain sound cards, such as the Sound Blaster AWE64, which let Windows automatically adjust the level of your microphone. If you can select this setting, you should test whether it improves your audio or makes it worse. In my tests with the AWE64, this option seemed to give a more consistent audio level—thus, better audio quality—especially if I moved closer to my microphone, which, on other sound cards, would have distorted my voice noticeably in NetMeeting. The auto-gain control works best in a quiet environment. If you have a lot of background noise, turn this option off.

SAMSUNG EXHIBIT 1017, Page 66

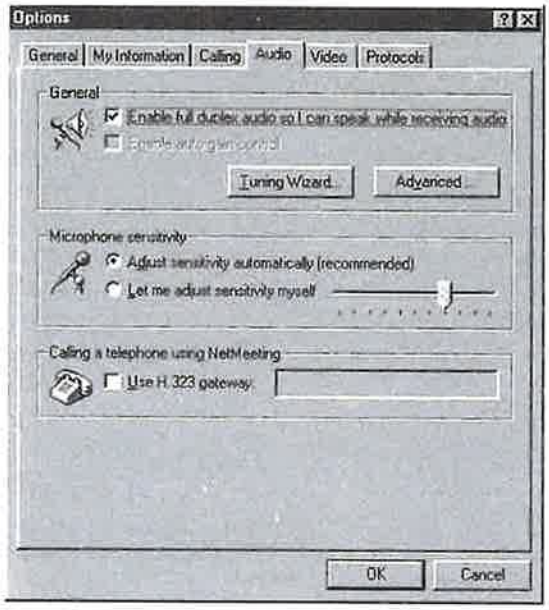


Figure 3-13. *Use the Audio page to turn on NetMeeting's full-duplex option so that you can talk at the same time your partner is talking to you.*

The Tuning Wizard button brings you back to the Audio Tuning Wizard. The Advanced button in the General Option group lets you manually select the compression techology (called *codecs*). See Chapter 6, "Working with Audio," for a more thorough discussion of audio features and why you would want to manually adjust the codecs.

There's a selection in the Audio Tuning Wizard that lets you manually adjust your microphone sensitivity, although it's not recommended that you do so unless the wizard isn't setting your audio properly.

A third setting on the Audio page is "Calling a telephone using NetMeeting". You should keep this setting deselected and blank, unless you have a gateway that you want to communicate with to allow NetMeeting to call a real telephone. This feature is really cool. One of Microsoft's product managers set up a gateway so that his friends and coworkers could call his phone from anywhere in the world, and they'd have to pay only for their Internet connection. Chapters 6 and 12 cover this feature in more detail.

Video Options

The Video page of the Options dialog lets you set up your video camera and your video receiving options (see Figure 3-14). If you don't have a video capture device, the source button will be grayed out, and several other options may be grayed out too.

SAMSUNG EXHIBIT 1017, Page 67

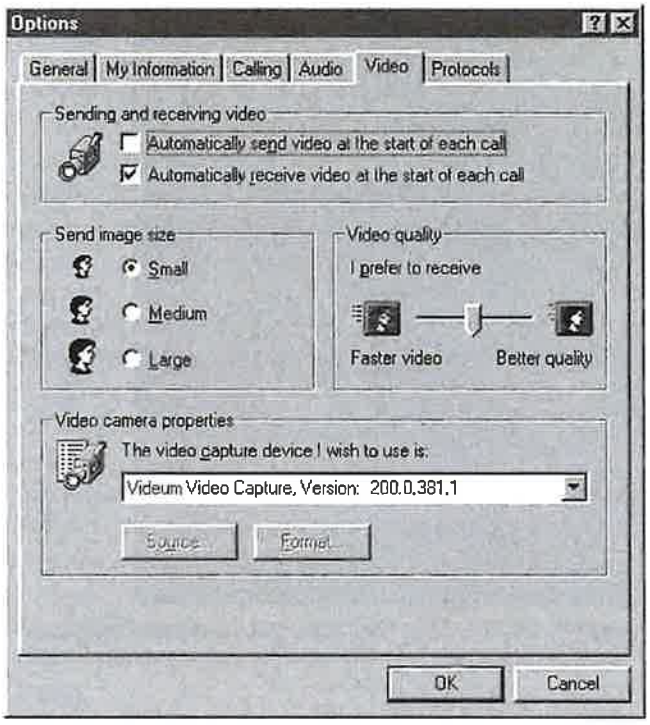


Figure 3-14. *The Video page lets you set video size, quality, speed, and several other settings.*

If you don't want to worry about settings when you start a NetMeeting call, you should select the "Automatically send" and "Automatically receive" video check boxes. However, video takes a lot of bandwidth and it sometimes interferes with audio quality. It might be better—especially on Internet calls—to first make audio contact with someone and then choose the best video settings.

You can switch between several image sizes in the "Send image size" option group. The best option to use for the Internet (low-bandwidth situations) is the Small video size. If you have a typical LAN-based system, Medium will work fine. If you have 200-MHz MMX machines with a high-speed LAN, try the Large video size. (You can use the Large video size on slower machines and networks, but you probably won't get very satisfactory results.)

The "Video quality" section does exactly what it says. If you move the slider to the right, you'll get a much sharper image from your friend's video source (it doesn't make you appear sharper to your friend, it only affects received video). If you move the slider to the left, you'll see a blurrier image but more frames per second (better performance). Video quality is discussed in greater detail in Chapter 7.

SAMSUNG EXHIBIT 1017, Page 68

Protocols Options

The last page, Protocols, as shown in Figure 3-15, will not require any modification by most users. Version 2.1 of NetMeeting has two available protocols: Network (TCP/IP) and Null Modem. The default selection is Network (TCP/IP). With this option enabled, NetMeeting will communicate over any connection that supports the TCP/IP protocol. This includes, but is not limited to, modem, ISDN, or LAN connections to the Internet as well as any intranet that supports this protocol. It is important to note that the Novell protocols (IPX/SPX) are not supported in version 2.1 but were in earlier versions. A null modem connection will allow you to connect two machines via a serial cable and null modem adapter. Again, most users should not make any modifications to the Protocol options.

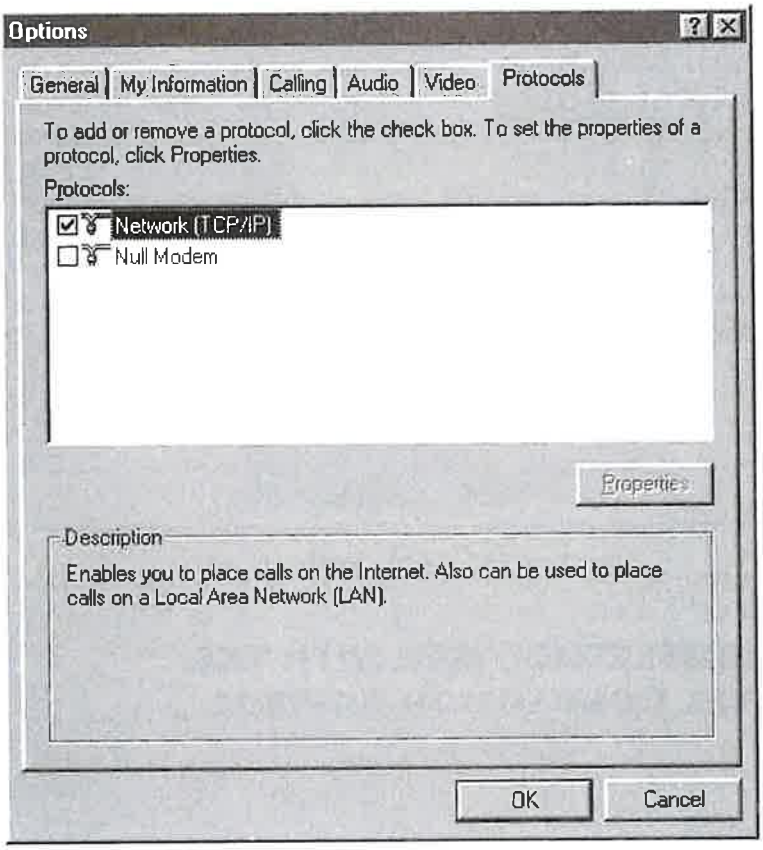


Figure 3-15. *You'll need to change NetMeeting's protocols if you want to use anything other than the default TCP/IP network (Internet) settings. Otherwise don't change these settings.*

SAMSUNG EXHIBIT 1017, Page 69

CUSTOMIZING NETMEETING SOUNDS

Many people who work in a busy office change their phone ringer to a different, distinctive sound. This is very easy to do in NetMeeting. NetMeeting includes two default sounds: one that rings when a person requests to join a conference (or tries to call you), and one that indicates when a person is leaving or entering into a conversation with you.

To change these sounds, just open the Sound tool in the Control Panel, click the NetMeeting event for which you want to change the sound, and then click Browse and find the new WAV file that you'd like to use. Figure 3-16 shows what the Control Panel looks like and what events are listed for NetMeeting 2.

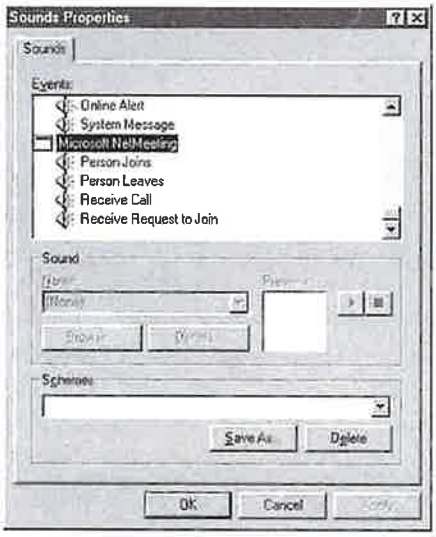


Figure 3-16. *The Sounds Properties dialog allows you to set the sounds played during NetMeeting events.*

TROUBLESHOOTING WITH THE INTEL CONNECTION ADVISOR

When you're using NetMeeting over the Internet, you'll sometimes find that there's a problem getting enough bandwidth for high-quality conferencing. That's when you should turn to the Intel Connection Advisor (see Figure 3-17). The Intel Connection Advisor (ICA) monitors several things: the available bandwidth, the amount of audio delay, how much processor power is being used, and how many audio packets are being lost. The ICA runs automatically with NetMeeting, although you can disable it.

SAMSUNG EXHIBIT 1017, Page 70

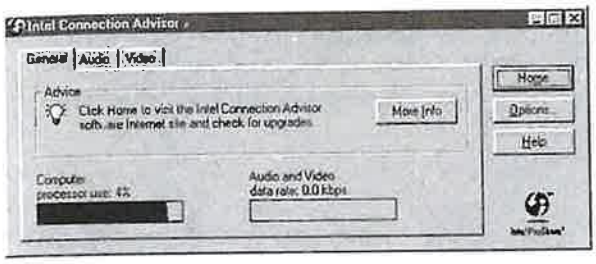


Figure 3-17. *The Intel Connection Advisor, which ships with NetMeeting, tracks how well your system communicates with other systems.*

You can find the ICA in the system tray, which is the space in the taskbar where utility icons are kept. Look for the clock on the taskbar and you'll find the NetMeeting and ICA icons. Double-click the round blue and white icon to open the ICA. You can also right-click it to open it up or look at its properties.

The ICA is useful to diagnose problems. For example, you may have occasional problems with NetMeeting's audio and, by looking at the ICA, you might find out that you need more bandwidth. Often, you can fix the problem simply by hanging up and calling the other party again.

The ICA will sometimes tell you how to fix the problem. For example, if it isn't getting a good audio signal from the microphone, it will tell you to readjust the microphone or move closer to it.

Some people don't find the ICA that useful, so they've choosen to keep it from loading. To do that, you can right-click it, choose Properties, and stop it from appearing in the system tray.

FROM HERE...

Now you have NetMeeting set up properly. That wasn't too bad, was it? You also learned a bit about how you can change settings in NetMeeting. As you experiment with NetMeeting, refer back to this chapter when you want to change the program's options.

Now that NetMeeting is set up and ready to use, check out these chapters:

- Chapter 4, "Making Your First Call," discusses how to connect with other people and how to keep track of your NetMeeting partners. It also covers how to use NetMeeting with the various network and modem hookups available.
- Chapter 6, "Working with Audio," discusses NetMeeting's audio features in more depth.

SAMSUNG EXHIBIT 1017, Page 71

- Chapter 11, "Configuring Corporate Firewalls," helps you and your network administrator get NetMeeting working properly on your corporate intranet. It also shows how to set up NetMeeting to get around firewalls.

SAMSUNG EXHIBIT 1017, Page 72

Chapter 4

Making Your First Call

In this chapter, you will learn:

- **Connection methods**. You can use NetMeeting over the Internet or a corporate LAN, depending on your needs.
- **Making a connection**. The first step in a NetMeeting session is to establish communication between you and a remote party.
- **Session management**. During a call, there are many options at your disposal for managing the session.
- **Methods for establishing connections**. After you have used NetMeeting for a while, you'll look for easier ways of connecting. This chapter outlines a couple of methods.

So far, this book has discussed some of the basics of NetMeeting and shown you how to install NetMeeeting and set it up. Now you're ready to make that first connection. For many of you, this will be the first time you've used your computer for live interactive communication. Some of you may have had experience with this in a chat room on a commercial online service (such as CompuServe or America Online) or in Internet Relay Chat (IRC). Live text communication was

SAMSUNG EXHIBIT 1017, Page 73

the first mechanism for people in different parts of the world to meet via their computers. Over the last couple of years, other methods, including voice and video communication, have been developed.

Using NetMeeting to connect with someone can be one of the most rewarding experiences you'll have with your PC. Unfortunately, one of the most difficult parts of connecting with another person is finding that person. Don't worry—this chapter takes all the difficulty out of establishing a NetMeeting session; it discusses all aspects of call management, from setup to hang up. If you've used NetMeeting before, you may want to skip this chapter.

USING NETMEETING WITH THE INTERNET OR A CORPORATE LAN

If this is your first time going live, you're in for a real treat because your mind will be opened to a whole new area of communication. You'll look at your computer in a completely different light. Who knows—you may begin to realize that, in the not-too-distant future, all communication will be conducted through your PC. This technology lets you communicate in many ways, some of which you've never experienced, although we're not quite to *The Jetsons* stage yet.

First, you need to determine how you'll use NetMeeting to connect—over the Internet or a corporate LAN. These two methods are very similar, but the scope of who you can reach is very different. Connecting via the Internet or a LAN involves using network addressing to manage a session (See Chapter 1, "An Overview," for more information on network addressing).

Of course, each method has advantages and disadvantages, and you'll learn about them, too.

Making a Connection through the Internet

Using the Internet with NetMeeting can be very powerful. Communicating with thousands of other people anywhere on the planet is only part of the incredible capabilities at your fingertips. As pointed out in Chapter 1, the Internet is a giant network of computers from around the world that communicate with the same protocols. Until now, most people used the Internet to browse Web pages and send and receive electronic mail. These are great applications of a global network, but there's a better one: NetMeeting. On the Internet and on a LAN, you can have one-on-one sessions and multipoint sessions with NetMeeting.

To use NetMeeting over the Internet, the person you want to contact must have NetMeeting configured on his or her computer. And you must be able to find that person on the Internet. As mentioned in Chapter 1, each Internet user has a

SAMSUNG EXHIBIT 1017, Page 74

unique IP address that uniquely identifies the machine on the global network. An IP address is similar to a phone number, but with one twist: most people who use a modem to connect with the Internet will have a *dynamic address*, which means that their address is different every time they log on. As a result, calling people you know can be difficult.

The solution to this problem is called a *directory server*, which is a centralized software program that has a static address where everyone meets. When you start NetMeeting, it can log on to a directory server to announce to the world that you're online and ready for a connection. All your personal information, such as name, location, current IP address, and so forth, is sent to this server. This way, other NetMeeting users can correlate your name with the current IP address of your computer. As you will see later in this chapter, you can configure the address of the server that you use, as well as whether your name is published.

By default, you will be logged on to a public directory server at Microsoft, as mentioned in the previous chapter. If you are interested in setting up your own Internet Locator Server (ILS) then you should read Chapter 13, "Setting Up Your Own NetMeeting Place."

There are some security issues relating to using NetMeeting on the Internet, but using NetMeeting on a network has many advantages that, in most cases, outweigh the security risks. Chapter 10 covers the security concerns relating to NetMeeting. If you're planning to use NetMeeting on the Internet, you'll find thousands of other people just like you using NetMeeting that you can connect with.

This is another aspect of this application—you can meet other people from around the world in cyberspace! Recently a couple met online through NetMeeting and got married in Las Vegas, so the possibilities are endless. The people you meet on a network can also help you learn how to use NetMeeting.

Using an Internet Service Provider

As mentioned in Chapter 3, an Internet service provider (ISP) delivers Internet access to your computer. An ISP can be a mom-and-pop provider in your local area or a large corporation, such as a long-distance or local telephone company. Locating a provider and getting connected to the Internet is beyond the scope of this book; I'll assume that you already have an ISP.

Using NetMeeting and an ISP is no different than using your other Internet applications, for instance, your Web browser or email program. Connect to the Internet by using your ISP software. If your Internet software connects to your ISP automatically, you can run NetMeeting, and your connection to the Internet will be established at the same time. Any provider that uses Microsoft Dial-Up Networking for a connection can be configured this way.

When a connection is established with your ISP, you are assigned an IP address that lets you use NetMeeting.

SAMSUNG EXHIBIT 1017, Page 75

Using an Online Service Such as MSN, AOL, or CompuServe

Using a commercial online service provider with NetMeeting is similar to using NetMeeting with an ISP, with a couple of exceptions:

- Typically, a commercial online service has more congestion on its network than a local ISP, which means slower transfer rates (although this may vary).
- In most cases, you'll have to install another piece of software called Winsock (Windows Sockets) on your computer before you can use NetMeeting.

Winsock gives applications on your computer access to the Internet. MSN and CompuServe provide Winsock automatically with their default installation; in fact, CompuServe has been using TCP/IP protocols since its first version of WinCIM (CompuServe Windows software). AOL's latest software also provides Winsock automatically, although it did not prior to version 3. If you have an earlier version, you must go to topic WINSOCK and follow the instructions. You may also upgrade to the 32-bit version of AOL 3.0 and Winsock will be installed for you automatically.

If you're using a commercial online service not mentioned here, find out from its customer service whether Winsock applications are supported. Most do support Winsock, but it may not be installed by during initial setup and configuration.

Using an IP Network That's Not on the Internet

There's only one difference between using a local or wide area network and the Internet: size. The number of people on the Internet is so much greater than on any other IP network.

Size has its advantages and disadvantages. On one hand, you can have a NetMeeting session with anyone in the world on the Internet; on the other hand, on any other IP network, you can connect with only those NetMeeting users on that particular network. The amount of people (millions!) using the Internet causes competition for the same resources and "bottlenecks" of data throughput.

On a private network, competition and bottlenecking can be managed more easily because you or your network administrator have complete control over who is on the network, what the topology is, and how much bandwidth is available. This may not always be true, however, on a larger office network, where hundreds or even thousands of people compete for LAN resources, which can also create bottlenecks. This causes audio to break up, video quality to degrade, or data transfers to stop for periods of seconds to minutes.

SAMSUNG EXHIBIT 1017, Page 76

The Internet is like a series of pipes. When more water tries to flow through a pipe than it can handle, water (or data, in this case) backs up. So it will take longer for your data to get where it's going. With a modem-to-modem connection (available in earlier versions of NetMeeting), you did not have to be concerned about any fluctuation of available bandwidth because the line was dedicated for your purpose.

So what's being done about this problem on the Internet? There are several initiatives, from simply making the pipes bigger to creating and implementing new network protocols that reserve a portion of the network bandwidth for your data (RSVP). You may be able to tell the network to save you a certain amount of bandwidth and consequently pay for it.

In most cases, using a private IP network provides greater performance than using the Internet. Even if you're dialing onto your corporate LAN or private IP network, you'll notice that all data transfers and activity within NetMeeting are more responsive. Dialing into the corporate LAN with NetMeeting is a great way to work from home. You can carry on a conversation, share applications, and video conference with coworkers at the office or fellow telecommuters.

If you aren't dialing into an IP network, you'll be using NetMeeting on the LAN. Your computer must be configured with a network card and Windows must be set up properly for a LAN connection. The network also must be configured for TCP/IP protocols. See your network administrator for details about TCP/IP and your network before using NetMeeting. on a LAN.

Using the LAN provides the greatest performance for NetMeeting, because a lot more bandwidth is available on your LAN than any other place. A typical network operates between 6 and 10 Mbps, which is about 300 times faster than your 28.8 Kbps modem.

You'll also have to consider that NetMeeting will add network traffic to your network. If your network is already congested, running NetMeeting may not be a great idea; in most cases, the network traffic that's already taking place is more important than using NetMeeting. You should figure that each NetMeeting conference can take up to 250 Kbps (when using video) of your network's available bandwidth per active session on the network. (Your administrator can set the limitations of bandwidth usage through the Windows systems policy editor.)

TIP

If you're video conferencing, remember to look halfway decent. You don't want your coworkers to see you in your pajamas when you're working at home!

SAMSUNG EXHIBIT 1017, Page 77

The amount of needed bandwidth varies during a NetMeeting session, depending on the video settings, audio settings, and session activity with application sharing. See Chapter 6, "Working with Audio," and Chapter 7, "Video Conferencing" for more information on these settings and a more in-depth discussion of bandwidth. The more active the participants are in the session, the more bandwidth will be required. If several applications are being shared and a lot of activity is happening on the Whiteboard, more network bandwidth will be needed.

Network topology and architecture can be very important aspects if NetMeeting is deployed across your entire network. This is especially true if the network has more than 50 workstations. Routers and network bridges can be used effectively to segment and isolate network traffic from one part of the network to the next.

Finding Someone on the LAN

You learned how addressing can change every time you connect to the Internet. You might think that if you're using a LAN, dynamic addressing doesn't hold true. However, if your network is configured with a DHCP (Dynamic Host Configuration Protocol) server, your machine can have a dynamic address. If not, your address is static, which makes establishing NetMeeting connections on the LAN much easier.

You don't need to know the exact IP address of another computer on your network if it has been properly set up with Domain Name Service (DNS), which is a central clearinghouse of all domain names. In this case, each computer on the network has been assigned a unique name. To translate a name that users can understand more easily than the four-part IP address (A.B.C.D), consider this example: If your computer is named hotrod and the domain is widget.com, other users can call you by using the address *hotrod.widget.com*. Even if your computer is configured with a dynamic address, using a host address will work every time.

NetMeeting is designed to work with the Internet Locator Service (ILS) that makes finding others on your network very easy. This is server software written by Microsoft that runs on Windows NT Server. When the ILS is set up, every NetMeeting PC on the LAN logs itself on to the ILS with a name and address. This way, your NetMeeting software can translate a name to an IP Address. See Chapter 13, "Setting Up Your Own NetMeeting Place," for details about setting up an ILS server on your network.

Finding someone on your LAN is the most difficult part of setting up a NetMeeting session. It may take some time to first establish a session on your LAN, but after that it's like riding a bike—you'll never forget.

SAMSUNG EXHIBIT 1017, Page 78

Connecting with Other IP LAN Users

After you establish how your network is configured, connecting to other LAN users is the same as connecting with the other methods. The main difference is the syntax of the address that you enter into the New Call dialog box (discussed in the next section). You can connect to others on the LAN by using an IP address in the form of A.B.C.D, by using a host address such as hotrod.widget.com, or by using an ILS server on your LAN. The previous section described the differences between these three. It's important to understand these differences.

> **TIP**
>
> After you make a connection with someone on the LAN, you may want to add them to your SpeedDial list so that calling them is easier. The SpeedDial feature is discussed later in this chapter.

CONNECTING WITH NETMEETING ON THE INTERNET OR CORPORATE LAN

Now that we've covered the different types of connectivity that NetMeeting supports, it's time to place your first network call. The interface and use of NetMeeting is pretty much the same, no matter whether you're using a modem to connect to the Internet or using a LAN connection on a private network. This section talks about the connection interface. There are two basic types of calls: calls to someone you've never called before and calls to someone that you have called before. NetMeeting provides a speed dialer for making connections of the second type easier.

The address of a call can originate from three sources: an Internet Locator Service (ILS), from the SpeedDial directory, or it can be typed in manually. Using an ILS is the most common way to connect with someone over NetMeeting and also one of the easiest. The ILS can provide a Web interface that generates a Web page from which you can place a call.

The SpeedDial directory is generated as you make calls. It provides an easy way for you to call those people that you frequently need to contact. Each time you place a call, you have the option of adding that person's address into your SpeedDial directory.

You can also enter an address manually. This is the most difficult method of the three because it involves physically typing in the address, as well as researching it.

SAMSUNG EXHIBIT 1017, Page 79

When typing an address manually, NetMeeting can determine automatically whether to use a directory server or a TCP/IP address because each of these two methods has a different syntax.

Manipulating the New Call Dialog Box

If you're using an ILS to make your first call, you should skip to the next section. The first step in placing a call over a non-Internet network is to use the New Call dialog box (shown in Figure 4-1). This dialog is accessible from the main menu (Call, New Call) or by clicking the Call button on the top toolbar.

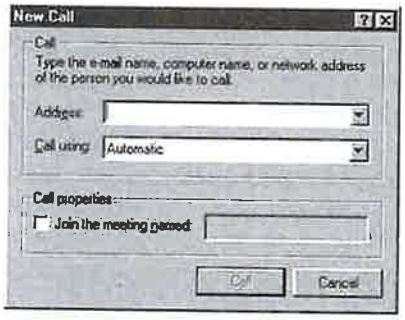


Figure 4-1. *You can manually enter the address of the computer you are calling in the New Call dialog box.*

As you can see, this dialog box consists of two frames, the Call frame and Call Properties. At this point, you're most interested in the Call frame, which is the top frame in the dialog box. This frame contains an Address pull-down list and a "Call using" pull-down list.

The Address pull-down list shows the previous calls that you've made with NetMeeting and also servers with any addresses that you entered manually. Think of an address as a phone number. This may be a bit confusing since it can be one of three different formats: IP address, host address, or ILS address. The following table shows the format of each:

ADDRESS FORMATS

Type	*Format*	*Call Using*
IP address	A.B.C.D	Network (TCP/IP)
Host address	computer.domain.com	Network (TCP/IP)
ILS address	ils.*domain*.com/*username*@*domain*.com	Directory server

The "Call using" pull-down list shows the supported address format types. You can choose to let NetMeeting figure out what kind of address is being

SAMSUNG EXHIBIT 1017, Page 80

entered by selecting Automatic in the "Call using" pull-down list, or you can explicitly state what format to use. This can be helpful if you want the computer to check your formatting. For example, if you enter a host address and have "Call using" set to directory server, NetMeeting will tell you that there's an error in the format of the address you're using. If you alternate between different formats, then select Automatic. This will work just fine for most users.

If you plan on joining a multipoint conference, the Call Properties frame will interest you. (See Chapter 9, "Hosting a Group Conference" for information on hosting a multipoint conference.) To join a meeting, you'll need to know the address of the person who initiated the meeting and the name of the meeting. This is typically determined before the meeting by a moderator of the conference. Meetings of this type involve several people and require planning. Time, date, and even place will have to be established in advance. Place? Yes the place is a virtual place that consists of an address and a meeting name.

Choosing a Name in the Directory List

Most users of NetMeeting, including me, use the directory list to find someone to connect to. Several references have been made to the ILS server so far in this book, but I have yet to explore it in great depth. Now it's time to show you what's involved on your side of an ILS server.

First, you'll configure your directory information. You may have already seen a listing on your screen from the default ILS (ils.microsoft.com). During the installation, a default server was chosen for you and you entered all your information, which is sent to the ILS server (see Chapter 3, "Installation"). Now I'll go into detail about each configuration option and what it means.

If you choose, all your information can be posted on a public ILS. You may also choose to use a private ILS or not have your information posted for others to see at all. In Chapter 3, you entered your first name, last name, and email address. You also entered your city, state, country, and a comment about yourself. All of this is seen by other NetMeeting users and can be changed by you at any time in the NetMeeting Properties, My Info tab. Using your correct email address is important because many features of NetMeeting rely on an accurate email address. If you're using NetMeeting on the Internet for fun, you can get creative with your name and comment. But in a business environment, it's best to be conservative because Big Brother may be watching.

Now on to those options that affect the directory functions. On the NetMeeting Properties dialog (Tools, Options), select the My Information tab. This is shown in Figure 4-2. You can also change your information by selecting Call, Change My Information. Both do exactly the same thing, but the second method involves fewer mouse clicks.

SAMSUNG EXHIBIT 1017, Page 81

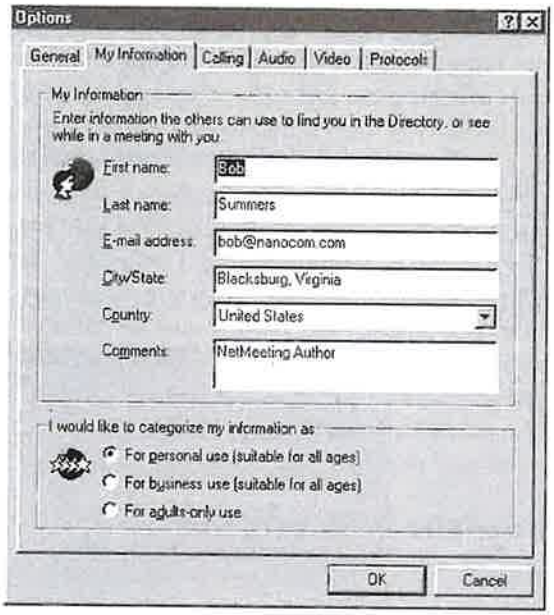


Figure 4-2. *All your personal information is entered on the My Information tab of the NetMeeting Properties dialog. This information is sent to other NetMeeting users.*

Other users can contact you only if you're logged on to a directory server (ILS). As mentioned, NetMeeting will automatically log you in to a directory server. In some situations, you may not want to be logged in automatically. You may want to start NetMeeting and then select a directory server. You must, however, log on to a directory server to use any of the directory services. This includes allowing other people to connect to you through the directory list.

> **NOTE**
>
> You can only be logged on to one directory server at a time. However you can look at user listings of other directory servers.

Whether you log on automatically or not, you'll need to select a default directory server. This option is located on the Calling tab of the NetMeeting Properties dialog and is shown in Figure 4-3. The "Server name" pull-down list shows the available servers. If you're using a ILS server on your corporate LAN, enter that server address here, otherwise select one of the servers that are listed for you. NetMeeting will keep a record of the previously used ILS server addresses and

SAMSUNG EXHIBIT 1017, Page 82

present them in this pull-down list. The address you choose here will be used as a Call menu item on NetMeeting's main menu bar . You can interactively log on and off of the directory server using the "Log On/Off to ils.domain.com" menu item. If you're now logged on, the menu item will allow you to log off, **otherwise** it will allow you to log on. The server name that you select in the Directory tab will be used in this menu item in place of *ils.domain.com*.

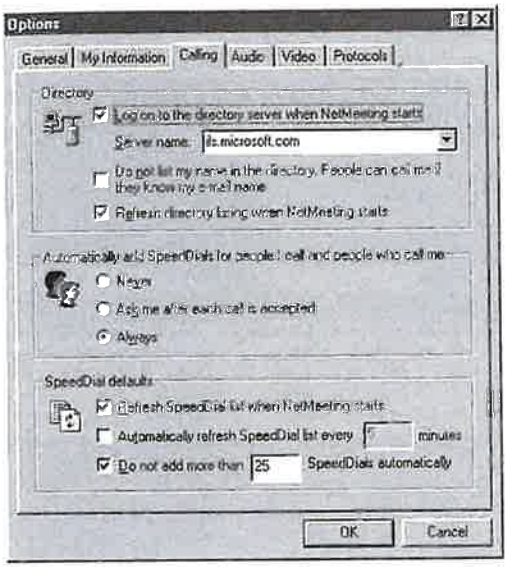


Figure 4-3. *The default directory server is located on the Calling tab of the NetMeeting Properties dialog.*

If you want to log in to a different server while you're running NetMeeting, then you must change it in the Directory tab. Even after you switch directory listings, you'll remain logged in to the server that's specified in the Directory tab. The bottom right corner of the NetMeeting user interface shows your ILS log-on status. The status may be one of the following: Not logged on, logging on to ils.domain.com, or logged on to ils.domain.com.

There is a second option in the Directory area on the Calling tab that determines whether your name will appear on the publicly published directory list. If you select this option, then your name will *not* be listed on the directory server. Others can connect to you by using the directory server address format of *ils.domain.com/john@widgets.com*. This allows you to meet online with specific users, without letting other people on the Internet know that you're online. Remember that thousands of people using NetMeeting around the globe also have access to public ILSs. Depending on why you're using NetMeeting, you may choose not to have your name published on the list.

SAMSUNG EXHIBIT 1017, Page 83

The third option in the Directory area, "Refresh directory listing when NetMeeting Starts," enables NetMeeting to get a new list of online users when the program starts. I recommend that you leave this option enabled. If you disable it, you will not have an accurate idea of who is on the ILS server when you start NetMeeting.

Now that we've covered NetMeeting's directory server options, let's take a close look at the directory listing, as shown in Figure 4-4, and describe what all the columns and icons mean.

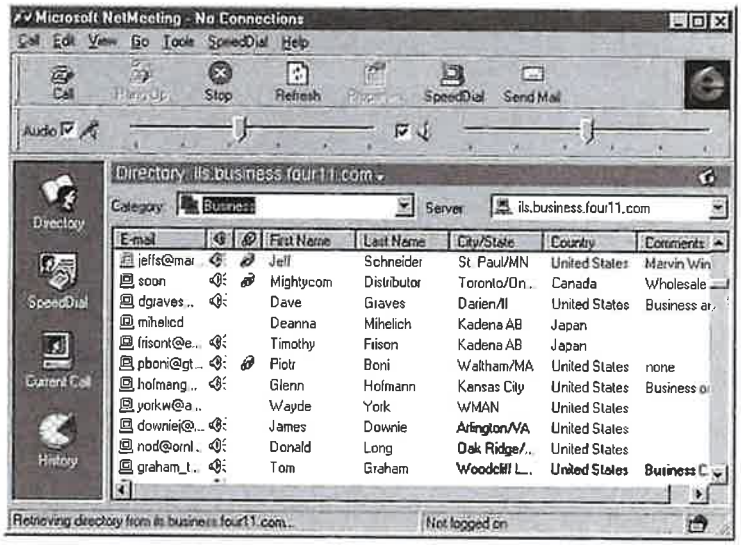


Figure 4-4. *A directory listing shows all the active users that are logged onto the ILS.*

A directory listing consists of nine columns and many rows. Each row represents a user that has logged on to the ILS Server. If you're logged on to one of the public Microsoft ILS servers, you might see several hundred people online from all around the globe. The columns in each row, from left to right, represent Connection Status, Email Address, Audio Capable, Video Transmit Capable, First Name, Last Name, City/State, Country, and Comment. The first time you run NetMeeting, the list will be sorted in ascending order based on email address. You can sort the list by any of the columns simply by clicking the header of that column. If you chose to list your name on the directory, you should be able to find your name on the list. The sorted list will help you find someone online when there are many people to sift through. Most of the icons are self-explanatory, but a couple may be confusing to new users.

The Connection Status icon shows whether the user is currently in a call. If the top left corner of the icon has a red highlight, this person is in a NetMeeting session and may not be available to have a session with you. Otherwise, he or

SAMSUNG EXHIBIT 1017, Page 84

she isn't communicating with anyone else and you can connect to them. They may also allow you to join a multipoint conference, even if they are in a session. (See Chapter 9, "Hosting a Group Conference" for more information on multipoint NetMeeting sessions.)

The Audio Capable icon indicates that the user's computer has audio hardware. It doesn't necessarily mean that their audio functions are working properly, but it's a good indication that this person can use the audio features of NetMeeting. Both users in a NetMeeting session must have audio hardware to use any of the audio features. When the yellow speaker is present in this column, the NetMeeting user has audio capability.

The Video Transmit Capable icon indicates that video capture hardware is present on the user's computer. Again, this doesn't necessarily mean that their video functions are working properly, but does indicate that this person can transmit video. Every NetMeeting user can receive video, but only those with video capture capability can capture and send video. When the camera is present in this column, the NetMeeting user has video transmit capability.

An additional feature that helps you locate other users is the query pull-down list. This is located in the top left corner of the directory listing and is shown in Figure 4-5.

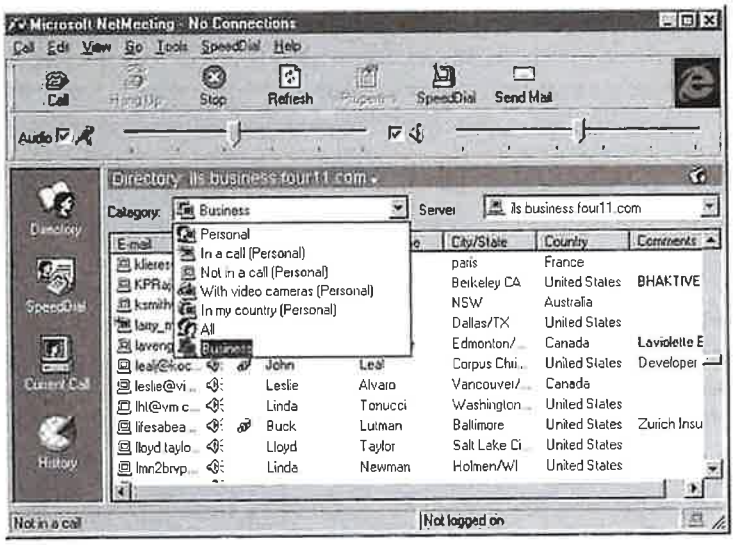


Figure 4-5. *The query pull-down list allows you to specify a group of users to be displayed on the list.*

Select one of these queries to narrow down a long listing. If you want to talk only with people who have video, select "With video cameras". This is pretty simple stuff. Believe it or not, it's designed to be that way!

SAMSUNG EXHIBIT 1017, Page 85

TIP

On the top right corner of the directory display you'll find the ILS pull-down list. This shows the most recent directory servers that you've visited. When you first install NetMeeting, six Microsoft ILS servers are listed in this box. These are public ILS servers that you can use, but remember that there are many people using them. Click the pull-down arrow and a list of available ILS servers will be shown. You can also type an address into the box in A.B.C.D or ils.domain.com format. All ILS servers use the TCP/IP protocol and require this address format.

Choosing a User with the Web Directory

Every ILS *server can also provide* its directory listing as a Web directory. The address of the Web directory is in the format of http://ils.*domain*.com. Using this directory with a Web browser may be an easy way for you to start up NetMeeting. When you select a link that points to a NetMeeting user, NetMeeting will automatically run on your machine and call that person. There's no difference between clicking a Web directory link and using the directory listing that's in NetMeeting. It's just another way to provide connectivity. If you haven't noticed, there are many ways for NetMeeting to call someone.

One significant difference between a directory listing and a Web directory is that the latter allows you to create a static link to a NetMeeting user on your Web site. The ILS will maintain a dynamic listing on its own, but you may want to put a list of links, or perhaps just your own address, on a Web page.

Here is some sample HTML code that will cause NetMeeting to run when a person clicks the hyperlink. One important note: the user must have NetMeeting installed for the link to run the program. This may be pretty obvious, but it can be easy to forget that not everyone has the same software that you do. The following HTML HREF code will cause a browser to start NetMeeting and call "John":

```
<A HREF="http://ils.domain.com/
ilserver.dll?act=res;uid=john@widgets.com">Call John</A>
```

This will only work on a static Web page if john@widgets.com is always logged onto the ILS server ils.domain.com. Otherwise NetMeeting will return an error indicating that it couldn't connect to John.

SAMSUNG EXHIBIT 1017, Page 86

Calling Someone on the Internet Without Using a Directory

So far, you have seen that using a directory is the easiest way to make a NetMeeting call on the Internet. There's another way to establish a connection on the Internet that may prove difficult to the average user, but suitable for a more advanced user. A call can be made by typing the IP address or *host name* of the remote computer into the New Call dialog box. The format of this address is A.B.C.D (12.34.56.78) or machine.*domain*.com. The only information you need to know is the address of the remote computer.

Why would you want to do this? In a closed corporate or private LAN, you might not have access to the Internet. But, you still want to test out the features of NetMeeting and see if it's worth creating a ILS server on your LAN. This method allows you to connect NetMeeting clients together without installing or having access to a directory server. Or, privacy may be important to you and you may not want to log onto an ILS server using the Internet. To connect in this manner with a dynamic IP, you may have to use a utility that tells you your IP address.

TIP

Windows comes with a utility called WINIPCFG that will report the IP address of your computer. To run this utility select Start, Run and type WINIPCFG.

Receiving Calls

One of the easiest features of using NetMeeting is receiving calls. NetMeeting is automatically ready to receive a call as soon as you run it. Just like your traditional telephone, it's constantly "listening" for any incoming calls. Your home telephone rings when it receives an electrical impulse, and NetMeeting will ring when it gets a request on the network for a connection.

A couple of different things can happen when NetMeeting detects a call. If your computer is equipped with a sound card and speakers, then you'll hear a ring, not unlike your phone. On the bottom right corner of the screen a dialog box, as shown in Figure 4-6, will ask you if you would like to accept a connection from someone. This is similar to CallerID, because you'll know who is calling before you answer. You can choose to take the call or not.



Figure 4-6. *NetMeeting notifies you of incoming calls and allows you to decide whether you want to accept the connection.*

SAMSUNG EXHIBIT 1017, Page 87

If you choose yes, then the call is completed and the other person will join you in a NetMeeting, otherwise the caller will be notified that you're not available. In some cases, someone will call you when you're already in a session. In this situation, the caller will be notified that you're busy.

NetMeeting lets you choose from three options to accept calls: Do Not Disturb, Auto Accept, and Auto Start. If you don't want to be bothered, you can either close NetMeeting or enable the Do Not Disturb option by selecting Call, Do Not Disturb from the main menu. A checkmark to the left of Do Not Disturb indicates that NetMeeting won't ring if someone attempts to call you.

Auto Accept will remove the dialog that asks your permission for the connection. Check this option if you would like to automatically accept calls. You can find it on the General tab of the NetMeeting Properties dialog. This setting is often helpful if you have an unattended station that you would like to see or hear from a remote location. In this situation, no one is at the computer to click yes to accept the call. Generally, you don't want to use the Auto Accept feature, because it's more convenient to know who you'll be talking with before you answer.

This option is very helpful if you're using a computer that is always connected to the Internet or a LAN. NetMeeting can automatically run when Windows starts and wait for calls. If you have a dial-up Internet connection, then in most cases, the connection will be automatically established when Windows starts. In this case, NetMeeting opens an Internet connection, which causes your Internet software to dial and connect to your ISP.

When NetMeeting is in this mode, you'll see the small NetMeeting and Intel Connection Advisor (ICA) icon on the task bar. This indicates that NetMeeting is running and waiting for calls. If you double-click the icon, NetMeeting will open and run. To return NetMeeting back to that background state, simply exit NetMeeting using Call, Exit. This won't terminate NetMeeting, it merely returns it to the task bar. You can also right-click the NetMeeting icon and select the Do Not Disturb option.

NOTE

The Do Not Disturb setting isn't saved when you exit NetMeeting, so if you enable it, and then restart NetMeeting, it will be disabled. Simply reset it if you need to.

SAMSUNG EXHIBIT 1017, Page 88

The ILS Servers You Should Visit First

The ILS server software runs in conjunction with the Microsoft Internet Information Server on a Windows NT Server. It is available to download at no charge from the NetMeeting Web site on the Internet. Since it is so accessible, a number of people and companies have set up ILS servers that are available to the public. The following table lists a few that are worth mentioning.

INTERNET LOCATOR SERVICES

ILS Name	*Where*	*Description*
ils.microsoft.com	Redmond, WA	Main ILS server at Microsoft (very busy)
ils.sitebuilder.net	Maryland, USA	Webmasters who use Microsoft technologies
ils.netmeet.net	Sunnyvale, CA	NetMeeting Place server
ils.four11.com	USA	Another big public server
ils.family.four11.com	USA	Server for family users
ils.business.four11.com	USA	Server for business users

WEB ALERT

You also can check out http://www.netmeet.net/ilslist.htm for a comprehensive, up-to-date list of ILS servers.

USING NETMEETING'S SPEEDDIAL

The most efficient way to keep track of people that you call all the time is with NetMeeting's SpeedDial feature. This feature will store any address that you want for easy access. This entry can be added manually or NetMeeting can add it automatically. As with every other function in NetMeeting, there are a number of options for SpeedDial; these are also located on the Calling tab of the NetMeeting Properties dialog box. Select Tools, Options, and then select the Calling tab to see the SpeedDial options, as shown in Figure 4-7.

SAMSUNG EXHIBIT 1017, Page 89

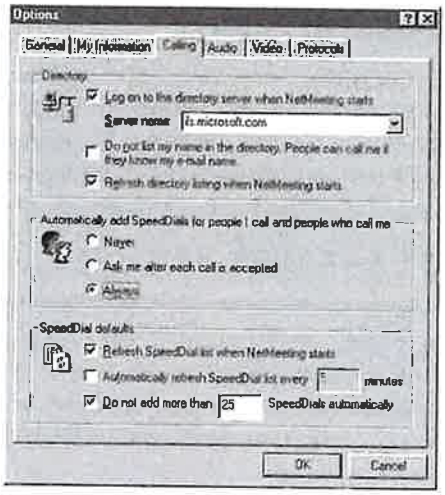


Figure 4-7. *SpeedDial options are shown on the Calling tab of the NetMeeting Properties dialog.*

Setting the SpeedDial Options

The SpeedDial section on the Calling tab consists of two frames; the first applies to automatic entries and the second has some general settings. When you make a connection with someone, NetMeeting can take one of three actions with the address of the call: nothing at all, ask you if you want to add the address to your SpeedDial list, or add it automatically. The choice is purely a matter of personal preference.

NetMeeting's default is to automatically add all names to your Speed Dial list. I would suggest that new users set NetMeeting to ask whether a person should be added to the SpeedDial list. Otherwise, you may end up with a huge SpeedDial list that you'll have to clean out. Select the option that works best for you.

There are three settings in the General frame of the SpeedDials tab. The first two concern refreshing the SpeedDial list. NetMeeting can go out and check all your SpeedDial addresses to verify the online status of each one. This way, when you look at the list, you can determine who's online. This is a handy function that will save you the trouble of manually determining if each person is online. Imagine if you could know whether a person was home before you dialed their phone number! The online status of each of your SpeedDial entries is indicated on the SpeedDial tab on the main user interface. If you would like NetMeeting to check the status of each entry when it loads, then select "Refresh SpeedDial list when NetMeeting starts".

Of course, as you're conferencing, people on your SpeedDial list will go online, offline, enter sessions, and so forth. NetMeeting can go out at a specified interval (in minutes) to check the status of all the entries on your SpeedDial list.

SAMSUNG EXHIBIT 1017, Page 90

Check the "Automatically refresh SpeedDial list every X minutes" to enable this feature. Fill in the X with an interval in minutes. The lower the interval, the more often NetMeeting will check the status and the more work your computer must do. The default value of 5 minutes is a good interval to use. If you don't want NetMeeting to check the status as it's running, don't select this option.

NOTE

If you've disabled "Refresh SpeedDial list when NetMeeting starts" and "Automatically refresh SpeedDial list every X minutes", the status of your SpeedDial entries won't be known and this will be indicated by a status of Not Available. Enable at least one of these option to get SpeedDial status information.

The automatic refresh option can help you keep the SpeedDial list under control if you have enabled NetMeeting to automatically add SpeedDial entries. The last option, "Do not add more than X SpeedDials automatically", will limit the number of SpeedDials that are added. Remember: the more entries you have on your list, the more work NetMeeting has to do when it refreshes the status of each SpeedDial. You want to keep the number of items on this list to a minimum. If you're on a LAN or high-speed network, this may not be a concern, but in most cases, you'll slow down NetMeeting performance by having a long SpeedDial List.

Managing the SpeedDial List

If you know the address of someone that you want to add to your SpeedDial list, you can add it manually by bringing up the Add SpeedDial dialog window. Click the SpeedDial button on the main toolbar, choose SpeedDial, Add SpeedDial, or choose Call, Create SpeedDial to bring up the dialog shown in Figure 4-8.



Figure 4-8. *Adding a SpeedDial.*

SAMSUNG EXHIBIT 1017, Page 91

Simply enter the address in the proper format and select the correct protocol in the SpeedDial Information frame. See the section on address format earlier in this chapter for more information about valid formats. When the SpeedDial is created, you can add it to your SpeedDial list, send it via email to someone, or save it to your desktop. When you add it to your SpeedDial list, it will be displayed on the SpeedDial tab in the main NetMeeting window. If you send the SpeedDial to someone via email and they have NetMeeting installed, they can initiate a NetMeeting session directly from that email message. That SpeedDial entry has become a hyperlink to a NetMeeting user. Or, you can place the SpeedDial entry on your desktop for easy retrieval in the future. I keep the number of desktop SpeedDials to a minimum, because they can clutter your desktop.

To call someone on your SpeedDial list or to use the desktop SpeedDial, simply double-click the SpeedDial of the person you want to call and NetMeeting will create a connection.

If you want to delete a SpeedDial entry, Highlight the entry and press the Del key on your keyboard. It will instantly be thrown into the bit bucket.

> **CAUTION**
>
> NetMeeting doesn't confirm when you delete a SpeedDial entry. You can't recover a SpeedDial entry after you remove it from the list.

CONNECTION: WHAT HAPPENS NOW?

By now, you should be able to use any of the connection options I have outlined to click on a name on the directory listing or enter an address. Once you do this and your connection request is accepted by the other party, you are officially connected with NetMeeting. It's time for *congratulations!* You've successfully made your first NetMeeting connection and you're well on your way to becoming a technocybergeek.

Depending on the capability of your computer and the other person's PC, once you're connected, you'll be presented with a number of options. You'll notice that NetMeeting's interface will automatically change to the Current Call tab. On this screen, you should see your name and the name of the person you are conferencing with. You'll also have the option of using NetMeeting's tools including text Chat, Whiteboard, application sharing, file transfer, and audio and video conferencing. Separate chapters in this book detail each NetMeeting tool.

SAMSUNG EXHIBIT 1017, Page 92

When a tool is run by either user during the session, it's displayed on both sides of the connection. For example, if you run the Whiteboard and the other person doesn't have the Whiteboard running, it will be loaded automatically. If you're using audio and video, then the interface for that appears. Audio and video are the most difficult of the tools to set up and configure properly. Don't be discouraged if you can't get the audio or video working perfectly the first time you use them. See the chapters on audio conferencing, video conferencing and troubleshooting if you can't get these functions to work. It will be worth your time and effort, especially since you can save money on long distance calls.

When you're finished with a call, click the Hang Up button on the main toolbar or choose Call, Hang Up on the main menu. You've now completed a NetMeeting call from setup to hang up and you've found an easier way to connect with your friends, colleagues, and relatives. But first you'll have to install NetMeeting on all their computers and get them on the Internet!

ALTERNATIVES WHEN CONNECTING PROVES DIFFICULT

Sometimes it may be difficult to connect with someone online. Many variables are involved if you want to meet a specific person on the Internet at a certain time. Time zone, computer trouble, the ILS server, and scheduling are just a few of obstacles that you'll run into when trying to set up a meeting. There are several alternatives to simply using the ILS server. You can call someone on the phone before the meeting, send email, page them, or use any other communication to signal that you're ready to have an online meeting. What's important is planning. Plan to meet at a certain time and certain place. The place is the ILS server and you'll have to remember the time difference if the other party isn't in your time zone.

FROM HERE...

In this chapter I have shown you how to call another NetMeeting over the Internet and corporate LAN. Now that you are connected, you can take advantage of the many features that NetMeeting has to offer.

You can read about these features in the following chapters:

- Chapter 5, "Chat and Whiteboard," shows how to use the Chat and Whiteboard features of NetMeeting to send interactive text and collaborate on a virtual whiteboard.

SAMSUNG EXHIBIT 1017, Page 93

- Chapter 6, "Working with Audio," discusses how to add audio conversation to your NetMeeting session.
- Chapter 7, "Video Conferencing," covers adding video to your session. Video conferencing can be a very exciting feature because you can see the person you're talking with.
- Chapter 8, "Application Sharing and File Transfer," outlines how a group of users can share applications. You can interactively work on the same documents and presentations with this feature.

SAMSUNG EXHIBIT 1017, Page 94

Part II

Using NetMeeting's Features



Chapter 5

Chat and Whiteboard

In this chapter, you will learn:

- **Where, how, and when to use NetMeeting's Chat and Whiteboard technologies**. These features add value to any business presentation by giving you other ways to communicate your ideas.
- **How to use NetMeeting's Whiteboard, tool by tool**. Whiteboard has a lot of tools, making it seem overwhelming at first, but it takes only a few minutes to explore its tool set and start on the right path.
- **How to wow your NetMeeting partners with screen captures, graphics, and photographs**. NetMeeting is really a multimedia tool, not just a "telephone replacement." Learn how to use NetMeeting's full capabilities to make your business communications really shine.

NetMeeting's most powerful features are its collaborative tools, which enable you to communicate and work together more effectively with other people. The Whiteboard, for example, which seems simple and is often overlooked, can be a

SAMSUNG EXHIBIT 1017, Page 97

powerful addition to your business communication tools. Likewise, the Chat technology (which seems primitive—especially when compared to the video and audio technology in NetMeeting), is the best way to send lists of data to your NetMeeting partners. Both the Whiteboard and the Chat technologies are among the few features of NetMeeting that don't require any special hardware beyond a 486 PC. So if you don't have a sound card or a video capture device, you'll still be able to communicate using these features. In addition, the Chat feature enhances the way hearing-impaired individuals can communicate in real time.

You're finally ready to explore why NetMeeting exists—using the multimedia capabilities of your PC to communicate in real time with another human being. By now, you should have installed NetMeeting, set it up, and connected with another computer.

USING THE CHAT FEATURE

Even if you don't have a sound card or video capture device, you can communicate quite effectively with the text Chat window and the Whiteboard. You will find that the Chat and Whiteboard features are an important part of NetMeeting.

In addition, if you have more than two people in a NetMeeting (there can be multiple people in a single meeting), the only communication features that will work among all participants will be Chat and Whiteboard.

The Chat window is also useful during video and audio conferencing because it enables you to pass URLs and other text information back and forth. Using text to keep a list of "to do" items or your grocery needs are other examples of how NetMeeting's Chat window is an improvement over a voice-only system such as the telephone. After all, how often have you incorrectly written down a phone number or an address when using the phone? With NetMeeting, that will never happen.

You might wonder why I want to spend time exploring NetMeeting's Chat feature, for upon initial examination, it appears to be very simple to use. Taking a second look, however, I discovered that although nearly everyone uses Chat's simpler functions, very few people try its more advanced features. Have you had a "private" conversation in a group, for instance? Or have you changed the look of the Chat window? You can do this and much more if you learn to use Chat's advanced features.

Another problem is that experienced chat users tend to use online jargon, resulting in communication problems (many times, less experienced users won't ask for clarification because they are afraid of appearing stupid).

A short list of chat emoticons and abbreviations follows. There are entire books on emoticons, but only a few common ones are regularly used.

SAMSUNG EXHIBIT 1017, Page 98

EMOTICONS FOR CHAT

Emoticon	*Explanation*
:-)	Author is happy.
:-(	Author is sad.
:-0	Author is surprised.
;-)	Author is winking at you.

COMMON CHAT ABBREVIATIONS

Abbreviation	*Explanation*
<ROTFL>	Rolling On The Floor, Laughing.
<g>	Grin. Use after a sarcastic comment.
<BRB>	Author will "Be Right Back."
<OTOH>	On The Other Hand.
<IMO>	In My Opinion.
<IMHO>	In My Humble Opinion.
<TTFN>	Ta-Ta For Now.
<BTW>	By The Way.

It's this new, rather cryptic language that many in the video conferencing field hope will disappear when we can communicate with our real voices and faces again. With NetMeeting, however, you must use the Chat window when you are conferencing with groups of people, because, as mentioned, voice and audio only work between two people.

NetMeeting has added several features to the Chat window for making communication in groups easier. The most important of these is the capability to type to one specific person so that no one else in a meeting can see your "private" messages. You can do this by holding down the "Send to:" drop-down list box and choosing the person to whom you want to speak. When you want everyone to see your messages again, click the "Send to:" list box again and choose "Everyone in Chat."

Connecting NetMeeting's Chat

To start up NetMeeting's Chat, open the Chat window while in a meeting. When one person opens the Chat window, NetMeeting automatically opens the Chat window

SAMSUNG EXHIBIT 1017, Page 99

for all participants in the meeting. There are three ways to open a Chat window:

- Select Chat on the tools menu.
- Click the Chat button on the Current Call toolbar.
- Hit Ctrl + T on your keyboard while NetMeeting is the active application.

After you open the Chat window, NetMeeting tells you how many other people are connected to you and also who has their Chat window open. For instance, in Figure 5-1, note that the title bar says "Untitled - Chat - Not in call", which means that there is not an active Chat session. If you are in a chat with one other person, the title bar will read "Untitled - Chat - in use by 1 other(s)". Sometimes NetMeeting shows that you are connected with someone else, but you won't be able to send messages to them. I suggest that you wait 20 seconds and try again. Occasionally, NetMeeting must resynchronize itself with the other participants, and that can take a few moments.



Figure 5-1. *The title bar of the Chat window shows how many people are in the chat session.*

After you open Chat, you can resize the Chat window to fit your screen. Unlike application sharing, resizing this window does not affect the size of someone else's Chat window.

Sometimes it's very tempting to close the Chat window. However, you must resist that urge. Make it a habit to either leave the Chat window open on the screen or simply minimize it. Often, if you close the window, you will lose

SAMSUNG EXHIBIT 1017, Page 100

information that you might want to save, and sometimes the Chat window takes quite a while to restart after you've closed it completely. In addition, your partners can't place messages in the Chat window for you if you close it.

Unfortunately, there are a few basic features missing from the Chat window. For example, if a friend sends you a URL, you can't copy or cut only the URL to paste it into your browser's address entry area. You can cut and paste individual lines, but you must do some editing when you paste the line to remove the poster's name and other information.

Changing Fonts and Customizing Chat

You can change the fonts used for displaying messages in your Chat window to give it a distinctive look. Be aware, however, that the fonts won't change in your partner's window. To change fonts, just use the Font menu item from the Options menu on the Chat window. The dialog box that appears enables you to change the font and its size, style, and color as shown in Figure 5-2.

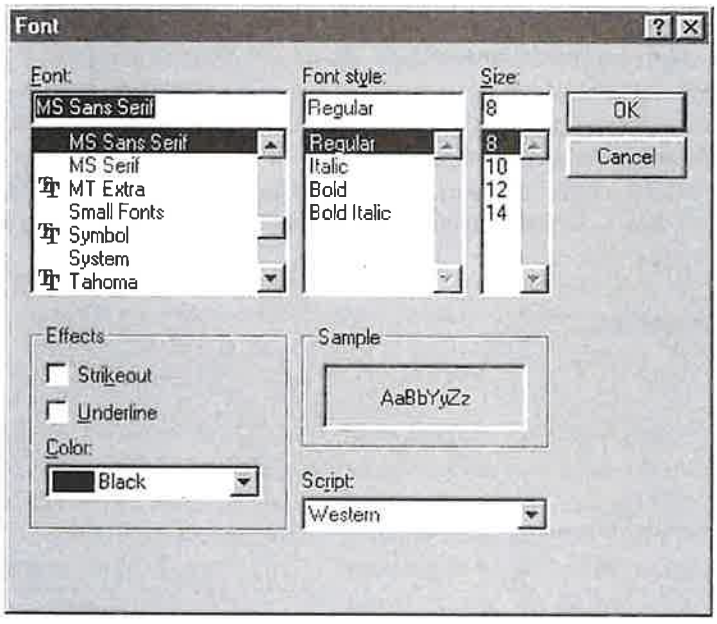


Figure 5-2. *The Font dialog allows you to change the attributes of the text in the Chat window.*

You can perform a more useful customization with the Chat Format selection from the Options menu. This dialog box (Figure 5-3) lets you change the way the contents of your Chat window is displayed, and it also lets you add a date and time stamp to each Chat message. You can also make the text in the Chat

SAMSUNG EXHIBIT 1017, Page 101

window wrap in three different ways. For instance, if you have a high-resolution screen, you might want to make each message appear in a single window.



Figure 5-3. *Customizing the format of Chat text.*

Saving a Chat

If a business partner sends you a list of action items using the Chat window, you'll definitely want to save the list for future reference. Make sure that you save anything important before you close the Chat window because it's easy to accidentally erase information.

To save the Chat window, just use the Save As command and save your file as you would any other: give the file a name, find the folder you want to save it in, and hit OK.

Chatiquette

We touched upon the language of chat, but this form of communication also has its own etiquette, for instance, signing off. Saying goodbye is one of the toughest things to do in a chat room. Some people quietly leave the discussion while others say they are leaving, but actually remain for a while because they are enjoying the electronic conversation and cannot pull themselves away. Typically, a user will warn you when he or she is about to leave by typing something like "Well, I've got to go to bed." Then, when the time comes for the user to truly sign off, she simply types "Bye." Sometimes people continue to say goodbye but hang around, especially if there is a group discussion going on. General etiquette suggests that you warn people you need to leave in, say, five minutes, but when you finally say "bye" you should leave the chat.

Unlike a spoken conversation, an electronic conversation using Chat allows you to "speak" at the same time as others in the conversation. There is

SAMSUNG EXHIBIT 1017, Page 102

nothing wrong with sending a line of text at the same time as someone else. The computer separates the text in a way that you can understand by labeling it with the name of the sender. You can also type a line and change it before sending (the text is not sent until you press Enter). This doesn't mean that you should make sure every word is spelled right, or that every sentence is grammatically correct, because these types of errors are acceptable in a chat session.

USING THE WHITEBOARD

The Whiteboard is one of the handiest pieces of technology NetMeeting offers, but unfortunately, it's probably the least-used feature. The Whiteboard lets you share thoughts and ideas graphically, by drawing on a common surface that all conference participants can see.

Whatever you put on the Whiteboard automatically appears on each of the Whiteboards in your conference. When you have more than one person in a conference, they each will see the same Whiteboard.

The Whiteboard is perfect when you want to draw with your partner or work on a project that requires you to "see" pictures or bitmaps, such as screen captures. It's also useful when you are trying to show graphical relationships between objects.

For example, you can paste pictures, clip art, or screen captures from other applications directly into the Whiteboard for everyone to see. NetMeeting's Whiteboard has two unique and powerful characteristics:

- Every object that you place or draw on the Whiteboard can be moved around or deleted by anyone in the conference. The contents of the Whiteboard can be locked so that others are prevented from changing anything.
- NetMeeting's Whiteboard allows many people to use it at the same time and create multiple pages.

> **NOTE**
>
> If there are many people in one conference, make sure that the person who begins the conference has the fastest computer and the most bandwidth, because the first two computers in a conference act as hub for the rest of the computers.

SAMSUNG EXHIBIT 1017, Page 103

Overview of the Whiteboard

Using the Whiteboard is fairly simple, but there are many valuable features that most people don't use. In the following section, I'll specifically look at the Whiteboard as a business tool.

Consider a NetMeeting user who needs to give a presentation to a remote group of customers. Instead of faxing slides to them, the user could build the entire presentation in NetMeeting's Whiteboard. He can copy and paste pictures from his CAD program, PowerPoint slides, and clip art into the Whiteboard. Every picture that is pasted into his Whiteboard is also sent to all the members of the session.

During the presentation, he can use the Remote Pointer to focus his client's attention on specific items on the Whiteboard. He can use the Highlighter tool to point out important concepts in his text and to highlight areas from a magazine clipping that praised his products.

I'll show you how to do all of this and more. But first, I'd like to give you a general overview of the Whiteboard and show you how to manipulate it.

As shown in Figure 5-4, there are five areas on the Whiteboard:

- **The board**. You can draw, paste pictures, and type here.
- **Menus**. All features can be selected through the menus (most are also accessible from the toolbar).
- **Toolbar**. Select tools to draw, take screen captures, type, and more.
- **Color and font selection palette**. This is where you change color and set font sizes for text.
- **Page selection controls**. These controls enable you to switch pages, add pages, and go to the first or last page.

The Whiteboard's most frequently used controls are located in the toolbar. All of the tools change the behavior of your cursor and enable you to do something different in the drawing area on the Whiteboard. You also can select the tools from the Tools menu. In fact, Microsoft duplicated each tool in the menu, in case you don't like clicking icons.

There is also a third way to select each tool. Right-clicking the Whiteboard's drawing area causes another menu to pop up, allowing you to select each tool. For most people, this is the fastest way to change tools.

> **NOTE**
>
> Make sure that you are familiar with each tool before you use NetMeeting for an important presentation.

SAMSUNG EXHIBIT 1017, Page 104

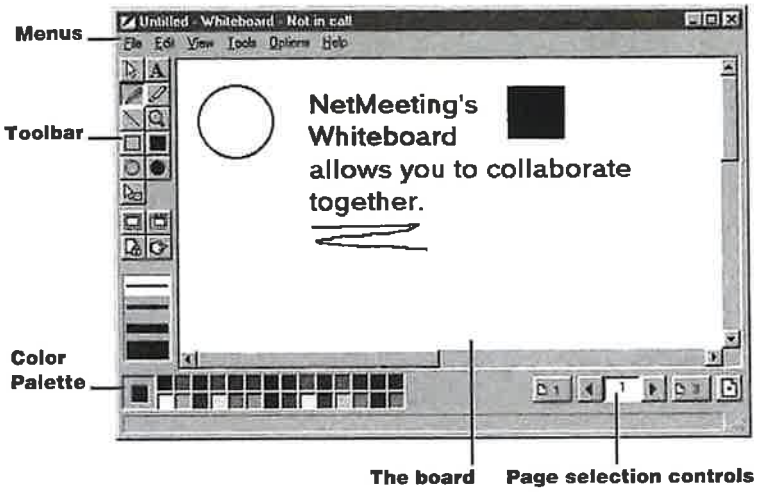


Figure 5-4. *You'll find tools, menus, an entry area, and page selection controls on NetMeeting's Whiteboard.*

The following table provides an overview of each tool.

NETMEETING'S WHITEBOARD TOOLS

Tool icon	*Tool name*	*Tool description*
	Selector	Use this tool to select items and move them around on the Whiteboard.
	Text	Use the Text tool to start a text-entry area on the Whiteboard. It also lets you select text and replace it, or change font size and style.
	Pen	The Pen control lets you write or draw on the screen with your mouse or a stylus-based device like a Wacom tablet.*
	Highlighter	Use this tool to highlight important areas of text in a scanned-in image of a document. It paints over a certain area of the document with a yellow color.
	Line	Use the Line tool to draw a straight line between two points.
	Zoom	The Zoom control toggles between a double-sized view and a normal-sized view. Use this to see details on a photo-graph or to more easily draw detailed artwork.

(continued)

SAMSUNG EXHIBIT 1017, Page 105

NETMEETING'S WHITEBOARD TOOLS *(continued)*

	Shape Tools (4)	These tools (Unfilled and Filled Rectangle, and Unfilled and Filled Ellipse) let you draw squares, circles, ovals, and rectangles.
	Eraser	The Eraser tool lets you delete any item simply by clicking on it.
	Select Window	The Select Window tool takes a screen capture of a window and pastes that capture directly onto the Whiteboard.
	Select Area	The Select Area tool takes a screen capture of any area of the screen and pastes it directly onto the Whiteboard.
	Lock Contents	The Lock Contents tool makes it impossible for another user to move or add anything to the Whiteboard that you are currently using.
	Remote Pointer	The Remote Pointer lets you point to things on the Whiteboard. Each participant has a different colored pointer that only he or she can use.

(*I highly recommend a tablet that uses a stylus for writing on the Whiteboard because it's more natural and similar to using a real pen or pencil. Wacom is the most-recognized maker of tablets that use a wireless stylus.)

In addition to each tool, you can add or delete pages or move between pages with the controls at the bottom of the Whiteboard. Figure 5-5 displays these page controls.

Use the page controls to go back to the first page (first button), move to previous page (second button), move to the next page (third button), switch to the last page (fourth button), or add new pages (fifth button). The text box indicates the active page number and you can manually type a number into this text box. Figure 5-5 shows Page 1 as the active page out of 3 total pages.

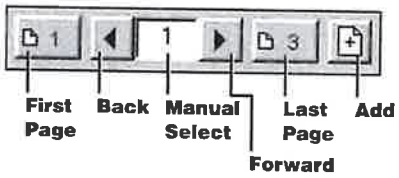


Figure 5-5. *Page controls allow you to move between and add pages in the Whiteboard.*

SAMSUNG EXHIBIT 1017, Page 106

If you have a lot of pages, you might find that using the Page Sorter is a better way to move between pages or drag pages to different presentations. You can open the Page Sorter by selecting it from the Edit menu. In the Edit menu, also note that there are ways to insert pages or to erase everything on a single page. Figure 5-6 shows the Page Sorter.

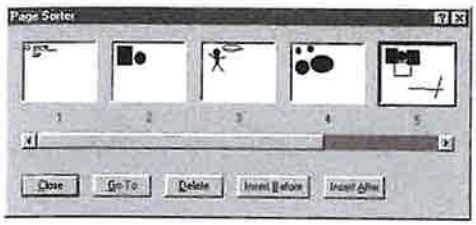


Figure 5-6. *By using the Page Sorter, you can add pages, delete pages, and move pages by dragging them.*

You'll probably resort to using the Page Sorter for longer presentations. It's not easy to drag a page, though, and you might have to practice before you can get it to work properly. As you drag the page that you want to move, watch the cursor change from a "can't drop" image to an "insert page here." I noticed that the "insert page here" image only appears when the cursor was over the small strip between the thumbnail page images.

Now that we've looked at all the tools, a discussion of the working area in NetMeeting's Whiteboard is in order. The Whiteboard is similar to a flipchart that many companies use in meeting rooms, except it's on the computer instead of a stand in front of the room. Since it is electronic, it is much more flexible and can be shared among people all over the world using the Internet. Just the simple ability to save and print the Whiteboard is compelling to most users and can make it easy to realize the power of NetMeeting. The Whiteboard can consist of one or more pages, depending on whether pages have been added or deleted by the members of a session. Each page can have an almost infinite number of graphics, text, and writing. Everything you do on the Whiteboard becomes an object, which you can then erase or move around.

The Whiteboard is not a good substitute for a presentation tool like Microsoft's PowerPoint, by the way. Its strength is as a collaboration tool that can used by several people to simultaneously share ideas through a common electronic drawing area.

You can, however, use it as a presentation tool. You can even take screen captures of your PowerPoint slides, paste them onto the Whiteboard, and "flip" from slide to slide. Just beware, this technique will build a massive Whiteboard and it may take some time to transmit each page. It would be better to use application sharing with PowerPoint, unless you want to give conference users the ability to draw on each page.

SAMSUNG EXHIBIT 1017, Page 107

It's easy to add a page—just click the Insert New Page button on the bottom right corner of the Whiteboard. Using the other tools nearby, you will be able to navigate through the pages you've already added.

To add content to each page, just use one of the tools listed in the previous table and start drawing, typing, or dragging shapes onto the Whiteboard. You can also copy and paste bitmaps (photographs or clip art) onto the Whiteboard. And remember that the Page Sorter is handy for longer presntations.

Using Graphic Images

In business communications, it's very useful to start a presentation with a photograph or some clip art (Dilbert anyone?).

For instance, assume for a minute that you are a graphic artist, and you are selecting photographs for a client to use on her packaging. How would you quickly show the client a wide variety of photographs over the Internet? Why not just paste them into the Whiteboard?

Even if you aren't a graphic artist, you almost certainly will need to show graphics, photographs, clip art, scans of documents, or even user interfaces of applications to other people over the Internet. The Whiteboard is a perfectly simple way to accomplish this. Just copy and paste.

One caveat: NetMeeting's Whiteboard does not compress images very much before sending them across the Internet. Because of this, you will want to shrink the size of some images before placing them on the Whiteboard. Generally, you shouldn't use images larger than 640 pixels high by 480 pixels wide. If your images are larger than that, you'll want to shrink them first.

If you have Adobe's Photoshop or an equivalent image editor, you'll have no problem shrinking the image. If you don't, try opening the image in the Paint program that comes with Windows 95 and NT (it's in the Start menu/Programs/Accessories). If you have a BMP graphic, you will be able to shrink it in Paint, copy it to the clipboard, and paste it into NetMeeting's Whiteboard. (See Figure 5-7 for an example of using Paint with NetMeeting's Whiteboard.)

Any image pasted into NetMeeting's Whiteboard will automatically be sent to everyone who is hooked up to your NetMeeting. Remember, however, there is some delay between putting an image on the Whiteboard and seeing it on the remote computers, so plan on waiting one minute if you or your participants are using 28.8 modems. (A 320 x 240 graphic comes out to roughly 220 KB, which would take approximately one minute to download at 28.8 Kbps. Faster modems, obviously, will reduce the time needed to send large graphics on the Whiteboard.)

If everyone hooked up to you has ISDN or shares your LAN, images should take less than 10 seconds to transfer. You'll probably want to ask people to tell you when they see the image, though, before you begin talking about it.

SAMSUNG EXHIBIT 1017, Page 108

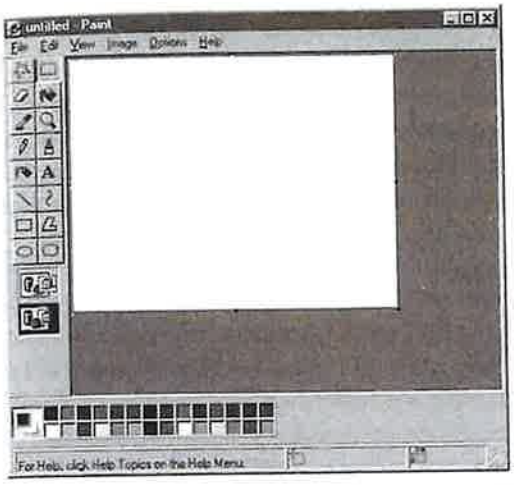


Figure 5-7. *You can open any BMP image with Microsoft Paint, which comes with Windows 95 and Windows NT. Then you can copy and paste the image directly into NetMeeting's Whiteboard.*

If you've ever tried to open a graphic image directly into NetMeeting's Whiteboard, you'll find that it can't open graphics directly and that the only way to get graphics, images, or scans into NetMeeting is to copy them from another program and paste them into the Whiteboard.

For instance, if you want to put clip art on the Whiteboard, you might try opening Microsoft Word, inserting a clip art graphic into a Word document, and then copying and pasting that graphic into NetMeeting's Whiteboard.

> **CAUTION**
>
> It is possible that NetMeeting's audio will break up while opening other applications and copying and pasting shared images in a conference. This is normal because the processor in your machine has to do a lot of work. One way to avoid this problem is to prepare your Whiteboard presentation before you make a NetMeeting call. If you can't do that, open all the applications that you will need before making a NetMeeting call.

Capturing Application Screens

Often you'll want use the Whiteboard to show people an application. There are many different reasons to do that. You might be a Java or Visual Basic programmer who needs to show a prototype screen to a client. You might be a graphic designer

SAMSUNG EXHIBIT 1017, Page 109

who wants to show off a potential Web page design. You might even be an architect who wants to show off a digital model that's been imaged onto your screen.

It's easy to take a screen capture of any window or section of the screen and paste it onto the Whiteboard. (A window is anything with the minimize, maximize, and close buttons in the upper-right corner.) There are three ways to do this. (There is a fourth way, but it requires the use of a separate screen capture utility.)

First, you can take a picture of the entire screen by pressing the Print Scrn key on your keyboard, and then pressing Ctrl + V to paste that image into NetMeeting's Whiteboard (of course, Whiteboard must be open and accessible). Holding down the Alt key while pressing the PrintScrn button will take a screen capture of only the topmost window (the active window).

Second, you can take a picture of any window on your computer. Taking a picture of an entire window will often include the toolbars, menus, and other elements that are inside the window. To take a picture of a window, use the Select Window tool in NetMeeting. When you choose this tool, the NetMeeting application will minimize, and the next window you click will automatically be pasted into NetMeeting's Whiteboard. It takes some practice to master this tool, and I recommend that you don't try to use this tool "live" in a meeting with important executives. If possible, take your screen captures ahead of time. If you can't do this, then practice ahead of time so that you can efficiently take screen captures during an important meeting.

Of course, if you make a mistake, you can simply delete that screen capture and try again. Figure 5-8 shows the dialog window that is displayed when you choose the Select Window option.

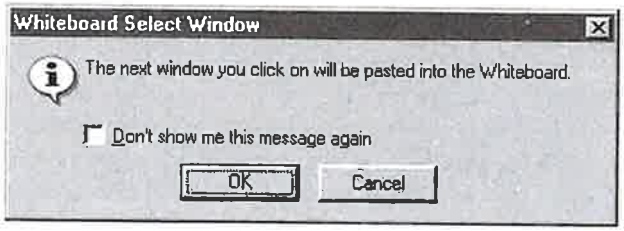


Figure 5-8. *The Select Window dialog lets you know that the next window you click will be copied to the Whiteboard.*

The third way of capturing a screen image is to use the Select Area tool. In many ways, this is more useful than the Select Window tool because you can take a picture of a specific area of the screen and paste that into NetMeeting's Whiteboard. Unfortunately, there's no way to hold down a menu during a screen capture, but some third-party tools will let you capture menus. Visit http://www.shareware.com or http://www.download.com to find a screen-capture utility, if you need more features than NetMeeting gives you.

SAMSUNG EXHIBIT 1017, Page 110

After you've spent a lot of time designing a presentation on the Whiteboard, you might not want other users to be able to move things around or edit them. Remember, however, that in default mode, NetMeeting enables every participant to move objects, delete objects, switch pages, edit text, change colors, and much more. To prevent your partners from doing this—for example, it's easy to accidentally delete information, especially if users have switched to the Eraser tool—click the Lock Contents tool. This enables you to edit what you put on the Whiteboard, but it prevents anyone else from changing or adding to it.

You can toggle the Lock Contents tool, which means that you can turn it on and off easily. If you want to let other people interact with your Whiteboard during a specific part of a presentation, you can unlock it.

During real-world presentations, you've probably seen many speakers use laser pointers to highlight specific items on the screen. NetMeeting has a similar tool called the Remote Pointer, which enables you to focus everyone's attention on a specific part of the screen. Just click the Remote Pointer when you want to begin and click it off to remove it.

Every participant has their own distinctive pointer, so your audience can point at the screen, too, while asking questions. Use the pointer sparingly, however, or else it loses its impact.

FROM HERE...

You now know how to use NetMeeting's basic Chat and Whiteboard features, and I hope this chapter has given you an appreciation of the roles those tools can play in your NetMeeting communication. In the following chapters, you will learn how to expand your NetMeeting skills and how to best take advantage of NetMeeting's audio and video features. In addition, you'll learn more about how NetMeeting can improve communications with your business partners and clients.

You can read about these topics in the following chapters:

- Chapter 6, "Working with Audio," shows you how to use NetMeeting's audio capabilities to augment the Chat and Whiteboard features we've just explored.
- Chapter 7, "Video Conferencing," gets you started with this powerful feature so that you will be able to see your partners.
- Chapter 12, "NetMeeting as Part of Your Network," helps you expand NetMeeting into a full business tool by making it part of your suite of business communications tools.

SAMSUNG EXHIBIT 1017, Page 111

Chapter 6

Working with Audio

In this chapter, you will learn:

- **How computer telephony works**. You can use your computer as a telephone; this chapter shows you how to do that.
- **The importance of full-duplex.** Full- and half-duplex are important factors when using the NetMeeting audio features. They're not as complicated as you might think.
- **Meeting the industry standards.** What if someone wants to talk with you on a network but they're not using NetMeeting? NetMeeting conforms to standards that allow it to work with other conferencing applications.
- **Compression and decompression**. NetMeeting depends on compression technologies to perform audio exchanges. I will cover some of the basics of audio compression technology.

Making your NetMeeting session a multimedia experience starts with the program's audio features. These features allow you to carry on a live conversation with any person connected to you using NetMeeting.

SAMSUNG EXHIBIT 1017, Page 113

The features discussed in the previous chapter, "Chat and the Whiteboard," use data conferencing. Data conferencing is the exchange of computer data between machines; audio conferencing is the exchange of human conversation between two computers. The two conferencing types are significantly different. As you'll see in this chapter, audio conferencing is more complex than data conferencing, but it can also be more rewarding. Using data and audio conferencing together makes your virtual meeting on the Internet or corporate intranet seem more like a face-to-face meeting.

AUDIO AND YOUR PC

Multimedia and the PC have come a long way in the past 10 years. Some of you may remember the Adlib card that added simple sound to the PC in the mid-1980s. Now we have 32-bit wavetable boards, digital video discs (DVD), and 3D sound capability. Some computer sound systems are more powerful than the average home stereo, so people often integrate their home stereo with their PC to provide the ultimate multimedia experience.

Unlike the Macintosh, early PCs didn't come with sound capabilities (they had an internal speaker that could beep—not exactly a multimedia experience). You couldn't play digital sound through this little speaker without special software, and even then the quality wasn't great.

Since the advent and popularity of the Creative Labs SoundBlaster and software, you'll have a hard time finding a PC without a sound card and speakers. Some of the newer PCs even come with answering machine and voice mail capabilities. Creative Labs set the standard for the rest of the sound card manufacturers to follow.

What does this have to do with NetMeeting? Everything. To use the audio features of NetMeeting, you need a sound card that is compatible with the Microsoft operating system, speakers, and a microphone. (A microphone is only required if you want to send audio.) The Creative Labs SoundBlaster and compatibles are made to work with Windows. If you bought your computer in the last five years, chances are your sound card works with NetMeeting.

You can use NetMeeting audio on the Internet to have a voice conversation with anyone in the world, provided that person has NetMeeting (or a H.323 standards-compliant audio phone). This means you can make a long-distance phone call for free by using the Internet as your phone network.

As I mentioned in Chapter 4, "Making Your First Call," this is not a scam and the phone company is not going to come after you. The only charge to you is for your Internet provider or commercial online service. This is usually a monthly charge with unlimited access, so you can use NetMeeting as often as

SAMSUNG EXHIBIT 1017, Page 114

you want and your monthly bill will not vary much. (Note that you're also charged for phone calls to your service provider, but for most users these are free local calls.)

The government and the communications industry are talking about metering Internet service. This means, in the future, you could be charged a monthly fee based on the amount of data you transmit over the public network.

This won't happen anytime soon, but you can bet that it will happen. The downside is that you'll pay more to use the Internet. But the upside is that, most likely, the quality of the Internet will improve, and you'll have fewer waits and higher bandwidth capabilities.

You can also save time and money by using NetMeeeting audio on a corporate wide area network (WAN), especially if you often make long-distance calls from your office. Most large corporations have dedicated WAN connections between offices that can now be used for both data and voice calls. In fact, a dedicated voice network can be joined with the data network by using a telephony gateway. A telephony gateway bridges a phone network to a data network by translating the voice from a phone network into small network packets that can be transmitted on the data network. The gateway also performs the inverse by translating network packets back to sound that you can understand. In this manner, you can carry on a conversation by using your data network as the communication pathway instead of using a traditional phone network.

More important, on a local area network (LAN), the audio makes it easier to collaborate during a NetMeeting session. Think about your favorite computer game without sound or your car without a stereo. In both cases, the device is still functional but the sound adds a dynamic dimension (I don't know what I'd do without my car stereo!).

Your experience with NetMeeting will no doubt be the same. Audio adds a lot to a network-based conference. The first time you use audio with NetMeeting may be somewhat awkward because you are probably not accustomed to talking into your computer. But that will change with time. As with anything, the more that you use it, the easier it gets.

How Computer Telephony Works

As you might imagine, turning your computer into a phone that can make free long-distance calls is not an easy task (though it's easy compared to the video feature—more on that in Chapter 7, "Video Conferencing"). Many components in your computer and on the LAN or Internet have to work flawlessly for an effective audio conference.

SAMSUNG EXHIBIT 1017, Page 115

It's important to understand how an audio conference works so you can fix any problems that may arise. Although not every aspect of this process is within your control, at least you'll have some understanding of why you're having problems—plus, you'll get a short lesson in physics and communications.

Unfortunately, as with anything complex, many things can go wrong. The more steps and processes involved, the greater the likelihood of failure.

Sending audio with NetMeeting involves six steps. Each step depends on the previous step for the audio to work. These steps are capture, compression, transmission, reception, decompression, and playback. Figure 6-1 diagrams the relationship between two computers in an audio conference.

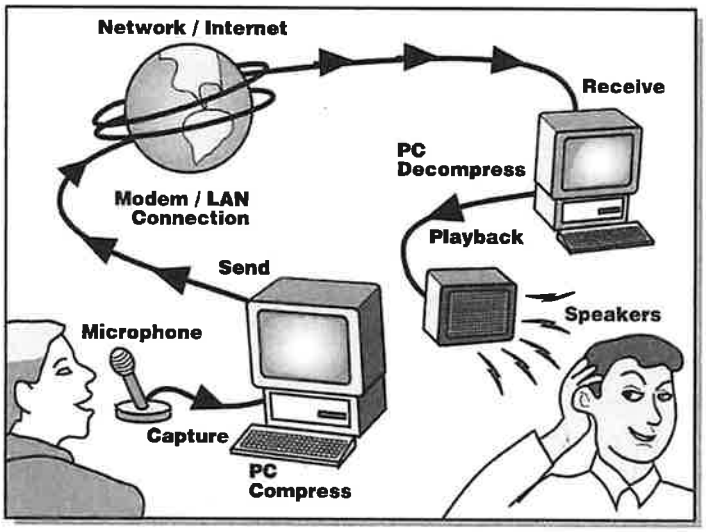


Figure 6-1. *Sending audio from one computer to another on a network.*

The audio begins in your microphone, continues into your computer, goes across a network into another computer, and finally comes out of the speakers. All this has to happen in under 150 milliseconds (ms) or .15 sec for you to have a good conversation.

Audio Capture

When you speak, your vocal cords produce vibrations that are transmitted through the air as sound waves. Compression of the air creates these waves. You manipulate the frequency, tone, and pitch when you talk with someone.

When you speak into a microphone, a small diaphragm with an electric coil on one side converts the sound waves into an analog electrical signal. This signal on a wire is an representation of the sound waves in the form of electrical energy.

SAMSUNG EXHIBIT 1017, Page 116

The electric signal feeds into your sound card and is digitized by a chip. This is called *analog-to-digital (A-to-D)* conversion (shown in Figure 6-2). Your CD player does the inverse of this function by converting a digital signal on the CD to an analog signal for your speakers.

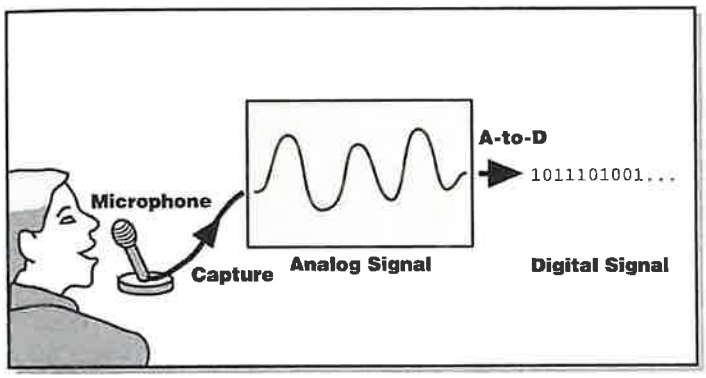


Figure 6-2. *Your voice is converted to digital ones and zeros.*

Computers use pulse-coded modulation (PCM) to digitize an audio signal. Every fraction of a second, the computer takes a reading from the incoming analog signal and converts it into a number. Each conversion is called a *sample*. The interval at which the audio is read and converted is completely dependent on the sampling frequency.

Most sound cards capture from 8 kHz to 44 kHz. This means that if you're recording at 8 kHz, an audio sample is read and converted every 1/8000 of a second, yielding 8000 samples per second. Standard sound card sample frequencies are 8, 11, 22, and 44 kHz.

How does this relate to data size? Is an 8-kHz signal equal to 8000 bytes? The answer is: sometimes. Each sample can be either an 8-bit or a 16-bit quantity. An 8-bit sample can have a value ranging from -127 to 128. A 16-bit sample can range from -32,767 to 32,768.

The 16-bit sample takes 2 bytes per reading and, because of its higher precision, reproduces a much more realistic sound than an 8-bit sample. As you would expect, a 16-bit sample is twice as large.

NOTE

Your CD player also uses PCM and records audio at 44 kHz in stereo for a total of 88,000 samples per sec.

SAMSUNG EXHIBIT 1017, Page 117

One other possibility for an 8-kHz sample: the signal could be encoded in stereo. This doubles the size once again but also improves the capability of the signal being digitized.

At the low end, we have 8-kHz, mono, 8-bit (8000 bytes/sec; 64,000 bits/sec) signals. At the high end, we have 44-kHz, stereo, 16-bit (176,000 bytes/sec; 1,408,000 bits/sec) signals. Now you see why multimedia is such a challenge to engineers and to computers. So much more data has to be processed compared with other data types—and it has to be processed quickly.

Every second, your computer must process the same volume of audio or breakups in the signal can result. When it can't handle the information, your computer may sound as though it has a short circuit. The audio starts and then pauses, which makes it worthless. Remember, this is just the first step of the process.

Compression

A huge amount of data is produced by your sound card when you're talking. In the previous examples, the lowest-quality signal produced 64,000 bits/sec. If you're using a modem that can transmit 14,400 bits per second (a 14.4 modem) or a modem that can transmit 28,800 bits per second (a 28.8 modem), you can't possibly send the raw audio signal. That would be like passing a baseball through a straw: it just can't be done.

If you were to use the high-quality signal, which needs 1,408,000 bits per second, it would be like passing a horse through the head of a needle. So you have to cut down the amount of data without sacrificing quality. It would be worthless to go through all of this only to get unintelligible sound on the other side.

You can eliminate the need for stereo transmission because you can only speak in mono. If you know someone who can speak in stereo, you might want to contact Ripley.

Sample frequencies of 8 kHz and 11 kHz are high enough to reproduce the human voice without losing too much quality. NetMeeting uses the 8-kHz sample frequency if the sound card can support it. The Microsoft standard for sound cards requires the sound card to go down to the 11-kHz sample frequency range, so some sound cards don't accommodate the 8-kHz sample frequency. In this case, the signal will be downsampled from 11 kHz to 8 kHz by software.

This leaves the choice of 8-bit or 16-bit samples. In most cases, an 8-bit sample is enough but a 16-bit sample sounds better. Some compression algorithms take either type and output the same data size. Even with an 8-kHz, 8-bit, mono signal, the signal size is still 64,000 bits/sec and only 14,400 or 28,800 bits per second of bandwidth are available if you're using a modem.

The solution is a mathematical algorithm that compresses the information. Later in this chapter, you'll learn about the algorithms used by NetMeeting and how an audio codec works.

SAMSUNG EXHIBIT 1017, Page 118

You know from Chapter 2, "Preparing Your System," that a codec is a compressor/decompressor. This codec takes your baseball (uncompressed audio) and shrinks it down to the size of a BB (compressed audio) that can easily be sent through a straw (modem connection). So a 64,000-bits/sec signal can be reduced to 5,500 bits/sec—over 10:1 compression.

But this compression comes with a price. Quality is usually sacrificed, and your CPU has to supply a great deal of horsepower for real-time compression.

Transmission and Reception

The audio has been sampled and compressed, so now it's sent along its merry way through the network. If you remember from Chapter 2, the TCP/IP network is a packet-switched network. Little pieces of information are stored in packets that are sent on the network with a source and destination address. The source address is your computer's IP address and the destination address is the address of the computer that's going to receive the packet.

An audio packet for a standards-based Internet phone typically represents 50 ms or 400 samples of the source audio. So 20 packets of audio are sent every second from your computer to the remote system. Every 50 ms, 400 samples must be captured, compressed, and transmitted for the audio to work properly.

> **NOTE**
>
> QoS: Quality of service measures the total quality of the audio signal.

An important aspect of the transmission/reception of a voice call over an IP network is the time it takes for that 50 ms (400 samples) of compressed audio data to get to the remote side. Most people in the telecommunications industry agree that if it takes more than 150 ms for the data to get from the source to the destination, the quality is poor.

If you've ever placed an international phone call, you may have experienced long delays in transmission. This is called *latency*. The higher the latency, the lower the quality.

Many factors on an IP network can affect the latency: congestion, propagation, and number of network hops. If you're placing a call during the network's peak usage times or across a long geographic distance that needs many routers, the latency may go up and the signal quality will go down.

Propagation means the time it takes for a signal to get from the input to the output of a hardware circuit. This is typically out of your control. As router technology gets better, propagation values decrease. If you're using the Internet, congestion and the number of hops needed for your call are also out of your control.

SAMSUNG EXHIBIT 1017, Page 119

Why is latency so important to the quality of the signal? In a conversation, two parties interact with constant bidirectional communication. When the sound spoken by one party and heard by the other is delayed by more than 150 ms, conversation becomes difficult.

If you ask a question and it takes one second for your speech to be heard, and then another second for you to hear the response, the conversation is no longer interactive.

Latency and packet loss are two of the biggest problems with a packet-based phone call. Packet loss occurs when some part of the network between you and the recipient decides that your audio packet must be dropped—typically when there's a lot of congestion on the network. This is how the network handles information overflow: packets are simply lost.

This happens all the time when you're browsing the Internet. Symptoms of packet loss are slow data transfer and lack of responsiveness. You might wonder how the Internet could possibly be used for anything if it can just drop packets. Without getting into Internet protocols, let's just say that, in most cases, the dropped packets are sent again until they go through.

These are some of the basic aspects of transmission and reception of audio signals. When you pick up your home phone, you're using the public switched telephone network (PSTN) line that your local phone company provides for you. When you dial a phone number, a series of switches connect you to the person you're calling (this is what *switched* means).

The major phone companies are making efforts to convert the PSTN network to a packet-switched network. In a couple of years, you'll be placing a voice-over-IP call without even knowing it. Today, several long-distance companies, called *NextGen Telcos,* offer international phone service at a significantly reduced rate. These companies use the Internet to transport your phone call and pass that savings on to you.

Decompression

Your packet has been through a lot so far and it still has two more stages to go before the journey is done. Assuming that the packet made it without getting dropped, now it has to be decompressed.

Decompression is the inverse of compression. The quality of the decompressed signal is lower than the source audio signal, but it's good enough for you to understand.

When you use a cellular phone, Groupe Spéciale Mobile (GSM) compression is applied because the cellular network is a packet-switched network. (GSM is a European digital cellular phone system.) You may notice a crackle or hiss in a cellular call. Provided that there's no interference, this crackle or hiss is caused by the compression algorithm in your cellular phone.

SAMSUNG EXHIBIT 1017, Page 120

The result of the decompression is a set of samples that should be pretty close to the original sound recorded at the source. The differences between the source and the output of the decompressor cause the degradation of the signal. Every 50 ms the decompression algorithm should produce 400 samples of data to be played back by the sound card. If it doesn't, there's a breakup in the audio.

Playback

At last the audio packet is ready to be played back by the sound card. Playback is the inverse of capture, just as decompression is the inverse of compression. The speaker and the microphone are very similar devices. Both use the same technology, involving a diaphragm and an electric coil. In fact, you can use them interchangeably in your system. However, the size of the diaphragm in each device has been optimized for that device's application.

The digital signal is first converted to an analog signal by the sound card (D-to-A conversion). Each digital sample is used to reconstruct an electronic wave carried by the speaker wire. The electronic wave produced by the sound card travels to the coil in the speaker and makes the diaphragm vibrate (shown in Figure 6-3). This vibration creates sound waves that you can hear.

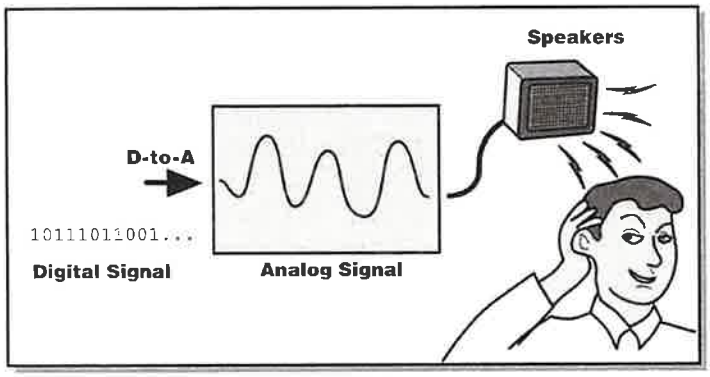


Figure 6-3. *Playback of the digital signal through your speakers.*

FULL-DUPLEX AND HALF-DUPLEX

The term *duplex* in communications sometimes baffles users but it's really simple to understand. Duplex means that a signal can be sent in both directions at the same time on the same connection. Half-duplex sends a one-way signal and full-duplex sends a two-way signal.

A one-lane bridge is a good example of half-duplex capability. Cars can go across the bridge in one direction or the other, but not in both directions at

SAMSUNG EXHIBIT 1017, Page 121

the same time. When you add another lane to the bridge, it has full-duplex capability because cars can move in both directions at the same time. How does this relate to communications?

Your phone provides a full-duplex circuit. Both you and the other person can talk at the same time. This may not be effective conversation but it's possible.

Your conversations are typically one way (half-duplex), but sometimes you have to interrupt the other person. Modems are full-duplex devices that can send and receive data at the same time. This means you can send email and download a file at the same time. Full-duplex is a desired capability in any communication because it increases the amount of interactivity possible.

The sound card in your computer may not be full-duplex. It may be that you do not have the proper drivers or it may be that the hardware does not support this type of operation. Most sound cards aren't full duplex,because how many people need to record and play audio simultaneously? Games are the most popular use for a sound card, and I don't know of any games that let you record audio. Before computer telephony, there was no other application that needed full-duplex capability.

If your sound card has full-duplex capability, NetMeeting will automatically detect this ability and enable this option. If it doesn't, you can select the Enable Full Duplex audio option on the NetMeeting Properties, Audio tab.

If you think you won't be able to use the audio features of NetMeeting with only a half-duplex sound card, don't worry—you have a couple of options. However, your conversations won't be as interactive as with a full-duplex sound card.

If you have a Creative Labs SoundBlaster and the NetMeeting check box says you have only half-duplex capability, you can get new drivers from Creative Labs at http://www.creaf.com/. With these new drivers, you can use your existing SoundBlaster card in full-duplex mode. (If you're using a sound card from another manufacturer, check their Web site for updated drivers.)

If there are no full duplex drivers available for your sound card, you can either replace it with a new one or add another sound card to your system. Before you choose the second option, note that configuring two sound cards in the same machine is not a task for the fainthearted. Most sound cards sold today do support full-duplex operation and sound cards are not too expensive.

You can only have a full-duplex conversation using NetMeeting if both people have full-duplex sound cards. Therefore, it doesn't matter if you replace yours if the person on the other end has only a half-duplex sound card.

Think about putting a one-lane bridge together with a two-lane bridge: cars can only go in one direction at a time. It's the same with audio: if one person in the conversation has half-duplex and the other has full-duplex, the signal can only go in one direction at a time. NetMeeting has also added DirectSound support, which can increase the quality of a call, too. Not all sound cards support DirectSound, so consider this feature when purchasing a sound card.

SAMSUNG EXHIBIT 1017, Page 122

Avoiding CB-Radio Syndrome

A CB radio is an example of a half-duplex device. Only one person can speak at one time and you can't listen while you speak. When you use NetMeeting to talk with another person, you may have a tendency to talk as if you're using a CB.

There are a couple of reasons for this. If you or the other person has a half-duplex sound card, the only way to carry on a conversation is CB-style, which is like a Ping-Pong game. This kind of conversation has some value, but the quality won't match that of your phone.

Latency can also play a part in creating a CB-like conversation. Even if both people have a full-duplex sound card, the same thing can happen if it takes too long for the audio packets to be exchanged between the two sides. (See the discussion of latency in "Transmission and Reception" earlier in this chapter.)

If both computers have a full-duplex sound card and the latency is low, your conversation should be like a conversation using a speakerphone.

Using a Headset

The best way to take advantage of NetMeeting's audio capabilities is to use a headset. A headset combines the speakers and microphone into one easy-to-use device that you wear on your head. A headset has two plugs, one that goes into your speaker jack and one that goes into the microphone jack. Using a headset has many advantages, and your overall experience of NetMeeting's audio features will be improved when using a headset.

For example, an open-air microphone is sometimes too sensitive and picks up any background noise. This noise can make your voice unclear on the other side and also cause the compressor to work harder than it should. In most cases when you're audio conferencing with NetMeeting, you're the only one talking and you're listening to only one person.

A headset minimizes background noise by picking up only the sounds closest to the microphone. In a conversation, this sound is your voice. The integrated headphones also make it easier to hear the other person.

In addition, one of the biggest advantages of using a headset is that it helps eliminate echo and reverberation. Echo and reverberation occur when the microphone records the output of the speakers and sends it back to the other user. This creates a loop that results in echo and a screeching noise.

You've probably heard reverberation (also called *feedback*) at a gathering where amplified sound equipment is being used. The reverberation may have sounded like running your fingernails across a chalkboard.

Most computer stores carry headsets in the section with speakers and microphones. If you don't have a microphone for your computer, which is the case for most computer users, buy a headset instead of a microphone. It's definitely a good investment.

SAMSUNG EXHIBIT 1017, Page 123

UNDERSTANDING AUDIO STANDARDS

Standards are all around us: they describe how things are built and how things interact. Without standards, the world would be full of proprietary solutions that make life difficult and cause higher prices.

Standards help different companies build compatible devices, and provide guidelines for acceptable quality and function. Audio conferencing over the Internet began in 1995, so the standards have just begun to evolve. However, there is one standard, H.323, that has a great deal of industry support.

Audio conferencing standards are confusing. There are many standards and their names are hard to remember. In addition, these standards are continually changing as technology improves and users provide developers with more input.

It takes time and cooperation between the manufacturers to adopt a standard. And a standard is only standard when everyone uses it. Since audio conferencing standards are so new, they're not widely used. There are over 30 Internet phones out there and only a handful of them can talk to each other. This is rapidly changing as H.323 becomes adopted. An audio conferencing standard has to cover three components of an IP phone conversation: call management, data transfer protocol, and audio compression. Such a standard gives the vendor specifications for developing each of these components.

The standard specification is independent of user interface and operating system. This means that a standards-based application can run on whatever computer operating system the developers choose and that it can talk with a standards-based application on another operating system. Thus a standards-based application on a Macintosh system can to talk to a similar application on a Windows system.

Computer telephony over packet-switched networks is a hot new project in the International Telecommunications Union (ITU), a standards body consisting of members from every large communications company in the world. The ITU creates standards for communications equipment and networks.

It's in the best interest of people around the world and of the communications companies for their equipment to be compatible. So the ITU created the T.120 (pronounced *tee-dot-120*) standard to cover every aspect of data conferencing between computers on a network. The same organization also created H.323 for audio and video conferencing.

Complying with the H.323 Standard

NetMeeting is fully compliant with H.323, which was ratified by the ITU in June 1996 and covers audio and video communications on an IP network. Any software application or hardware device that complies with this standard can communicate with any other standards-based application, such as another Internet phone or gateway.

SAMSUNG EXHIBIT 1017, Page 124

An example is an Internet phone working on an operating system other than Microsoft Windows, like a UNIX or MacOS system. In the future, there may even be an IP-based phone that doesn't use your computer but is a stand-alone device. Think of this as an Internet or network appliance.

H.323 is a specification for both audio and video. Within the H.323 specification, the type of audio compressor/decompressor (codec) is defined. (Remember, an audio codec is a mathematical alogorithm for compression and decompression.) The recommended audio codec selected by the standards committee for H.323 is G.723.1. This codec has been jointly developed by eight companies and its development began in 1983. I will talk more about the details of G.723.1 later.

NetMeeting uses the G.723.1 audio codec as the default codec to compress and decompress your speech, which makes it compliant to the audio portion of the standard. As you will learn later in this chapter, you can change the codec that NetMeeting uses.

NetMeeting and Nonstandard Internet Phones

The number of products on the market providing Internet telephony seems to increase weekly and it is unlikely that this number will decrease any time soon. And only a handful of these products are compatible with one another because they follow the H.323 standard. For point-to-point communication, you need two copies of the same application. So you can see the importance of standards.

NetMeeting does not communicate with any nonstandard Internet phone. So if you want to talk with someone on the Internet, that person needs NetMeeting or an H.323-compliant application. Any Internet telephony product that lasts in the marketplace is expected to become compliant with H.323.

How Your Machine Compresses Audio

Compression is the most important part of network telephony. Without compression, the audio data would be too large to transmit over regular phone lines and many people would be unable to use the technology. Compression is also an integral part of the cellular phone network.

As you learned earlier, a digital audio stream is a sequence of numbers that represents a sound wave. The amount of numbers in this sequence depends on the sample frequency, the number of channels, and the precision with which the sequence is recorded.

For computer telephony, 8000 samples/sec produce good voice reproduction. The job of the compressor is to shrink the 64,000 bits per second (8000 bytes * 8 bits/byte) to a much smaller number without losing too much quality.

SAMSUNG EXHIBIT 1017, Page 125

NOTE

The asterisk "*" is a commonly used symbol for multiplication.

The G.723.1 subspecification in the H.323 standard dictates the use of either a 5300 bits/sec or a 6300 bits/sec audio codec. This means that the output of the compressor is always one of these two numbers, depending on which bit rate is chosen. (The standard includes two different audio codecs.)

The three types of audio codecs used today are, in order of increasing complexity: differential, linear predictive, and harmonic. Each uses a completely different method of compression. More audio codecs are sure to be developed in the future.

Details about each of these codecs are beyond the scope of this book but here is a brief overview.

Encoding and decoding are the basis of any codec. Encoding is the process of representing one thing with another. Decoding is the inverse of encoding. You may remember encoding and/or decoding secret messages as a child.

In the world of compression, the idea is to represent a long item with something shorter. So the encoded data is a representation of the original, but in a smaller form. The three audio codecs use encoding in different ways.

A differential codec encodes the difference between adjacent samples in an audio stream. The most common differential codec is adaptive differential pulse-coded modulation (ADPCM). This codec has a 2:1 compression ratio so the 64,000 bits/sec signal is reduced to 32,000 bits/sec. It has a low complexity and good-quality output. This is good compression but not good enough for your application.

A linear predictive codec compares sections of the audio stream with a set of predefined functions. These functions have been predetermined by the audio codec designers to be similar to audio waveforms. An example might be $f(x)=2x$. Here the output of the function always equals two times the input variable x. A comparison is made between the source audio values and those from the output of the predefined functions. The parameters of these functions (in the example, *2* can be a parameter) are modified until the output of the functions is a close match to the audio being compressed. When these values are close together, all the parameters of the predefined functions that allowed for the match are encoded. It is a mathematical matching process. Looking at our example, it may be that $f(x)=20.3x$ is similar to the section of the audio waveform that we are trying to compress. This is a greatly simplified definition of a pretty complex operation, but you should get the basic idea. A linear predictive codec has medium complexity and the output is acceptable for your application. G.723.1 is a linear predictive codec.

SAMSUNG EXHIBIT 1017, Page 126

The harmonic codec takes advantage of the fact that digital sound is a representation of a sinusoidal sound wave. (*Sinusoidal* means like a sine wave.) Harmonic encoding breaks the digital sound wave into sections of sinusoids and encodes the values needed to replicate them. Again, this definition is greatly simplified.

You don't have to know how compression works (as you don't have to know how the engine in your car works). But it's nice to have a clue. Who knows—maybe you'll come up with another way to compress audio and make a breakthrough in the technology.

Leveraging Processor Speed

Quality is an important property of an audio codec. Another equally important property is the complexity of the codec. A more complex codec takes more of your processor's attention than a less complex codec.

Remember that your computer has to capture, compress, and transmit 8000 samples per second. In a full-duplex conversation, it must also receive, decompress, and play back 8000 samples per second at the same time. This can be a lot of work for your computer. The G.723.1 codec has medium complexity and should run without any trouble on a computer with a 100-MHz or higher Pentium processor.

Slower processors can also use these audio codecs. But be aware of how much of your processor you're using. Running other applications at the same time as NetMeeting may not be an option for some computers.

You'll have to experiment with this since every computer is a little different. You can use the Intel Connection Advisor discussed in Chapter 3, "Installation" to check how much of your processor you're using.

> **NOTE**
>
> Multimedia extension (MMX) technology embedded in the processor is designed to lower the processor load for audio and video compression and decompression. All of the compressors used by NetMeeting are designed to take advantage of MMX technology.

Using NetMeeting's Audio Codecs

In addition to the standards-based audio codecs, NetMeeting comes with several audio codecs that you can choose from. These codecs are available to almost any Windows application that uses audio through the Audio Compression Manager (ACM), accessed via the Control Panel.

SAMSUNG EXHIBIT 1017, Page 127

To see a list of installed audio codecs on your computer, click on Start, Settings, Control Panel, Multimedia icon, Advanced tab, and the Audio Compression Codecs icon. Figure 6-4 is an example of a list of installed codecs.

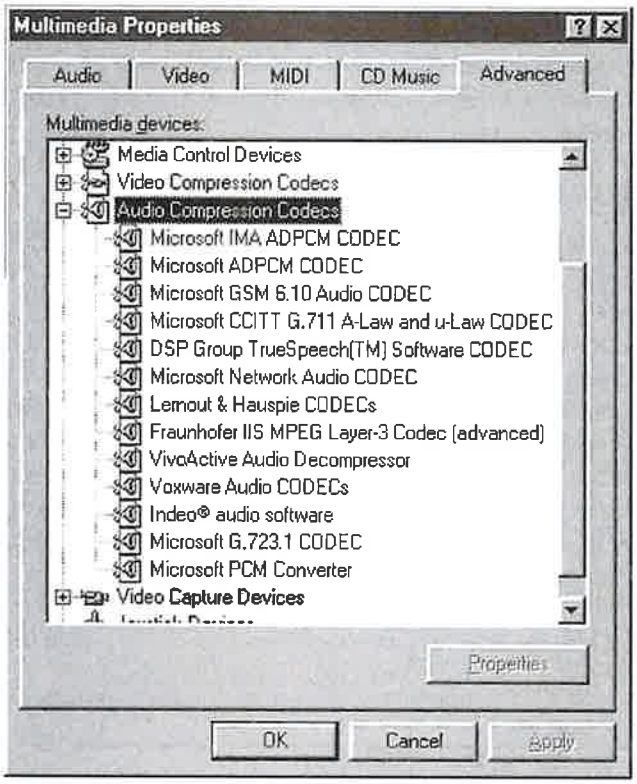


Figure 6-4. *The Advanced tab of the Multimedia Properties dialog box lists the installed codecs.*

A list of the codecs used by NetMeeting is on the Audio tab of the NetMeeting Properties dialog box. Select Tools, Options, Audio tab, then click the Advanced button to see the dialog box shown in Figure 6-5.

WARNING

If you're not an experienced user, do not change any of the settings in the ACM. You might disable valuable NetMeeting components or components of other software on your computer.

SAMSUNG EXHIBIT 1017, Page 128

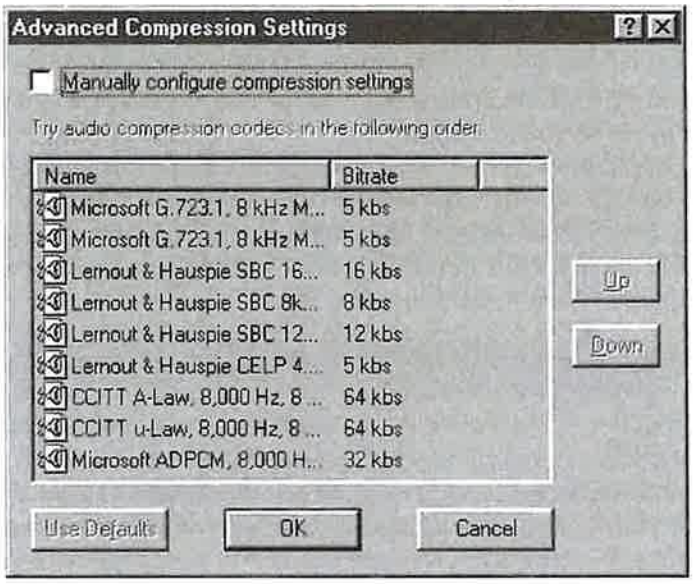


Figure 6-5. *The Advanced Compression Settings dialog box lists the installed NetMeeting codecs and allows you to change their priorities.*

In the Advanced Compression Settings dialog box, you can change the order of the NetMeeting codecs. The default, the 6300 bits/sec standards-based G.723.1 codec, is at the top. To change the order, select "Manually configure compression settings." Now select any of the codecs on the list and move it up or down according to its priority.

Why would you do this? If you don't like the default codec because of its quality or complexity, you can select another one.

In most cases, you should leave these settings the way they are. Keep in mind that each codec has different complexity, output, bit rate (shown on the list), and quality. NetMeeting will automatically match the codec on your side with the one of the person calling you.

If you decide to change the settings, make sure you don't exceed the bandwidth available to you. The ADPCM codec does not work with a 14.4 modem because it requires 64 kilobits of bandwidth and a 14.4 modem only has 14.4 kilobits of bandwidth. But if you're on a LAN and want to get better audio quality than the default codec, you may want to use ADPCM because it will provide crystal clear audio.

On the other hand, just because you're on a LAN doesn't mean that you should take as much of its resources as you can. Experiment with these settings and see what you like. You'll find a codec that meets your needs.

SAMSUNG EXHIBIT 1017, Page 129

Adjusting the Audio Level and Microphone Sensitivity

Audio levels are pretty simple. If you turn the level up, the sound is louder; if you turn the level down, the sound is softer. What's not as clear is how to change these levels on your computer.

The NetMeeting Audio toolbar shown in Figure 6-6 gives you an easy way to do this. To adjust the microphone or speaker volume, drag the appropriate slider on the toolbar. Moving the slider to the right increases the volume level. Clearing the check box next to the microphone mutes your voice and clearing the check box next to the speakers mutes the speakers.



Figure 6-6. *Use the Audio toolbar to adjust the microphone and speaker volume.*

The NetMeeting Audio Tuning Wizard calculates the levels of your microphone during setup by analyzing the volume of your voice through your microphone. This wizard does a pretty good job of setting the levels and includes a visual representation of your voice when you are setting the recording levels. Figure 6-7 shows the recording dialog box of the Audio Tuning Wizard.

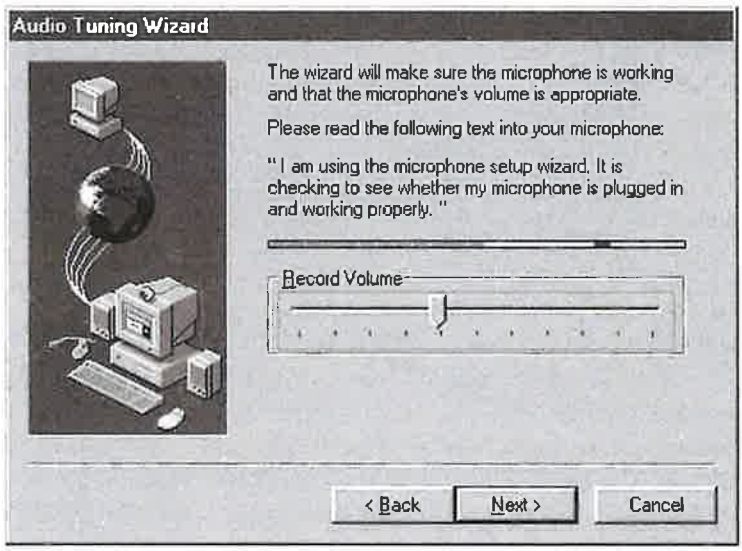


Figure 6-7. *Setting the recording volume with the Audio Tuning Wizard.*

You can also allow NetMeeting to perform Auto-gain, which gives the microphone dynamic level. Then if you speak softly, the volume is turned up and if you speak loudly, the volume is turned down.

SAMSUNG EXHIBIT 1017, Page 130

Or you can configure this option in the NetMeeting Properties window on the Audio tab. Some configurations don't allow Auto-gain, so don't be disappointed if it's not enabled on your computer. Most of the Creative Labs SoundBlaster cards, such as the SoundBlaster AWE64, support Auto-gain.

Microphone sensitivity is the last NetMeeting audio feature you need to know about. NetMeeting sends audio to the remote site only if it detects that you're speaking into the microphone. This is done with a silence-detection algorithm that responds to the microphone sensitivity selected in the Audio Settings dialog box. By not compressing and transmitting unless you're talking, NetMeeting saves bandwidth and valuable processor time.

However, if the microphone sensitivity is not set properly, it can cut off your speech. You can set NetMeeting to automatically adjust the sensitivity or you can set the sensitivity manually.

The higher you set the sensitivity, the more likely you are to send background noise or empty audio. At the lowest sensitivity, in some situations the software may not even recognize that you're speaking. Like the codec selection discussed earlier, this is a setting you can experiment with.

Be aware that the distance between your mouth and the microphone can effect how well the audio works. If you are too close, you can overdrive the microphone and cause the audio to sound poor or break up. If you are too far away, your voice may be too soft to be heard by the other user or detected by NetMeeting. The Audio Tuning Wizard is a good way to gauge this.

FROM HERE...

This chapter has shown how the audio features of NetMeeting work. Some of these details were pretty complex—they were not meant to scare you, but to help you understand what happens during a NetMeeting audio conference. Audio is a dynamic portion of NetMeeting that makes it a true multimedia application. Combined with the video features of NetMeeting, your computer will become a new way to communicate with your friends, colleagues, and family.

Refer to the following chapters for more information:

- Chapter 3, "Installation," provides specific information about setting up the audio features of NetMeeting.
- Chapter 7, "Video Conferencing," shows you how to add video capabilties to the audio.
- Chapter 15, "Troubleshooting Audio," provides assistance if you're having trouble with the audio features.

SAMSUNG EXHIBIT 1017, Page 131

Chapter 7

Video Conferencing

In this chapter, you will learn:

- **How video conferencing works**. This is an overview of the basics and components of video conferencing technology. Video conferencing allows you to see the person that you are connected to.
- **Capturing video**. Most computers don't come with the capability to capture video, so you have to add some hardware to your system to do this.
- **Configuring the software**. Once your hardware is ready, you'll need to make some adjustments to NetMeeting's configuration.
- **Tips for good conferencing**. There are many ways to make a video conference a better experience. Some of these tips may surprise you!

As you've seen so far, NetMeeting has many features that you can use to communicate with anyone on a network or on the Internet. One of the most impressive of these features is video conferencing.

Video conferencing is the exchange of video between two sites. Until recently, this capability required the purchase of expensive equipment, relegating its use to Fortune 500 companies. With NetMeeting, you can add video conferencing capability to your PC for a few hundred dollars. In this chapter, you learn all about

SAMSUNG EXHIBIT 1017, Page 133

the video conferencing capability built into NetMeeting, including how it works and how to set it up.

UNDERSTANDING INTERNET VIDEO CONFERENCING

Video is one of the most powerful communication mediums ever invented. If a picture is worth a thousand words and video offers many pictures each second, it must be worth a great deal.

No other technology can capture any moment, any scene, any event and communicate that moment, scene, or event again and again without losing value. Humans are visual beings: we love to see the world around us. Ask yourself, would you rather listen to a sporting event or watch it?

Video conferencing adds this dynamic medium to your personal computer for use in two-way conversations. When you use this NetMeeting feature on the Internet, you can see someone else anywhere in the world in near real-time.

A technology like this has been in the minds of inventors, artists, engineers, and businesspeople for a long time. For TV shows like *Star Trek* and *Knight Rider* (early David Hasslehoff with talking car), video conferencing is a technology that takes center stage.

Video conferencing involves many technologies that must come together at the same time to work effectively. The first working videophone was shown at the 1964 World's Fair by AT&T. The cost to use this device was reported at $1,000 per minute.

As you might imagine, the cost of this technology was prohibitive. But for the first time, the idea of a videophone was shown in a tangible medium. It would take years of research and development in compression, digital processors, and communications before video conferencing became a reality.

Over the past 10 years, video conferencing technology has been adopted by big business as a way to cut down on travel costs between corporate offices. And this is only one of the its many uses (more on that later).

Traditional or Desktop Video Conferencing

A typical video conferencing setup includes a room built specifically for this purpose, including special wall insulation and lighting. Leased ISDN and T1 communications lines are wired into the room to plug into the video conferencing system. These lines can cost thousands of dollars per month to operate, plus any toll and usage fees.

SAMSUNG EXHIBIT 1017, Page 134

> **NOTE**
>
> Integrated Services Digital Network (ISDN) lines can carry information at speeds of up to 64 Kbps. T1 lines can provide speeds of up to 1.5 Mbps.

In addition, an entire industry is dedicated to every aspect of video conferencing systems. Vendors such as PictureTel and VTEL manufacture and sell these systems at a total cost of from $5,000 to $100,000 for one site. And don't forget that you need at least two video conferencing systems, one at each site. Add in the monthly cost to operate, maintain, and manage the system and you can see why video conferencing is not yet a household word.

Desktop video conferencing (DVC), however, does offer affordable video conferencing because it uses a PC to do all the work. Whereas video conferencing systems need a specialized environment, your PC is an all-purpose device. You can use it for spreadsheets, word processing, and games, in addition to video conferencing. This, in turn, reduces the cost of using the technology. NetMeeting is a DVC application.

Before you learn how NetMeeting performs the magical task of transmitting video between two locations, you need to understand the principals and limitations of this emerging technology.

The first time you use NetMeeting for a video conference, you may be disappointed that it doesn't have the same quality as your TV, although someday it might. Several factors restrict full-screen, full-motion video transmission over the Internet and on your PC.

The NetMeeting video features offer a great deal. And you can do a lot to improve the quality of your video conferences, as you'll see in this chapter.

Video Conferencing as a Professional Tool

Video conferencing can be used by almost every profession. Businesses, banks, hospitals, and schools are just a few of the institutions that use this technology to enhance communication. Professionals can make their business more cost-effective, realizing significant savings on travel expenses to clients, colleagues, and so forth.

The computer hobbyist can also attest to how much fun it is to video conference with people around the world. And you can use video conferencing for personal communications with friends, relatives, and colleagues who may be far away. Finally, thirty years after the first videophone was shown to the world, you can add picture to your voice communication, which makes a world of difference.

SAMSUNG EXHIBIT 1017, Page 135

Businesses can use video conferencing for a variety of tasks, including corporate presentations, meetings, training, interviews, conferences, and routine communications. Companies with multiple locations can meet weekly or daily without leaving the office.

Sales meetings that use video conferencing can bridge the gap between salespeople and customers at remote locations. Video conferencing also reduces the need to fly in a job candidate from a distant city for job interviews. Companies can broadcast training sessions from a central location to employees in video conferencing rooms or even directly to their desktops.

Video Conferencing for Universities and Conferences

Distance learning is a large part of the video conferencing industry. Many universities and community colleges use video conferencing to offer courses they might not otherwise have access to because of cost or instructor availability.

Educators have learned to harness the power of this technology to teach classes from remote sites. This enables different campuses around the world to collaborate in the communication of ideas between faculty and students.

Increasingly, conference planners are inviting presenters who can't participate in person to deliver presentations via video conferencing. And there are always more conferences than any one person can attend.

Some conferences are exploring the option of holding live events via video conferencing so participants can attend without leaving the office. I remember one conference where Bill Gates, CEO of Microsoft, was piped in to speak.

Video Conferencing for PR and Crises

Executives of organizations can use video conferencing to communicate with all their employees at one time instead of sending out a videotaped message or a memo. Restructurings or changes in human resources policies can be communicated much more humanely via a video conference than in a memo or by broadcast email.

Crisis situations and public relations efforts that need immediate attention can be handled more effectively when distant decision-makers can see each other. Though NetMeeting does not yet provide broadcast capability, it may well be available in the future. Another Microsoft product, NetShow, can be used to broadcast video and audio on a network.

Telemedicine

The medical industry has a term for combining video conferencing and medicine: *telemedicine*. Telemedicine enables a specialist's expertise to be communicated to a remote location without physical travel. This is important in isolated areas of the world because most specialists are concentrated in metropolitan communities.

SAMSUNG EXHIBIT 1017, Page 136

Trials of home systems are also being conducted to allow a doctor to monitor patients being cared for at home. A doctor can call and speak with a patient who may be hundreds of miles away.

The advent of NetMeeting and other lower-cost DVC systems will spawn a new breed of services and ways to use them. Banks are experimenting with adding video conferencing capabilities to automatic teller machines and kiosks to better serve customers. The same is true for legal proceedings, such as arraignments and depositions.

The possibilities are endless and only limited to the imagination. You are probably already thinking of a way that video conferencing could be used at work or at home.

VIDEO CONFERENCING TECHNOLOGY

Video conferencing technology has an element of magic. Compared with text or graphics, video data is many times more complicated. Compressing a video signal, sending it across a network originally designed for much smaller chunks of data, and replaying it on the other end is an enormous technical challenge.

Audio data simultaneously goes through the compression, transmission, and replay sequence and has to stay in sync with the video data. (Chapter 6, "Working with Audio," covers audio in detail.)

All video conferencing systems include the same components:

- A camera that captures your image
- A microphone that captures your voice
- A device that codes and decodes video signals for transmission
- A device that sends and receives the signals over a phone line or network connection
- A monitor for viewing people who are at the other end
- Speakers so that you can hear what people at the other end are saying

The large-room systems can also include multipoint control units (MCUs), which allow multiple locations to participate in a single video conference. They also can include peripherals such as keypad response systems, digital whiteboards, laserdisc players, CD-ROM players, VCRs, and audio equipment or touch-screen control units for controlling everything from the system itself to the room's lights and window shades.

SAMSUNG EXHIBIT 1017, Page 137

You can do a lot with a video conferencing system. People make a good living as video conferencing consultants. Luckily, the entire process is being simplified and that's part of what NetMeeting is about. With NetMeeting, you don't have to hire a consultant to take advantage of this emerging technology. You can just read this book.

Most computers don't come with the capability to capture video. This is done by a video capture device, a necessary piece of hardware for your computer if you're going to send video. You have several options, and they all generate digital video for NetMeeting to process via a software codec.

> **NOTE**
>
> If you don't have a video capture device installed in your computer, you can still see other users who do have video capture devices.

About Bandwidth

DVC is a form of communication that uses bandwidth, one of the industry's favorite words. We've used this term many times throughout this book, especially in our discussions of audio and data transmissions. Bandwidth has a precise technical definition. But when it's used in a nontechnical context, you can safely define it as the speed at which information flows.

Communication is the transfer of information from one place to another. The connection between the two remote sites through which information flows is a *communications channel.*

As mentioned in Chapter 4, a common analogy is that a communications channel is like a water pipe and information is like water. A communications channel, like a water pipe, is only so wide and can only allow so much water to flow through it during a given time. This is the rate of flow. Bandwidth is the rate at which information can flow through a communications channel.

Values associated with bandwidth are usually expressed in bits /sec (bps), thousands of bits/sec (Kbps), or millions of bits /sec (Mbps), which tell you how much bandwidth a data channel can handle. All of these quantities are transfer rates.

Using the water pipe analogy, bits/sec is like the volume of water that can flow through a pipe per second. The larger the pipe, the more water that can flow through it; the more bandwidth there is, the more data that can flow across the communications channel.

Both bits/sec and miles per hour are rates; one describes bandwidth and the other describes the speed of larger objects. If you exceed the miles per hour

SAMSUNG EXHIBIT 1017, Page 138

speed limit, you risk getting a ticket and if you exceed the bandwidth value, you'll degrade the quality and performance of the service.

You can calculate bandwidth just as you would speed. Say you want to travel 500 miles and the speed limit is 50 MPH. To learn how long it will take to travel this distance, you divide 500 miles by 50 MPH to get 10 hours.

By the same token, to transfer a computer file that's 1 million bytes long (1 MB) across an ordinary phone line with a bandwidth of about 28.8 Kbps (28.8 thousand bits/sec), you first need to convert the data size to bits by multiplying 1 million bytes by 8 (there are 8 bits to a byte), which yields 8 million bits. Again, you divide the data size by the bandwidth to get 277 seconds, or about 4.5 minutes.

Bandwidth can become a limiting factor when more bandwidth is needed than can be provided by the communications channel. This is known as a *bottleneck* in communications. Sending full-motion video through a communications channel needs a lot of bandwidth and in many cases you will come across a bottleneck. Next you'll find out why video takes up a lot of bandwidth.

Sending Digital Video

Video is made up of a sequence of frames played in rapid succession. Digital video, which is what your computer displays, consists of digital images. A digital image is made up of pixels. A pixel is the basic unit of a computer display. Typical computer displays are made up of 640 pixels across by 480 pixels down, or 800 pixels across by 600 pixels down. The higher these numbers, the higher the resolution.

Think of a pixel as a dot that represents a color and a very small portion of a picture. A grid of x by y pixels makes up any digital image. If, for example, each image in your video consists of 160 pixels across by 120 pixels down, or 19,200 pixels, this is the medium size of video in NetMeeting.

Full-color video consists of 3 bytes/pixel to fully describe the red, green, and blue color components of each pixel. So your 160 by 120 pixel image is really 160*120*3=57,600 bytes, which represents one frame of a very low resolution video.

Video is made up of many frames that are played in succession. A TV picture, for instance, displays 30 frames/sec, and a movie (on film) displays 24 frames/sec. Your brain, with help from your eyes, puts these sequential images together into one continuous motion picture.

This introduces another video conferencing term: *frame rate*, which is the number of still images displayed in a one-second period. This measurement is expressed in frames/sec (fps).

Therefore, you need to send 30 pictures through the communications channel each second to get the same quality as television. That's 57 Kbps x 8 bits/byte x

SAMSUNG EXHIBIT 1017, Page 139

30 pictures/sec or 13.8 Mbps/sec. The quality that is attained here is only in motion, not in resolution, because each of our video frames in this example is 160 by 120 pixels, which is lower than the resolution of your television.

If takes 4.5 minutes to transfer a 1-Mbyte file across a phone line, it's pretty clear why bandwidth is the bottleneck for DVC. Based on these numbers, using a phone line, which is the most ubiquitous communications channel in the world, it will take eight minutes to transmit one second worth of the video in our example.

Because video conferencing is a real-time application, this transfer rate is not acceptable. At a minimum, the system must be able to transfer one second of video in one second. Otherwise, the video isn't live and it certainly isn't interactive, which is necessary for any video conferencing system.

So how do you solve this bandwidth bottleneck problem? First, compress the video signal. All the examples you've seen so far use uncompressed video signals. Video is highly compressible because of the amount of redundant information between adjacent frames in the video sequence. (You'll learn more about compression later.)

Current compression technology doesn't reduce the sample video stream enough to be transmitted on a phone line via modem, so you need to get more bandwidth to the video conferencing location. Two common higher bandwidth channels are Ethernet and ISDN.

Ethernet is typically used to network computers together in offices and universities. ISDN is a public phone service that is available throughout most of the United States. You'll find out more about ISDN later in this chapter.

Packet-Switched and Circuit-Switched Channels

Ethernet and ISDN each belong to the broad categories of communications channels called *packet-switched* and *circuit-switched*. Ethernet is packet-switched, ISDN is circuit-switched, and they differ in performance and capabilities.

Packet-switched communications channels share their total bandwidth among all the users who want to access it. The channel is designed to switch packets instead of circuits. When users want to send a packet of data, they put it into the shared channel with everyone else's data. If the channel is being used by a large number of people, it takes longer to send the data than if the channel is being used by only a few people.

Circuit-switched communications channels supply connections to users that last as long as the user wishes. Standard phone lines are circuit-switched and work like this: when you dial a phone number, the phone network makes a connection to another phone. This connection is maintained until you hang up and the connection is broken. While it's active, the connection supplies bandwidth dedicated to communicating exclusively between those two phones. No other user in the system can access that bandwidth.

SAMSUNG EXHIBIT 1017, Page 140

NOTE

When you use ISDN on the Internet or with TCP/IP, this circuit-switched connection becomes a packet-switched connection. ISDN has more bandwidth than a normal phone line.

The feature that distinguishes the two kinds of channels is the availability of bandwidth to the user. In the circuit-switched channel, the full bandwidth is always available to the user. In the packet-switched channel, the user shares the bandwidth with other users.

The Internet is a giant, packet-switched network with millions of people sharing some of the same portions of the network. This is why sending video on the Internet can sometimes result in jerky movement or no movement at all.

Which is better for video conferencing? Video conferencing supplies a continuous stream of data into a channel. In theory, since packet-switched communication doesn't guarantee that the needed bandwidth is available, circuit-switched communication is the better of the two for video conferencing.

But there are drawbacks. ISDN is the only widely available form of circuit-switched digital service. A standard ISDN connection, which is affordable for the desktop, can provide 128 Kbps/sec of bandwidth. Using the same example that we gave for a standard phone line, we find that, using an ISDN line, one second of video takes almost two minutes (13.8 million bits divided by 128,000 bps).

An advantage of using the Internet for sending video is that you don't pay toll charges for using the communications lines between you and the remote site. If you're video conferencing with people overseas or at a long distance, toll charges can add up to a lot of money.

By now you can see that one second of full-motion video, which travels at 30 fps, won't fit into commonly available communications channels such as ISDN or standard phone lines. Compression is the key. But even using the compression built into NetMeeting, a one-second video sent over the phone line can only reach a rate of 10 to 15 fps.

Still, this is pretty impressive if you look at the size of digital video data. A video compressor/decompressor (codec) can shrink the video down to a manageable size (more about codecs later in this chapter).

As explained in the previous chapter about audio signals, the codec is the heart and soul of the video conferencing system, too: it encodes (compresses) a video signal so that it can be transferred across a network. The codec of the system on the other end decodes (decompresses) the signal and plays it back. To do this effectively, you need an extremely sophisticated process that saves only the essential information in the video signal and discards redundant data.

SAMSUNG EXHIBIT 1017, Page 141

Most high-end video conferencing systems use hardware codecs, but software codecs are widely used in desktop and LAN-based systems, and in NetMeeting. NetMeeting uses the H.263 video codec by default, which is part of the H.323 standard that NetMeeting conforms to. The H.261 video codec is also supported by NetMeeting.

Transmission Methods

Although the quality of the codec directly affects the quality of your video conference, the most important factor is your connection to the video conference recipient. The five most common ways of transmitting a video conference today are direct broadcast satellite (DBS), digital phone lines (ISDN or T1), regular phone lines, a corporate network (Ethernet, LAN/WAN), and, most recently, the Internet.

The Internet is what interests most readers, but the other methods are just as important. With NetMeeting, you can use any transmission method that can send TCP/IP data or connect to the Internet, although it may not be effective with video. Examples are wireless modems and cable modems; using a cable modem can be effective until everyone else starts using NetMeeting, too.

Each transmission method offers different bandwidth levels. Judging the bandwidth of the Internet is tricky because you have no guarantee of a static amount of bandwidth between you and the remote site.

In the future, you'll be guaranteed a certain Quality of Service (QoS) on the Internet. This means that you'll be able to pay a charge and reserve bandwidth for your application.

DBS, which offers the highest bandwidth, can transmit a TV-quality video conference at 30 fps. It's also the most expensive method because you have to rent time on a satellite and use some sophisticated equipment.

> **NOTE**
>
> Cable modems use bandwidth shared among all the customers in a certain geographic area. As more users demand more bandwidth, each user's share of the bandwidth decreases. Think of cable-modem bandwidth as a pie that can be split into one or more pieces. Each time it's split, the pieces get smaller.

When you watch any news program that contains interviews of remote parties, such as *Nightline*, you're seeing a direct broadcast satellite video conference in action. You can't use NetMeeting on this kind of connection—but you

SAMSUNG EXHIBIT 1017, Page 142

can come close by using the Hughes Data Service, which allows you to receive Internet packets on a home digital satellite dish. This is a one-way signal with the uplink going through any of the other transmission channels, such as a standard phone line or ISDN.

Digital T1 and ISDN lines are corporate America's most common transmission channels for video conferencing because they offer the best balance of price and performance. They're available in all major cities and a growing number of smaller communities. Cost varies depending on the geographic area and how many ISDN lines are used for the conference. But overall, the benefit outweighs the cost for many corporations. (More about ISDN and video conferencing later in this chapter.)

Video conferencing over a corporate Ethernet offers frame rates typically in the range of 10 to 20 fps. Quick hand movements are blurry but you can see a participant's facial expression. The Internet is slower, a jerky 5 to 10 fps, but the quality is good enough to see what the other person looks like.

Another challenge, as you learned earlier, is that no matter what your connection, video and audio have to be synchronized. This is done during the decompression and playback phase, and nearly all systems have trouble doing this perfectly. Even if the video and audio are only slightly out of sync, it's very noticeable.

A good way to test how well the signals are synchronized is to count from one to ten showing your fingers in front of the camera as you say the numbers. If the video and audio are in sync, your speech (coming out of the remote speakers) corresponds exactly with the numbers on your fingers (displayed on the remote screen).

Understanding Video Conferencing Standards

Assuming that your video conferencing system is using a good codec, who can you conference with? Most early users of NetMeeting conferenced only with other NetMeeting users, but you may want to conference with someone on a different system.

Compressed data bears little resemblance to its original form. So when your codec sends data to someone you want to talk to, that person's codec needs to understand what yours is sending. This is called *interoperability*. If both participants use the same codec, they can communicate; if they don't share a codec, they can't.

The participants must also be able to communicate simple signals such as when to start and stop sending video. The format of the video data is also very important.

There are many codecs and many ways for computers to communicate. That's why the International Telecommunications Union (ITU) created the H.323 international standard, as explained in the previous chapter. This standard dictates the

SAMSUNG EXHIBIT 1017, Page 143

methods and processes used for a video conference on a packet-switched network. Another standard, H.320, applies to direct ISDN connections.

H.323 includes the H.263 video codec, which performs very well. Unfortunately, it also needs a lot of CPU power for good quality. The multimedia extension (MMX) technology embedded in the processor helps to lower the processor load for audio and video compression and decompression.

As you also learned in Chapter 6, "Working with Audio," without standards, it's impossible for multiple vendors to create products that can communicate with one another. This is especially important for communications products.

VIDEO ON COMPUTERS VERSUS VIDEO ON TV

So far, you've learned in detail about the complexities of video conferencing technology. TV, too, involves a complex technology, but anyone can set up a TV. People are accustomed to the simplicity of plugging a TV set into the wall and hooking up an antenna or cable.

Someday, setting up a video conference will be just as easy, and the quality will be as good as or better than TV. It takes time for the public to adopt a new technology, which gives developers and engineers time to perfect it.

In the past, the cost of video conferencing has been prohibitive. DVC helps bring the cost down by using the widely available PC. Faster, cheaper processors for the PC that can handle video conferencing give the ordinary user an incredible amount of computational power.

You can expect this trend to continue. The next-generation TV will have the same processing power as your PC. In fact, two different mediums, TV and the PC, are beginning to merge. WebTV is an excellent example of how the two are coming together. These two mediums process video very differently, however.

One difference is analog versus digital. Your TV displays analog video and your computer displays digital video. This makes sense because the TV is an analog device and your computer is a digital device.

An analog device uses signals that can vary in frequency and amplitude to carry a signal, whereas a digital device uses ones and zeros (on and off) or bits to carry the signal. A digital device is usually more flexible and intelligent than an analog device.

The computer is the granddaddy of all digital devices. It has a complex set of instructions and capabilities that make it flexible and powerful. What other device can be used for entertainment and also to balance your budget?

Video is really an illusion. It was first used for motion pictures—a sequence of images played back in rapid succession relied on the viewer's brain to make it look smooth.

SAMSUNG EXHIBIT 1017, Page 144

Since a computer is a digital device, it presents digital video. But we live in a world that's not digital (only computers and nerds can deal with digital). So if a video made in the natural (analog) arena is to get into your computer, it must be converted. Most video is made in this way, but some are created by the computer and born as digital movies. You have seen some of this last type in the movie theater as special effects.

When the "bad terminator" melts down in *Terminator II*, you're watching a digital effect that has been converted to an analog medium—digital video frames were converted to analog frames.

Setting Video Resolution and Color

The color resolution of your monitor and video card greatly affects the quality of the video display. If your display can only show 16 or 256 colors at one time then the color of the video will not look realistic. Most of the newer computers come equipped with SVGA displays that can display millions of colors (16-bit or 24-bit).

You can check to see how many colors your display is capable of by going to the Control Panel and double clicking on the Display icon. Next, select the Settings tab. This will bring up the Display Properties window, as shown in Figure 7-1.

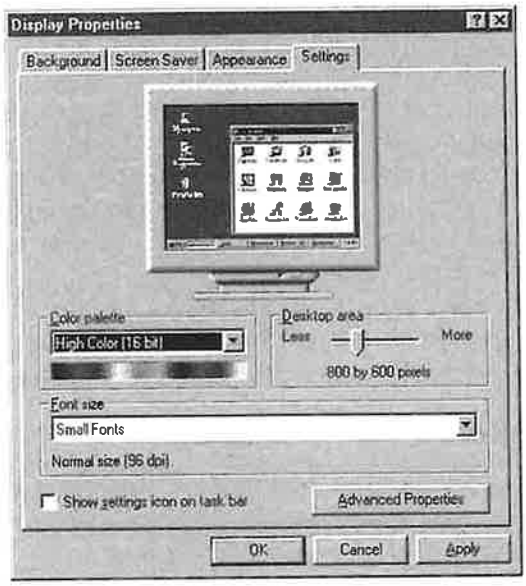


Figure 7-1. *You can determine and change the number of colors on your display in the Display Properties window.*

SAMSUNG EXHIBIT 1017, Page 145

Look in the Color palette area. Here you will see the number of colors that are available to your display. This setting can range from 16 colors to millions of colors. In this illustration, the display is set to "High Color (16-bit)" (65,536 colors), which is the optimal setting. If your display is capable then this setting and "True Color (24-bit)" (millions of colors) will be available. True color is the highest setting and provides crystal clear images. Select a resolution higher than 256 colors, if it is supported, to get the best results from the video conferencing feature of NetMeeting.

If you do not have these options available then you may need to get a new SVGA card and monitor. Or you may be able to upgrade the existing SVGA card with more memory. You should check with the manufacturer to see if there are new drivers that support these higher display modes. Sometimes these options can be made available by simply installing new software.

SHOPPING FOR VIDEO CONFERENCING EQUIPMENT

To send video with NetMeeting, you need to add a piece of hardware to your computer that can capture digital video and relay that digital video to NetMeeting for transmission. This hardware is called a *video capture device* and you'd be surprised how many different companies manufacture this type of equipment.

Video capture devices have been around for a long time. Until recently, however, the capture was jerky and the images were low quality. Two kinds of video capture devices are available for your computer: input/output(I/O)-port cameras and video capture cards.

An I/O port is either a parallel port or a serial port. This kind of video capture device, the I/O-port camera, is usually cheaper and easier to install than a capture card. But it also produces lower-quality video and needs more of your computer's CPU power to process the video.

If you're using NetMeeting's video conferencing commercially, the video capture card is your best option. If NetMeeting is for your casual personal use, the I/O-port cameras work well and the price is right.

Parallel-Port and Serial-Port Cameras

Most PC-compatible computers today come with one parallel port and two serial ports. These are I/O ports commonly used for a printer (parallel) and a modem (serial). The names of these ports tell you how the data is communicated between an external device, such as a printer, and the port controller. Some PCs come equipped with a Universal Serial Bus (USB) port, which is a more advanced version of the serial port, that supports many devices and higher data throughput.

SAMSUNG EXHIBIT 1017, Page 146

A parallel port sends eight pieces of information at the same time or *in parallel* and a serial port sends only one piece of information at a time. These ports, traditionally used for a printer, modem, and mouse, are now also used for a new generation of device: digital cameras.

Connectix was the first company to come out with a parallel-port, digital camera for the Macintosh that could capture black and white video, then with a camera for IBM-PC compatibles, and, finally, with a color version. These products are called the Quickcam and the Color Quickcam, respectively. You may have seen the little round cameras in the store or sitting on top of a friend's computer: they were the first and sold very well. The newest member of this family is the Quickcam VC, which uses the USB port and, as you might expect, outperforms its predecessors.

The Quickcam sells for under $100, the Color Quickcam sells for about $200 and the Quickcam VC sells for around $100. Considering that the only alternatives to this type of camera cost into the thousands, this was a great deal. Soon Connectix had competition from other cameras that used either the parallel or the serial port. However, the Quickcam is by far the most popular of this class of video capture devices.

I/O-port cameras are all-in-one units that draw power from the keyboard port and send data through the parallel or serial port. This is good for the novice because you don't have to open up the computer to install the camera. They're great cameras if you want to play with the technology or take still pictures. You can use these cameras either with a laptop or a desktop computer.

One disadvantage of the I/O-port camera is the quality of video it produces. A limited amount of data can come through a parallel or serial port and it's *much* less than what's needed for good-quality video. To compensate for this limitation in bandwidth, the frame rate and image quality are usually reduced.

Another disadvantage is that much of the video processing takes place in the camera housing and software drivers, and the software drivers can take a lot of CPU time. Still, with enough time to process a frame, these cameras can produce good-quality, high-resolution images.

Video Capture Cards and Your Camcorder

I/O-port cameras, however, can't give you the real-time video you need for effective business video conferencing. A video capture card is the only solution for high performance and good quality. This card converts any analog National Television Standards Committee (NTSC) signal into digital video for NetMeeting to use, and some even support Super Video Home System (S-VHS) format.

In addition, a video capture card does the intensive processing so your CPU doesn't have to work as hard as with an I/O-port camera. The two problems with this card are price and difficulty of installation.

SAMSUNG EXHIBIT 1017, Page 147

A video capture card can cost from $100 to $2,000, depending on the quality and capability. On average, a good video capture card costs about $200 to $300 and can be found in most computer stores, computer magazines, and mail-order catalogs.

You may think this is a pretty reasonable price to add video capture to your computer. It is—until you add the price of a camera, which usually costs as much, if not more, than the card.

Manufacturers have created bundles that include the camera and the card at a discount from what it would cost to buy them individually. Winnov (http://www.winnov.com) is a good example of a company that offers a video capture card and camera bundle of great quality at a reasonable price.

If you're using NetMeeting at home, you may already have a camera sitting in the closet collecting dust. Yes, the camcorder you bought to record all those precious moments can now be put to good use with your computer. A camcorder puts out a standard video signal that can be captured by your card. You may need to get a tripod, but that doesn't cost much.

In contrast to an I/O-port camera, a video capture card is installed by opening up your computer to plug in the card. You may also have to change some settings to make it work properly.

By now, you might be saying, "Yeah, plug and pray, right?" Well, most manufacturers are getting better at helping people add this kind of hardware to their computers and they provide pretty good installation manuals.

When buying a video capture card, look for phrases like "Easy to install" on the packaging or in the product literature. Once average users get over their phobia about opening up the computer, installation can be straightforward. If you're serious about video conferencing, the pain of installation is well worth it.

Using Multiple Cameras

Using Windows, you can install multiple video capture cards on your computer and switch between them by selecting the one you want. Click Start, Settings, Control Panel, Multimedia icon, Advanced tab, Video Capture Devices icon. Here you'll find the Windows settings and the video capture device driver you need. You can select which video capture driver is active in the Driver Properties window (Figure 7-2). NetMeeting will also let you select the capture driver being used from the Video tab of the NetMeeting Options dialog (shown in Figure 7-3).

Video conferencing is one of NetMeeting's most complex components but it's also one of the easiest to set up. You can only change a few features on any digital video, including video frame size, quality, and camera properties.

SAMSUNG EXHIBIT 1017, Page 148

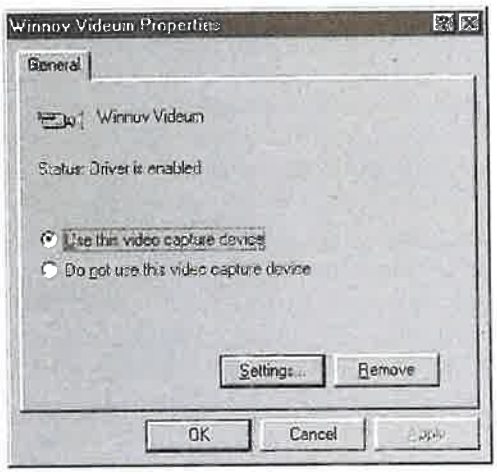


Figure 7-2. *Select the device driver under Multimedia Devices on the Multimedia Properties window.*

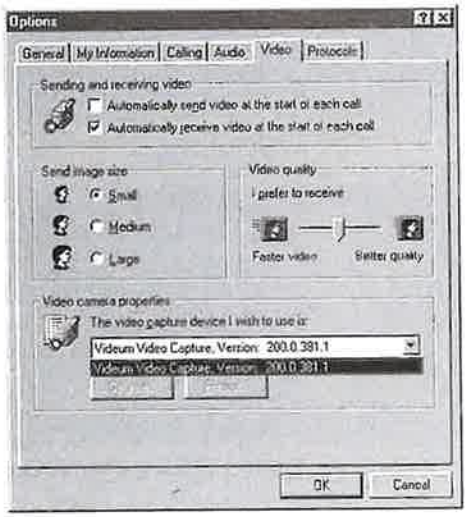


Figure 7-3. *Choosing the active video capture driver on the Video tab of the NetMeeting Options dialog.*

The first two features are fairly simple because they're the same for any video device. Camera properties are a different story because these are different for each manufacturer. But the Video for Windows standard helps keep the interfaces consistent.

SAMSUNG EXHIBIT 1017, Page 149

You can use several features to change the look and feel of the user interface and to control the flow of video. You can detach both the remote or local video windows with a mouse click. You can also turn off the video or choose not to see the remote person (in some situations you may not want to see the person).

In fact, the ability to manipulate the video in this manner gives you tremendous power over the flow of information between two connected computers. Microsoft has created an easy-to-use, innovative user interface for NetMeeting version 2 that integrates all the video conferencing components.

There are only a few video buttons and you should be able to make adjustments as needed (you'll learn about the video features next). The incoming and outgoing video windows are located on the Current Call screen of the NetMeeting user interface, as shown in Figure 7-4. Even if you are not connected to anyone, you can click on Current Call to access this screen and test your video.

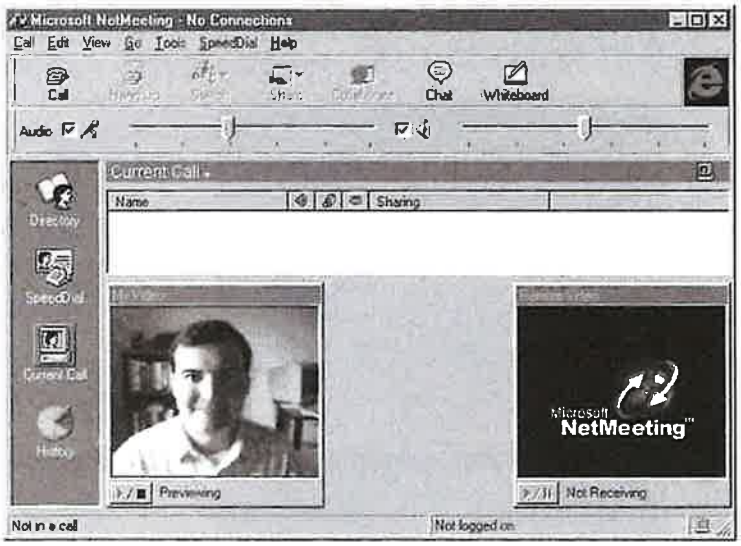


Figure 7-4. *The Current Call screen of the Microsoft NetMeeting window is how you access the video features.*

The Video Controls Under Tools|Options

To adjust the NetMeeting video features, you can either click Tools, Options, and select the Video tab or right-click the My Video or Remote Video windows and select Properties from the pull-down menu. This takes you to the NetMeeting Options window (previously shown in Figure 7-3), where you configure video transmission control, video size, video quality, and camera properties. Figure 7-5 shows the video options on the NetMeeting Options window.

SAMSUNG EXHIBIT 1017, Page 150

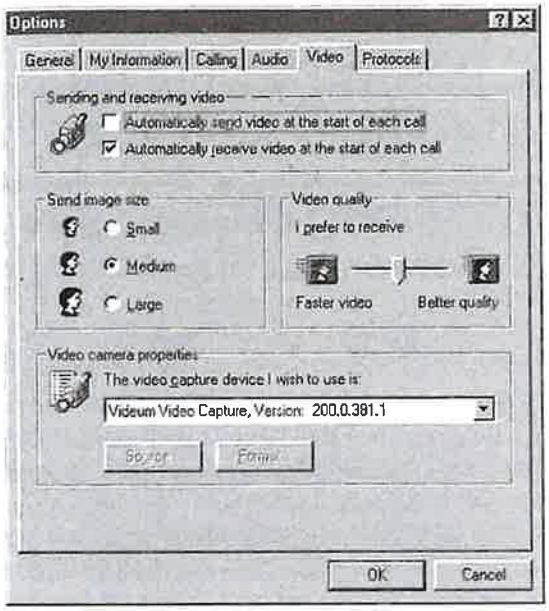


Figure 7-5. *Configuring the video features on the NetMeeting Options window.*

If these video features aren't enabled (if they're dimmed out), NetMeeting has not found a video capture device in your computer. If you have one installed, see Chapter 16, "Troubleshooting Video."

The top pane on the NetMeeting Properties window, "Sending and receiving video", controls the flow of video in both directions when you first make a connection. You can choose not to send or receive video at the beginning of a connection but why would you do that? One reason might be for security—you might first want to make sure, through the audio portion or chat area, that it's safe for the other person to see you and your surroundings.

And you may not want to see the other person unless you're sure it's someone you know. If you use NetMeeting on the Internet, people you've never met in person might call you and it is up to your discretion whether you allow them to connect and communicate with you. The "Sending and receiving video" option is provided for security.

The next pane, "Send image size", offers three sizes to choose from: small, medium, and large. The larger the image size, the more bandwidth is needed, which affects the frame rate if you're using NetMeeting with a modem connection. You can usually choose small or medium and have a pretty good exchange.

The actual x and y pixel dimensions of the video for each of the three sizes follow. Note there are two slightly different sizes for each. Common Interchange Format (CIF) is the base size for standards-based video conferencing systems.

SAMSUNG EXHIBIT 1017, Page 151

If the capture device handles the standards-based sizes, which are slightly larger and have a different ratio from the figures given, those sizes are used by NetMeeting. The following table shows the image sizes used by NetMeeting:

NETMEETING'S IMAGE SIZES

Size	*Dimensions*
Small	80 x 60 or SQCIF (128 x 96)
Medium	160 x 120 or QCIF (176 x 144)
Large	320 x 240 or CIF (352 x 288)

The third pane on the NetMeeting Properties window is the video quality slider, which you use to choose between frame rate and image quality. The quality of video can be measured by the number of frames displayed in a one-second interval. If more frames are sent, the amount of data required to transmit the video is generally larger.

This is not true of the codec used with NetMeeting. You can choose to degrade the image to increase the compression ratio and so increase the number of fps you can send. (You'll learn more about codecs later in this chapter.)

Move the quality slider to the left to get lower-quality images and a faster frame rate or move the slider to the right to get higher-quality images and a lower frame rate. The relationship between image quality and frame rate may not apply if your communications channel has more bandwidth than a standard phone line. If the channel can handle high-quality and high-fps video, NetMeeting will send it.

The fourth pane on the NetMeeting Properties window is the camera controls, which give you access to the video capture device installed on your computer. Some video capture devices don't support the control options in the Video for Windows specification. In this case, one or both of the two buttons on the camera controls pane may be disabled (dimmed out).

CAUTION

When using NetMeeting on a local area network (LAN), be aware that you're using a shared resource. Configuring the video to transmit the highest quality and largest video size may lower the network's performance for your colleagues.

Always let your network administrator know that you'll be using a video conferencing application on your LAN/WAN. Your video conference could make it difficult for your colleagues to send other important information because of the amount of network resources required.

SAMSUNG EXHIBIT 1017, Page 152

The Source button gives you control over the video source for your video capture device. You may be able to select a different camera or configure how the source video is digitized. Use the Format button to change the video size and compression. Since NetMeeting can control these settings for you, the buttons may be dimmed out and you will only be able to change these settings through the NetMeeting interface.

Controlling My Video and Remote Video

The My Video window is where you preview yourself on the screen to test the video before you send it. The Remote Video window is where video from the remote user is displayed. You get to these windows via the Current Call tab of NetMeeting's main user interface, unless they're detached from the interface.

Detaching either of these windows from the main user interface gives you more power to manipulate the video displayed in the window. When these windows are "docked" on the interface, they are fixed in size. You should be aware that the amount of data sent for video is still large, but will be displayed in the small window in this situation. When you detach the window, you have total control over the window's placement and some control over its size.

You can detach the My Video or the Remote Video window by choosing Detach My Video or Detach Remote Video under the View or Tools Video menu options on the main menu, or from the pop-up menu of either window. You can display the pop-up menu by clicking the right mouse button on the window.

In Windows, most windows and objects have pop-up windows, and you can activate them by right-clicking the window or object. Figure 7-6 shows the pop-up window for the My Video and Remote Video windows.

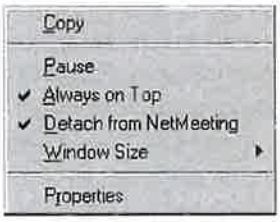


Figure 7-6. *Viewing the My Video or Remote Video pop-up window and menus.*

You'll also notice that some of the options on the pop-up window are only enabled when the window is detached—the size, for example. This is because you can only change the window size when the window is detached.

The pop-up menu on both windows lists six options: Copy, Pause, Always on Top, Detach, Window Size, and Properties. You've already read about Detach and Properties. You can select the Copy option to copy the current video image onto the clipboard. This is helpful when you want to put a video image on the Whiteboard or into another application.

SAMSUNG EXHIBIT 1017, Page 153

> **NOTE**
>
> Here are two shortcuts for detaching and reattaching the My Video and Remote Video windows: When you drag the window away from the interface, it automatically detaches itself. To do this, hold down the left mouse button on the window's title bar and move the mouse away from its current location.
>
> To return the window to the interface, drag it back to its original location and it automatically reattaches itself. You can also double-click the title bar with the left mouse button to attach and reattach the window.

Click Paste in the other application and the image you copied reappears. The Pause option stops or starts the local or the remote video. If the window is detached, you can select Always on Top so it can't be covered by another window. Most users have to play with this first to make it work, so give it a try.

As you already know, you use the Size option to specify how big you want to stretch the window. This doesn't increase the resolution or the size of the video you receive: it's a simple algorithm that produces a larger image. Remember that you have to detach the window to change its size.

OPTIMIZING YOUR VIDEO CONFERENCE

You can do several things to improve your video conference. Believe it or not, there are people who specialize in training corporate employees on the ins and outs of video conferencing as a way of doing business. Imagine having a coach for video conferencing! Well, this section is your VC coach.

You can use these tips for any video conferencing application, although some are geared more toward business. If you're using NetMeeting for personal applications, you may not be interested in some of the tips toward the end of this section.

Your environment is very important to the video conference. When you hook up a camera to your computer for NetMeeting, you'll see that lighting, background, and colors can't be taken for granted and may have to be altered.

You may even want to rethink the clothes you're wearing. There are good reasons for this, and most have to do with how the computer interprets digital video and how the codec works.

Here are a few tips:

- Wear solid colors.
- Keep movement to a minimum.

SAMSUNG EXHIBIT 1017, Page 154

- Use a solid background.
- Use a closed space such as a room or cubicle.
- Make sure that you're well lit by using good lighting.
- Zoom in or be as close to the camera as possible.

The computer sends video that is as good or typically a little worse than what the camera sees. These tips help create a good environment for the codec and prevent the transmission of unnecessary information.

The purpose of controlling your environment is to work with the bandwidth and frame rate available to you. When you don't have a lot of bandwidth, you need to look at ways of leveraging what you do have.

The codec used by NetMeeting takes advantage of the fact that parts of the video won't change over time. So by following these suggestions, you can increase the amount of redundant information and decrease the complexity of the video images.

If you were to set up a video conference station in the middle of a mall, wear a striped shirt, and stand 20 feet from the computer, you would have successfully created one of the most complex video streams for the computer to compress and transmit. Sporting events are also complex. But you probably won't be video conferencing from a football field—or from a mall, for that matter.

Set yourself up in front of the camera with control in mind. Sit in a "power" position during a video conference so the remote participants feel that you're in control when they see you on the monitor. Sit as close to the camera as you find comfortable. Your head and shoulders should fill the screen and the audience should be able to see your facial expressions, which are crucial to visual communication.

For very important video images, you may want to use the Whiteboard to transmit the images. Most video capture devices provide software that you can use to take high-resolution pictures and paste them into other applications, such as NetMeeting. To find out if you have these tools or to learn how to use them, see the user guide or online documentation supplied with the video capture software.

You can also copy any displayed window onto the clipboard and paste it onto the Whiteboard. The self-view window can be copied into the clipboard if it's detached from the interface. (See Chapter 5, "Chat and Whiteboard," for more on pasting windows into the Whiteboard.)

During a business presentation, the elements you currently use to communicate, such as computer-based or traditional slide shows, overhead transparencies, videotapes, multimedia, and music, can be used just as effectively in

SAMSUNG EXHIBIT 1017, Page 155

a video conference. The difference with a video conference is that you have to pay more attention to transitions between each element. This is because, instead of sitting across the table from you, the audience is sitting in a room a thousand miles away staring at a monitor. That distance changes the presentation dynamics.

Another key difference is preparation time. Video conference presentations plainly need more preparation time. You can't simply walk into the room and wing it as you might in a face-to-face presentation. In addition to logistical issues, such as making sure handouts reach your audience in time, you need to structure your presentation clearly and then stay with your agenda.

If you tend to take cues from your audience and jump ahead or backward during face-to-face presentations, you'll find presenting from a distance frustrating. It may be hard to gauge audience reactions unless you're broadcasting at the highest transmission levels.

Instead, it's better to create a solid outline and stick to it. Here are more tips for using video conferencing for business presentations:

Focus on creating interaction between you and the remote viewer. Most people don't take advantage of the uniqueness of the video conferencing medium, perhaps because it's not the traditional way to communicate ideas. But video conferencing can be more effective than a live presentation.

One way to create audience interaction is to send a list of questions to the remote site. Next, shorten the time you talk, and ask the audience which questions they would like answered. You don't want to answer every question.

Make yourself an integral part of the presentation and bring together NetMeeting features such as the Whiteboard and application sharing to enhance your ideas. Avoid merely putting up a series of graphics and talking about them. If you're going to do that, you might as well send printouts by mail and walk the remote participants through them on the phone. Instead, take advantage of the tools at your fingertips.

When you're using the Whiteboard or application sharing, don't keep one visual on the screen too long. Because video conferences feel somewhat like TV, the audience often gets restless if the image changes too slowly. Try to change the image as often as you can. Every 30 seconds or so is a good interval, but it depends on your style of presentation.

If you use graphics with the Whiteboard, take care when creating them. These can represent important concepts that you don't want to lose in the communication. The Whiteboard can be used to transmit graphics simply by copying them to the clipboard (Ctrl + C in most applications) and pasting them into the Whiteboard (Ctrl + V), in the same way as you can paste windows, as mentioned earlier in this section.

SAMSUNG EXHIBIT 1017, Page 156

Break your presentation into five-minute or six-minute segments. People learn and understand better when information is organized this way. Segmenting your presentation also facilitates interaction with your audience. Present for five minutes, then use a case study to emphasize your point; bring in a quotation from an expert or ask if there are any questions.

If both computers participating in the conference have access to the Internet or a company Web server, you can use that as a resource, too. You can do this by asking the remote party to load Internet Explorer (or another Web browser) and send a list of Web links to them. This will allow you to integrate information from the Web into your presentation.

UNDERSTANDING THE ROLE OF CODECS

As you've seen so far, digital video data is one of the most complex data types processed by a computer. The pure volume, and the timing needs, make a tremendous amount of work for the computer. And this complex data must be transferred through a communications medium for replay on a remote computer.

When you use a common, affordable communications channel like a phone line or ISDN, the video data has to be compressed. This is where the video codec comes into play. As we've briefly mentioned in this chapter, and in the previous chapter on audio, the codec uses a mathematical algorithm to reduce the size of the video and to return the compressed data to a close representation of the original.

You can achieve this "close representation" using techniques that make compression effective without changing the visible quality of the video. You can also use techniques that greatly affect the video's visible quality. You'll learn about both techniques in this section.

You'll hear a lot of different words when referring to video codecs: obscure mathematical algorithms like the *discrete cosine transform* or *finite vector quantization*, and equally unhelpful assurances that a codec complies with one standard or another. Don't break into a sweat, because how the compression is done doesn't concern the average user.

If this interests you, however, there are many resources on the Internet that provide information on various video compression techniques and algorithms. The questions you want to ask are how well the codec performs, how it operates with other video conferencing products, and how well it works on networks or communications channels with variable or low bandwidth. Knowing the answers to these questions will give you a greater understanding of the video conferencing process and can ultimately increase the quality of your conference.

SAMSUNG EXHIBIT 1017, Page 157

Lossless and Lossy Codecs

A codec's performance is usually measured by its compression ratio, a simple fraction that relates the size of the data before it's compressed to the size of the data after it's compressed. If a given codec takes a chunk of data that is 1000 bytes and returns a chunk of data that is only 500 bytes, it has a compression ratio of 2:1.

Most codecs perform differently for different kinds of data. In general, running a codec on already-compressed data won't reduce the size of the data. Thus compression ratios are usually an average ratio for the data typically handled by a codec.

There are two types of compression that can be used to decrease the amount of data that is transmitted or stored: lossless and lossy compression. The method used in ZIP files is an example of a lossless data compressor. With lossless data compression, the original data that you compressed will be exactly the same as the data that you decompress. This may not be very intuitive, but lossy compression does not guarantee that the decompressed data is the same as the original data that was compressed, thus the term "lossy."

The type of compression, lossless or lossy, is an extremely important factor when you're compressing programs or other data files because you always want to get the same thing out of a compressed file as you put into it. When you use lossy compression, however, loss of quality is not so important because there are many components of video and images that can be lost without your eye noticing the difference. Some components of a lossy compressor can be seen, but you can generally still tell what the image is even though it can be blurry.

In this section, you'll see a series of video images stored using the Joint Photographic Experts Group (JPEG) format. This is a lossy compression method in which some data is deliberately discarded to achieve massive reductions in the size of the compressed file. This method is similar to the method used by the H.323 video codec, H.263, within NetMeeting. JPEG and H.263 both use some of the same algorithms to eliminate redundant visual information.

A nice feature of lossy compression is that you can specify the quality of the compression to be done by specifying the amount of loss that is going to take place. The size of an image compressed with a high-quality setting is generally larger than the same image compressed with a low-quality setting. JPEG uses a percentage to represent quality, in which 0 percent is the lowest and 100 percent is the highest.

When you can specify the quality of the compression, you have the advantage of trading size for quality. With NetMeeting, you can also set the quality of the video you get from the remote person.

SAMSUNG EXHIBIT 1017, Page 158

Figures 7-7 through 7-12 are a series of video images, each with a caption describing the quality specification and length of the resulting file. Notice how dramatically the file length drops as the quality specification decreases. The resolution of this image is 320 x 240 and it was captured in 24-bit color. When uncompressed, the image is 320*240*3 bytes/pixel=230,400 bytes in size.



Figure 7-7. *This image has a quality specification of 100 percent and a file size of 71 kilobytes.*



Figure 7-8. *This image has a quality specification of 75 percent and a file size of 16 kilobytes.*



Figure 7-9. *This image has a quality specification of 50 percent and a file size of 10 kilobytes.*

SAMSUNG EXHIBIT 1017, Page 159



Figure 7-10. *This image has a quality specification of 25 percent and a file size of 7 kilobytes.*



Figure 7-11. *This image has a quality specification of 10 percent and a file size of 4 kilobytes.*



Figure 7-12. *This image has a quality specification of 0 percent and a file size of 2.5 kilobytes.*

Without the captions, it's hard to distinguish the 100-percent image from either the 75-percent or the 50-percent image. With that in mind, look at the compressed image sizes. The 50-percent image is roughly 4 percent of the original image's file size. That's a compression ratio of 23:1.

Even the 25-percent image is not bad, and it has a compression ratio of close to 32:1. If you take these new numbers and look at the bandwidth bottleneck again, a compression ratio of 32:1 compresses the 13.8 Mbps (megabits per second) video example from earlier in the chapter to only 0.43 Mbps. This is starting to get managable if you consider that the example video is a 30-frame/sec video sample, which is high quality. If we apply this ratio to our example

SAMSUNG EXHIBIT 1017, Page 160

still frame then the 57.6 kilobyte still frame compresses to 57.6 divided by 32, which equals 1.8 kilobytes. This size is getting to the point at which we can send multiple images in a one second period on a modem. We could send about two of these 1.8 kilobyte images per second on a 33.6 modem.

When the compressor is set to 0 percent, the size continues to drop, but not as dramatically as the previous values. The size of the compressed image and the setting of the compressor is not linear. As you can see, quality gets increasingly worse and we are faced with the question of whether we would rather use an image with a small size that is barely recognizable, or one that is a bit larger and more clear. Clearly, we choose the latter of the two. You will have to ask yourself "Do I want high frame rate or high image clarity?" You can also choose to select something in the middle of the two.

Redundancy in Video Data

What we have examined so far is still-image compression, which is one component of a video codec. Redundancy in video data is anything that doesn't change over time; this redundancy can be removed by the video codec. For example, in most video conferences, someone is talking and the background is static. The unchanging background, which may comprise a larger percentage of the video, represents this redundancy that the video codec can eliminate.

A good video codec, such as H.263, can detect this static information, and compress and transmit only the information that changes. This greatly reduces the amount of information and blows our compression examples out of the water because the calculation is no longer linear.

Thus more movement in the video produces a larger compressed video sequence or a lower compression ratio. You can see this when the scene changes during a video conference, and the movement gets jerky or stops for a moment.

Although the numbers you've just looked at seem to remove or reduce the bandwidth bottleneck, they really just move the bottleneck to a different part of the system.

Executing a codec can take a lot of time. In general, the higher the compression ratio, the more calculations are needed and the longer the calculation takes. The H.263 codec can produce higher compression ratios and higher video frame rates only if there's enough CPU available for the calculations.

The higher frame rate and larger video image size also create additional computations. This is why the evolution of the processor inside the PC is so important to DVC applications.

Without the computational power to use a codec in the software, you need expensive hardware designed to use the codec. This is how the large video conferencing systems work.

SAMSUNG EXHIBIT 1017, Page 161

Some DVC systems use a hardware board to compress and decompress signals. MMX technology includes instructions for video data compression/decompression based on H.263. As a result, every PC equipped with an MMX processor has the ability to execute the portions of the H.263 codec faster and more efficiently than a computer not equipped with MMX.

NetMeeting's use of the codec in software is an important feature because, in the past, the codec was one of the most expensive components of a video conferencing system. Microsoft and Intel have licensed these software codecs for all machines running the Windows operating system, so you don't have to pay to use them. (Actually, you paid for them when you bought Windows.)

Graceful Degradation

The behavior of a video conferencing system using a packet-switched channel that is heavily loaded is called *graceful degradation*. As the load on the channel increases and the bandwidth available to the video conferencing system decreases, what is the effect on the system's performance?

Some codecs, like H.263, first send very coarse information about the video image across the channel, then successively refine the image if they have enough bandwidth left to do so. Others may start from the top of the image, and if there isn't enough time to finish the bottom half of the image, it doesn't get drawn. This can be annoying if someone's face is below the point where the codec stops drawing the image.

Improving Video Performance with ISDN

ISDN is not just another phone service. It's a radical evolution of the phone network. ISDN enables voice, video, and data with unprecedented harmony. Data services, especially LAN-to-LAN and connections to the Internet, greatly benefit from ISDN. The most important aspect of ISDN is that it can dramatically improve the quality of NetMeeting connections by providing more bandwidth than a standard telephone. Video conferencing with NetMeeting on ISDN is leaps and bounds better than using a PSTN line. Because ISDN is digital (versus analog), it has greater flexibility and a broader range of use than a phone line.

The integration of different services has become an ISDN hallmark. In the past video, audio, voice, and data services needed at least four separate networks. Video was distributed on coaxial lines, audio on balanced lines, voice on copper twisted-pair cables, and data services on coaxial or twisted-pair cables.

This multiple environment was expensive to install and hard to maintain. ISDN is different. It integrates voice, video, audio, and data over the same net-

SAMSUNG EXHIBIT 1017, Page 162

work with quality not available in previous switched services. ISDN offers features such as on-demand networking, automatic bandwidth, and on-the-fly connectivity. These are available, in large part, because ISDN is digital.

A disadvantage of the Plain Old Telephone Service (POTS) we know so well is that it's analog. This is a problem for data applications: computers are digital devices, complicating the transmission of data over analog lines.

On the sending end, a computer's binary ones and zeros are converted to a series of analog tones by *modulation*. On the receiving end, *demodulation* converts the tones back to ones and zeros.

A modulator/demodulator (modem) is the device that makes this conversion. It's an inefficient process in which tones can be corrupted by noise, echoes, and line spikes. Bandwidth is limited. Today's codecs have pushed the top of the bandwidth envelope, but today's modem speeds are close to their maximum.

Effective networks and video conferencing need high-speed connectivity. Since it scales in increments of 64 Kbps, ISDN is an excellent vehicle for connecting LANs. ISDN is itself a digital network; however, ISDN doesn't stop at the building, campus, or even the city boundary.

ISDN is a wide area network (WAN) offering regional, national, and international connectivity. Because of its speed and digital nature, you can connect to a corporate LAN half a continent away, creating an intranet, as easily as you connect to the LAN across the hall.

Understanding ISDN

ISDN was designed from the ground up as a digital service. Even voice calls are passed to the phone network as a digital data stream. Because the phone network itself is digital, ISDN can interface to it directly.

This is good news for computer networking. Network devices, such as bridges or routers, can output their digital signals directly, without converting them to analog tones. End-to-end digital connectivity results in higher speed connections and significantly reduced error rates. This makes WAN connections efficient and reliable.

The magic behind ISDN is the intelligent CO switch, a large mainframe computer with many I/O ports. A number of switch vendors offer both ISDN CO and private branch exchange (PBX) switches. You need to know which switch supplies your ISDN service because some ISDN devices only work with a particular switch.

Even devices that work with a variety of ISDN switches can have compatibility problems. Be sure to ask your phone company which kind of ISDN switch serves your location. The switch type will not effect your use of NetMeeting, it is a matter of configuring the ISDN modem.

SAMSUNG EXHIBIT 1017, Page 163

The NI-x standard is an attempt to correct compatibility problems, with varying degrees of success. Unfortunately, many phone companies have been slow to use implement NI-x (and some are downright resistant!).

So you have your new ISDN products in hand, ISDN lines will soon be installed, and you're eager to connect your sites. But before you can make the first call, you have to enter the *switch translations* needed for every ISDN device. Switch translations are like the configurations used by network devices, such as routers. Translations include terminal type, kind of service (voice or data) needed on certain channels, and whether service is packet- or circuit-switched.

A simple error in a translation can render an ISDN line useless. To make matters worse, users are expected to provide translations for ISDN lines. It's like being asked to pilot a jet aircraft just because you were once a passenger. Your phone company should be able to help you out with this.

Translations aren't the only complexity in ISDN installations. ISDN service availability, prices, and installation needs vary widely. In addition, not all service providers are equally adept with ISDN. This can make ISDN installation an intimidating process.

Some Tips on Setting Up ISDN Service

The first step is to find out whether ISDN is available at your site and at any remote sites you plan to connect to. The simplest, although not always the most reliable, way to do this is to ask your local phone company. Several phone companies have ISDN order centers that give you information and rates for ISDN service in your area.

It's hard to predict what ISDN will cost in a given location because ISDN rates vary within states and regions in North America. Once you know that ISDN is available in your location and what it costs, the next step is *line qualification.*

The phone company does this to make sure that the copper twisted-pair cables from the CO to your location can handle ISDN. Distance limitations and loop quality have to be checked before ISDN service can be installed.

The third step is to order ISDN. The phone company will ask what services you want on the line and what the line translations look like.

Keep in mind that the services you order may directly affect your monthly rate and that entering translations is a nasty business. Although you can get translations from most ISDN equipment vendors, they may not be in a format the phone company can use.

Next, the phone company schedules a time to come to your location and install the ISDN line. It's a good idea to have your ISDN equipment set up and ready to go. That way you can check that the ISDN line is working while the installer is onsite. ISDN is still new enough for installation errors to occur.

SAMSUNG EXHIBIT 1017, Page 164

Is ISDN worth all the hassle? The answer is an unqualified yes! The value of ISDN WAN connectivity, its cost-effectiveness, and ease of use can't be rivaled by any other service, although cable modems and asynchronous digital subscriber loop (ADSL) will soon start to compete. Once you're sold on ISDN, you'll wonder **how you** ever got along **without** it.

As you **know by now**, you need b**andwidth** for effective video conferencing with NetMeeting. ISDN is a good way to add bandwidth to your home or office connections. You'll have higher video frame rates and better quality for all of NetMeeting's components.

FROM HERE...

In this chapter, I have shown you how video conferencing works and how you can use NetMeeting to add this valuable communication method to your PC. I am sure that you will enjoy using this feature of NetMeeting.

The following chapters offer more information about video conferencing:

- Chapter 16, "Troubleshooting Video," contains valuable information about finding and fixing problems relating to the video features of NetMeeting. This is a great chapter to turn to if you are having video problems.
- Chapter 6, "Working with Audio," discusses the audio portion of NetMeeting in detail. Video and audio work together in NetMeeting and they are similar in many ways.

SAMSUNG EXHIBIT 1017, Page 165

Chapter 8

Application Sharing and File Transfer

In this chapter, you will learn:

- **How to set up and use application sharing**. NetMeeting's application sharing is probably its most useful business feature. This chapter will take you through every aspect of it.
- **How to use the shared clipboard**. NetMeeting gives everyone a single shared clipboard, which is probably one of the most obscure features it offers. However, if you understand what the shared clipboard does, it can be extremely useful.
- **How to send and receive files**. NetMeeting lets you easily send files to the other participants in a conference. Here's how to do it and how to avoid viruses and other problems.

Now that you've seen how NetMeeting works, it's time to put it to good use by collaborating on a project with someone else.

By using NetMeeting's application sharing, you can collaborate in real-time with one or more people over the Internet or your company's intranet. This allows you to work together on a Word document or another type of document, such as Excel or PowerPoint. You can even also use application sharing to show a colleague that hot new software you just bought.

SAMSUNG EXHIBIT 1017, Page 167

How often have you needed help modifying something on your computer? Before NetMeeting, you'd probably summon the office "computer guru" and ask him or her to help you out. Or maybe you would call a techie friend to help you change the IRQ setting on your sound card.

In both cases, you would either need to be in the same room with the person assisting you, or have to provide very specific and tedious descriptions of the problem over the phone. With NetMeeting, you can call up your expert friend and share applications, control panels, even the Explorer Window, which will allow your friend to look around the hard drive.

Your friend can troubleshoot, and likely even fix, your computer problems, all via the Internet—she might even be in another country thousands of miles away.

Or perhaps you work in a company with more than 50 people. Instead of walking to a different office to collaborate on a presentation with a coworker, you can just click on his name, connect with him, and share Word. Both of you will even be able to edit the Word document interactively. Not only will NetMeeting's application sharing save you the walk, drive, or flight to his office, but since you both are working on the same document, you won't need to take notes. In addition, you won't have to go back to your office, make changes, and then email the presentation to your friend for comments or additional changes. This is all because the changes are done in a live and interactive fashion. Once you integrate NetMeeting's application sharing into your work habits, you'll be rewarded with almost immediate paybacks. You'll save time. You'll work better as part of a team. The final work you and your team produce will be better too.

APPLICATION SHARING EXPLAINED

Now that I've told you what you can do with application sharing, it might be helpful for me to define exactly what application sharing is. Some of you might think that application sharing is the ability to share a program and data files on a file server. This is definitely the wrong notion as it applies to NetMeeting. First, there are two modes of operation for application sharing: view mode and collaboration mode.

View mode simply sends a copy of what is on your screen, concerning the application being shared, to the other members of the conference. Mouse movements are also transmitted. The application itself is not sent to the other person, only a copy of what it looks like on your screen. As you change what is in the application (like adding text in a Word document), those changes are sent to all participants in real-time. Put simply, NetMeeting sends all display changes that

SAMSUNG EXHIBIT 1017, Page 168

effect the application to the other members and it updates their screens as well. As I mentioned, mouse movements are also sent to the other participants so that they can see where your mouse is located on the screen of the application being shared. They will see a copy of your cursor with one change: your initials will be next to the cursor. Figure 8-1 shows the view, at a remote location, of a shared Word document. Note that my initials ("B.S.") are next to the cursor.

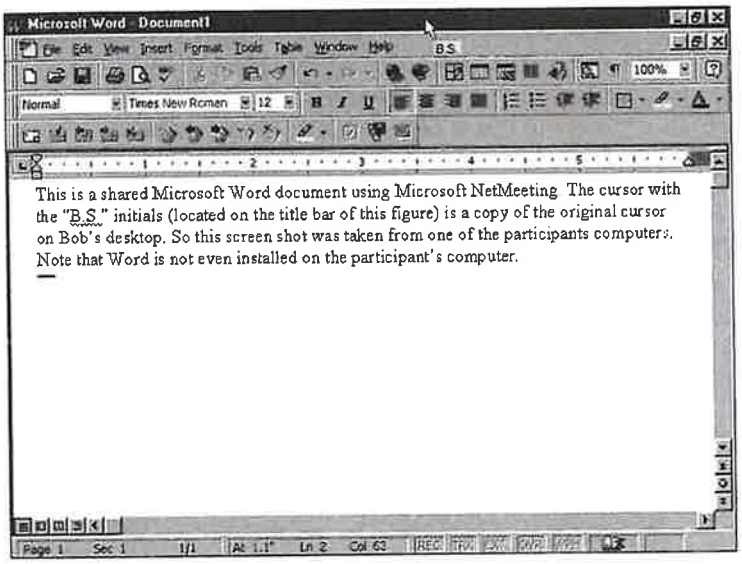


Figure 8-1. *Participant's view of a shared Microsoft Word document.*

In collaboration mode, members of the conference can actually take control of the application on your screen. This allows them to select functions of the application and make changes. The participants can add, delete, or modify text in your Word document. If you were to share your Control Panel, other users could examine any of its settings. Collaboration mode is the more advanced of the two modes.

You will have to determine the safety level of any application you are sharing. This is especially true when in collaboration mode. If there is information that you do not want others to see, then do not share any application that will show the sensitive information. If you have information that you do not want others to be able to modify or access, then do not enter collaboration mode with any application that could allow this. I will explore this in more detail in the collaboration section of this chapter.

The best way to understand application sharing is to work with it. So let's set up application sharing in a NetMeeting session.

SAMSUNG EXHIBIT 1017, Page 169

SETTING UP APPLICATION SHARING

It's quite easy to use application sharing with Windows 95. First you have to be in a NetMeeting session. After you are connected with someone (or in a group conference) simply open the application or window that you would like to share with the session participants. Then click the Share button (located on the NetMeeting toolbar and shown in Figure 8-2), and select the application or window that you want to share from the dropdown list. Voila, your app will be shared with everyone in the current NetMeeting session. Figure 8-2 shows that three applications are available for sharing: Paint, Microsoft Word, and the CD player application. I have highlighted the Word application.



Figure 8-2. *Press the Share button on the NetMeeting toolbar to share an application or window.*

Once you select the application to be shared, the dialog box shown in Figure 8-3 will be displayed. This message informs you that the other participants will only be able to view the application as you manipulate it. They will not have rights to change its contents until you turn on collaboration. Essentially, NetMeeting is telling you that the application has been shared in view mode. If you do not want to see this message again, select "Don't show this message to me again".

SAMSUNG EXHIBIT 1017, Page 170



Figure 8-3. *You must enable collaboration in order for others to control the shared application.*

If you're running Windows NT, you'll first need to update your system to Service Pack 3 or newer. Then you'll need to enable sharing, from the Tools menu, after you start NetMeeting for the first time, which will load the required software. These two steps will take about 30 to 60 minutes and must be done by someone with administrator privileges on your PC (most likely, that's the person who set up your NT machine). Make sure you back up your system before loading any Service Pack update—I've seen systems become troublesome after being updated.

You must be logged in as administrator to add application sharing because you are reducing NT's security when you turn on this feature. It is possible that your network administrator might not want you to use application sharing if your computer has sensitive documents on it. We'll cover security concerns a little later in the chapter.

Between 20 and 30 users can utilize application sharing at the same time in a group conference. Network configuration and the speed of each of the members' computers play a role in determining the maximum number of users. Efficient networks and fast computers will allow for more users in a group conference.

When you share applications with other users, your computer works harder to send out the information to multiple computers. Each computer that joins your NetMeeting will require additional bandwidth on the network. Therefore, your group will get the best performance if you share applications from the computer with the most bandwidth and processor power. When you share an application, you will notice a decrease in the performance of that application. If you are changing a Word document, you will notice that typing words and deleting text will be sluggish. This is because every change on the screen has to be sent to all participants of the conference. If you are planning to use application sharing in large groups, try to reduce your use of video and audio, so NetMeeting can dedicate

SAMSUNG EXHIBIT 1017, Page 171

more bandwidth to application sharing. The best advice I can give is to test this feature to see if your performance will be acceptable in a large group.

You can share almost any standard Windows application, but you'll have trouble with anything that draws fast-changing graphics or images on the screen like AVI files, some video games, or some CAD-type packages. The best way to find out is to simply try sharing the application and see how it works. Generally if applications require DirectX or ActiveMovie, they probably can't be used with application sharing.

Keep in mind that there is a small delay between the time you do something on the screen and when it shows up on the screens of the other participants. If you are doing a complicated series of steps and you want your partners to see what you are doing, you'll need to slow down a bit from your normal pace. It takes time to send the screen changes and mouse movements to all participants and then update their screens.

NetMeeting will remember all your mouse clicks and movements, so if you get ahead of the other screens, eventually they will catch up to you. This problem is compounded when using slower modems, especially if you are also using the audio, video, and other features in NetMeeting. If your partners say that the shared application is running very slowly, you might try turning off the video on a 28.8 modem (along with abstaining from using any other features of NetMeeting like file sharing).

What happens on the other side when you share an application? On the remote machine, a window opens up with a little extra tab that has your name on it (this lets your partner know that you shared this application). You'll also see the tab on your version of the application to remind you that it is currently being shared to all of the participants of the NetMeeting session.

As long as you've only shared the application in view mode and you haven't clicked the Collaborate icon, your partner(s) has no control over the application. She won't be able to move it around the screen, minimize it, or close it (unless she quits NetMeeting or hangs up on you). However, she will see your mouse movements when you are moving over the window that you have shared. If you minimize the application, it will also be minimized on every computer in the meeting.

There is no way to share the application with one specific person in a group meeting. So if you are in a conference that has two or more other participants and you share an application, everyone in the conference will see the application. If you decide to go into collaboration mode, then everyone in the conference can also control the application and make changes.

In order for everyone to see your shared application, it must be the topmost window on your screen. If anything is covering it, your partners will see an ugly dark area, as shown in Figure 8-4. To avoid this problem, minimize any other window and maximize the window or application that you are sharing.

SAMSUNG EXHIBIT 1017, Page 172

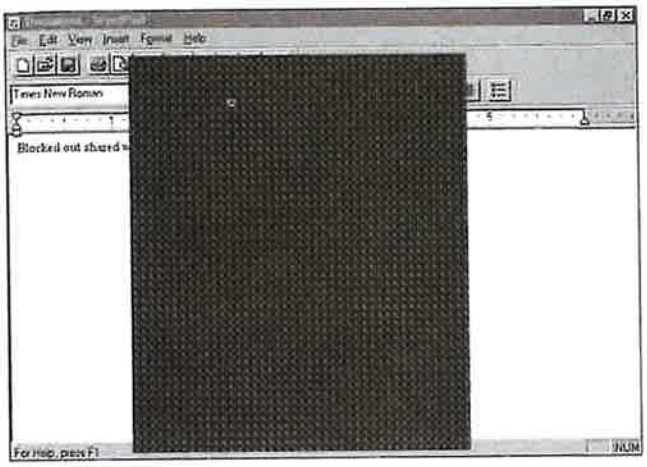


Figure 8-4. *A blocked out application. If you put a nonshared application window on top of a shared application, your partner will see weird results like this.*

Screen Resolution Differences

Application sharing works best when all participants use the same screen resolution and color depth. First, a brief explanation, since many NetMeeting users might not know that they can change the resolution or number of colors their screen uses.

If you right-click on your desktop and choose Properties, the Display Properties dialog will open. Click the Settings tab and you will be presented with the options to change the number of colors and display resolution (Figure 8-5). Most video display cards allow you to display images in 256 colors (8-bit), approximately 65,000 colors (16-bit or "High Color"), or 16.8 million colors (24-bit or "True Color"). All of the features of NetMeeting, including application sharing, will work best if your video display card is set to 16-bit or 24-bit. In 256 color mode (8-bit), images that are part of your applications will not look very good.

As far as desktop area (also commonly referred to as desktop resolution or screen resolution), Windows sets your screen to a default of 640 pixels across by 480 pixels down. Many people leave it there, partly because they don't know that they can change it to something else, and partly because they like large icons. With most video cards, you can go to 800 pixels across by 600 pixels down, or 1024 pixels across by 768 pixels down, or, if your monitor supports it, 1280 pixels across by 1024 down, or more. The higher you go, the smaller everything appears on the screen. I recommend the 800 x 600 setting because it will allow you to see more of your application and the text will not get too small. As you increase the resolution, the text will get smaller, so if you have vision problems, stay with the 640 x 480 setting.

SAMSUNG EXHIBIT 1017, Page 173

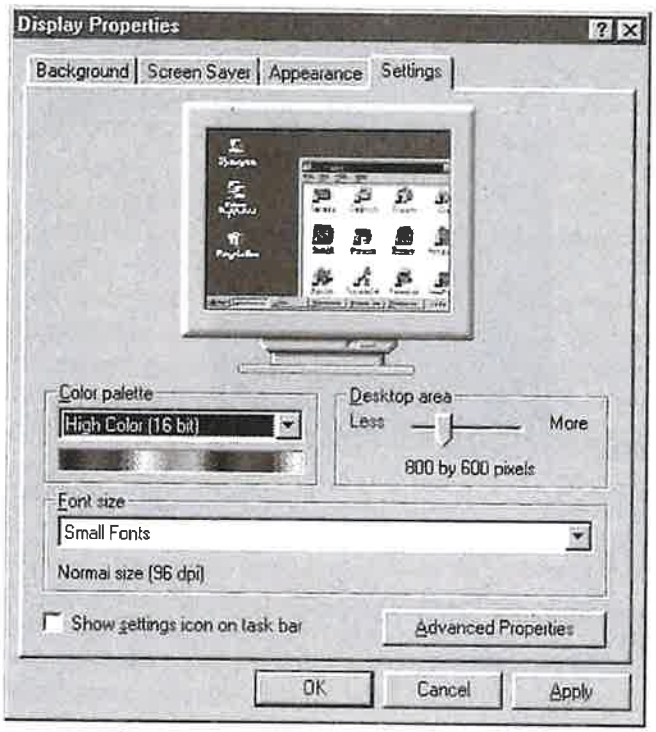


Figure 8-5. *It's best if everyone sharing an application uses the same desktop resolution and color depth.*

When you use NetMeeting to share an application from a screen set at, say, 800 x 600, and your partner has a screen set at 640 x 480, the application is still shared at 800 x 600. This causes a difference in screen resolutions between the originating screen and the other screens in the conference. In this situation, only a portion of the shared application will be displayed on the other participant's screen. In this example, only 640 x 480 of the 800 x 600 screen will be displayed at one time. What do I mean by one time? Well, NetMeeting gives the 640 x 480 user the ability to scroll to the portions of the application not displayed. In other words, NetMeeting creates a scrollable window view of the larger image. Figure 8-6 illustrates the disparity between two users who are sharing applications with different display resolutions.

Though NetMeeting does provide a method to see the entire application (a section at a time), it creates a lot of work for the members of the conference and it is entirely possible for them to miss something that you want them to see. It's better for all participants in a meeting to use the same resolution and palette color depth, but you aren't required to make every system exactly the same.

SAMSUNG EXHIBIT 1017, Page 174

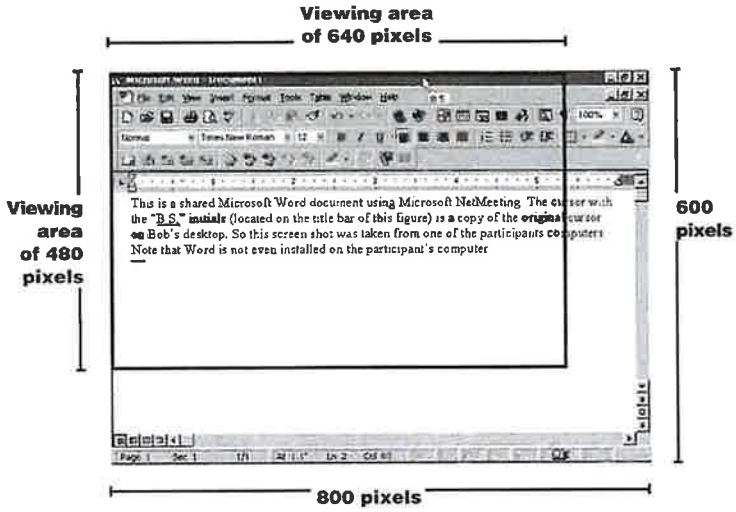


Figure 8-6. *The participant's viewing area is not large enough to see the entire shared application.*

Using a Phone Line While Sharing Applications

Sharing applications is extremely useful in groups, especially if you are giving presentations to coworkers in remote cities, or if you are working on a project with your boss, who's in one city on a business trip, and a coworker, who's in another city.

Unfortunately NetMeeting doesn't yet allow multipoint audio or video. But that doesn't mean you can't use your plain old telephone for a conference call (which is what you are doing now) between all three cities and then use NetMeeting for application sharing, and maybe Whiteboard and Chat. It is in this way that you can combine NetMeeting technology to enhance your current method of communication.

In fact, this is the best way to use NetMeeting for business, especially in the beginning stages. By using the phone to talk with members of a NetMeeting conference, you can turn off the audio features of NetMeeting. Turning off NetMeeting's audio will use decrease the processor power and network resources the program needs. If you decide to use NetMeeting solely for its data conferencing abilities, and not for voice data, make sure you turn off the microphone and playback systems (just unclick the check boxes next to the microphone and speaker icons on the audio toolbar of the NetMeeting interface).

As a consultant, I've found that it is best to start new NetMeeting users on the telephone before teaching them to use all of NetMeeting's features. Many

SAMSUNG EXHIBIT 1017, Page 175

people are frightened of using their computer in a new way, and it's far more comforting to use their telephone for audio at first.

There are really only two reasons to use NetMeeting's audio instead of placing a traditional phone call:

- It's easier to establish one connection instead of using both NetMeeting and making a phone call.
- It's less expensive, especially if making a long-distance call.

The audio quality and the number of services that are available through your plain old telephone are far better than what you can achieve with NetMeeting. This will change in the future, but for now you will find that it is incredibly valuable to use the phone for conference calls in combination with using the data conferencing features of NetMeeting.

WHEN TO COLLABORATE AND WHEN TO WORK ALONE

After you've shared an application or two, maybe you'd like to let your partner take control of your application and collaborate on a project. First, a word of caution. If you turn on collaboration, you are giving control of at least part of your machine to someone else.

That is a very dangerous thing, even if you know and trust the person you are collaborating with. It only takes one mistake to delete the file you are working on. Generally, people are pretty careful and honest when working on your hard drive, but it only takes one erased file to ruin your day. Therefore, make sure you never leave your computer while you are collaborating.

If you need to leave your computer for a minute, just turn off collaboration so the other people in your NetMeeting can't take control of your application. You can turn collaboration on and off simply by clicking the Collaborate button in the Current Call toolbar, or by using the Start/Stop Collaborate selection in the Tools menu. When you start collaboration, you'll see the dialog shown in Figure 8-7. This message informs you that you are turning on collaboration and warns you of the security issues that pertain to enabling this feature. You can choose not to see this dialog again by selecting the "Don't show me this message again" check box.

SAMSUNG EXHIBIT 1017, Page 176

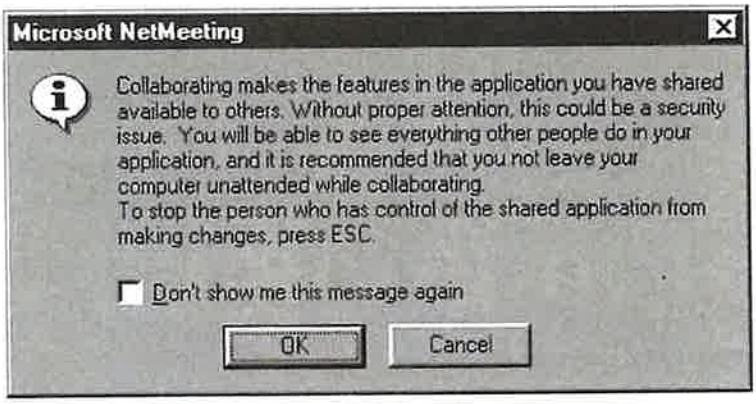


Figure 8-7. *Collaboration is being enabled in the NetMeeting session.*

You will find that collaboration requires more bandwidth than simply sharing an application. You might also prefer not to wrestle other NetMeeting participants for control of your mouse. What's that, you say?

Once you turn on collaboration, any participant in the meeting can take control of *your* mouse simply by double-clicking in your application's window on their screen. This can be very frustrating for a first-time user, so I recommend that you practice using application sharing before you get in a situation where you start swearing at your computer.

One feature I've found invaluable is the ability to regain control of the system by using the the Escape key (you know, the one marked Esc). If at any time you need to regain control of your system, just press the Esc key and NetMeeting will turn off collaboration. This is very useful if your partner is doing something to your application or system that you don't agree with (for instance, trying to format your hard drive). In addition to using the Esc key method, you can simply double-click on the screen to regain control of your own machine.

You will know when you're not in control of your own system because your mouse pointer will change from its usual shape to the initials of the person currently in control. When you are back in control, you'll be able to move your mouse again and the other person's initials will be gone.

Even when you are in control, the other participants can see your mouse pointer moving around their screens. They can also seize control of your machine again at any time under collaboration. If you have a large group in your NetMeeting conference, it can get pretty comical as everyone "fights" for control of your cursor.

SAMSUNG EXHIBIT 1017, Page 177

To avoid cursor fights, set up ground rules before you turn on collaboration. If the other participants get out of hand, use the Esc key method to turn off collaboration (since you probably won't be able to get control of your own mouse pointer for more than a few milliseconds in such a scenario).

Collaboration can be a frustrating technology if you've never used it before, so try it out with a coworker or friend in a nonthreatening situation before you use it in a stressful business situation.

EXPERIMENTING WITH APPLICATION SHARING

When you first try out application sharing, I suggest that you have fun with it. By sharing a game or sending email, you can learn about this NetMeeting function in a nonthreatening way and get used to what it does to your computer. Here are a few suggestions for sharing applications with new users.

Share a Game

How do you tell your friend about a new game you just bought? How can you easily convey the game's plot, or its great graphics, or anything else about it? The easiest way is to let your friend play the game. If it doesn't require fast movement, sharing the game will let your friend try it without having to buy a copy or going through the pain of downloading and installing a lot of files.

Games are some of the toughest applications for NetMeeting to share. But it all depends on the type of game. Sharing Solitaire will work fine, but any game that uses DirectX will not work. DirectX games usually have great 3-D graphics. Solitaire is a perfect example of an application that can help you learn about the ins and outs of application sharing. In fact, Solitaire is a great tool for teaching people about Windows in general. Try sharing Solitaire with a friend or colleague and then turn on collaboration. The knowledge gained from playing a friendly game of shared Solitaire will come in handy if you ever use NetMeeting to share a PowerPoint presentation with an important audience or share a Word document with your colleagues. Figure 8-8 shows a shared game of Solitaire. Notice the tab in the top right corner of the application indicates "shared by Bob Summers." As mentioned earlier in the chapter, this tab reminds us that the application is currently being shared.

SAMSUNG EXHIBIT 1017, Page 178

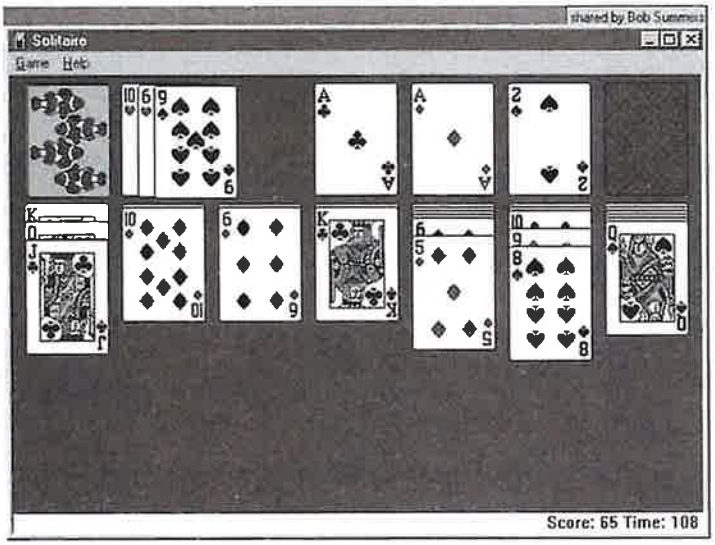


Figure 8-8. *By sharing a game of Solitaire, you can learn a lot about the behavior of NetMeeting's application sharing.*

One amusing use of application sharing is to let your friends send email to themselves. To do this, just open up Exchange (or your favorite email editor) and share it. When they open a new mail message, address it to themselves, and send it, they might think the email is being sent from their computer (application sharing can often "fake out" your partners into believing they are actually working with their own applications on their own computers).

Make sure your partner doesn't send a nasty letter to your boss, though. It will have your return address on it since it was sent from your machine. I use this as an example for application sharing because it demonstrates two concepts:

- The application being shared is actually on the shared computer, and not on the receiving computer.
- If you share the wrong kind of application with the wrong kind of person, you leave yourself open to large security risks.

The lesson to be learned by sharing an email application: always watch your partner, and hit the Esc key if he or she starts doing something that could get you in trouble.

SAMSUNG EXHIBIT 1017, Page 179

Share Your Explorer Window

If you want to give your partner complete access to your hard drive, you'll want to share an Explorer window (see Figure 8-9).

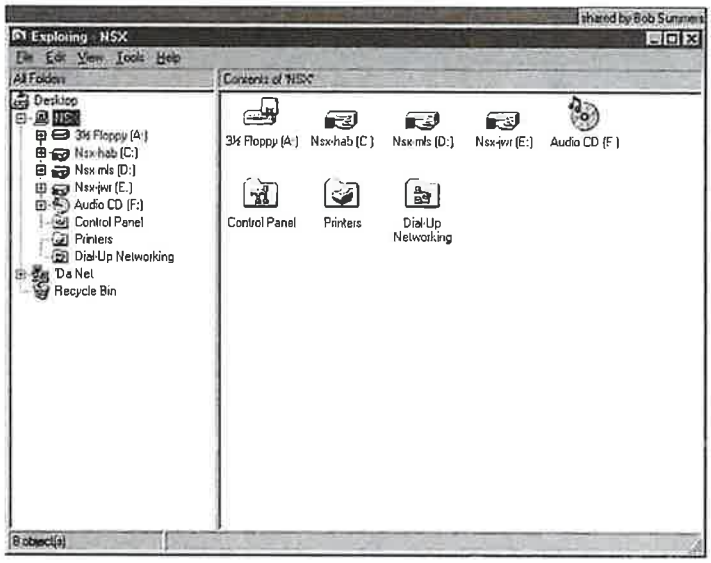


Figure 8-9. *By sharing your My Computer window, or any Explorer view like this one, you can give your partner full access to your hard drive. Be careful, though, it's very easy for your partner to erase and access files.*

An Explorer window is the window that comes up when you double-click on My Computer. This view is very useful, especially if you have a little knowledge about your hard drive and how to access files and open programs.

For instance, if your friend shares his Explorer window with you and you want to see the files on his desktop, just navigate to his C:\WINDOWS\DESKTOP folder. Every file you see inside that folder is on his desktop.

What's really surprising is that if you double-click any of these files, they will open the proper application and that will be shared too! In other words, by simply sharing one window, you've shared *all* the applications on your hard drive. This is very powerful, especially if you are trying to help someone solve a problem on their computer.

You can even start up control panels—just switch to the Control Panels folder and open them up. You'll notice that each one that is opened automatically gets shared.

SAMSUNG EXHIBIT 1017, Page 180

Looking for an application that has a shortcut in your partner's Start menu? Just navigate to C:\WINDOWS\START MENU (using NT4, things are in different places, for instance, the Start Menu is under C:\WINNT\PROFILES\ADMINISTRATOR\START MENU\). Remember, sometimes the boot directory (usually C:\WINDOWS OR C:\WINNT) is on a different drive or has a different name, so you might have to look around for a few seconds to figure it out.

Be wary of using this application sharing technique with strangers, though. Your partners can very easily erase folders (or even your whole drive) if they have access to your system through a shared Explorer window. Always be prepared to hit the Esc key if anyone moves folders or deletes files they shouldn't touch.

Collaborating on a Word Document

Many of us will use NetMeeting's application sharing feature to share a Word document with a group of people on a conference call, or to collaborate with a coworker or client. I am sure you can think of several documents that you are always working on with a group—perhaps it is the latest specification for a new product or a summary of the previous quarter's sales. If someone that you work with is located in a different building, or even a different state or country, you are accustomed to sending these documents via email and discussing them on the phone. And you have certainly found that sometimes the required changes don't get implemented perfectly.

Using NetMeeting to share a Word document will eliminate this problem because everyone in the conference can interactively make changes to the document and see the results immediately. You won't have to wait to get the latest changes via email because you will have the changes as they are discussed. Sharing a Word document is done in exactly the same manner that we shared Solitaire and Windows Explorer.

Connect all of the needed people into a NetMeeting conference and start Microsoft Word. (Chapter 9 discusses hosting a group conference.) Load the appropriate document into Word and tell NetMeeting to share the Word application. If you want the other members to be able to make changes, turn on collaboration. It may not be necessary to enable collaboration to get the job done. In fact, it may be more efficient for one person to make the changes while everyone in the conference makes suggestions and watches the changes being made.

Most computer users are familiar with Microsoft Word or at least word processing, so using NetMeeting to share this type of application will be a good first step to introduce the power of collaborative conferencing with NetMeeting. Another good practice is to share your Web Browser. Collaborative Web browsing can be a good way for people to see the interaction of filling out Web forms or using any other Web application.

SAMSUNG EXHIBIT 1017, Page 181

Extending NetMeeting's Application Sharing with Other Products

There are several products on the market that can help your company more fully use NetMeeting's application sharing features. Here is a rundown of some that might be interesting to you or your network administrator:

- PictureTel has built NetMeeting interoperability features into its existing products so NetMeeting users will be able to use applications shared from PictureTel's LiveLAN line.

  `http://www.picturetel.com`

- Data Connection Limited has developed a product called DC-Share that lets Unix users share applications with NetMeeting users.

  `http://www.datacon.co.uk`

- DataBeam offers its neT.120 Conference Server, which lets you host multipoint conferences on the Internet that use Web browsers and Web servers for high-performance application sharing.

  `http://www.databeam.com`

- OutReach Technologies has a product called CONFERease, which simplifies application sharing by integrating it into your company's intranet.

  `http://www.outreach.com`

SHARING THE CLIPBOARD

Along with application sharing, NetMeeting introduces another very powerful concept—the shared clipboard.

For those of you who haven't used cut and paste features yet, the clipboard is where your computer stores data that is copied or cut (using the Edit/Copy or Edit/Cut menu selections). The clipboard can hold words, documents, pictures, objects—just about anything that can be displayed on the screen.

Usually you can only paste items that are on your own computer's clipboard. However, NetMeeting combines the clipboard of everyone who is in a meeting into one shared clipboard.

This is one of the more obscure features of NetMeeting, but it's extremely useful. For instance, let's say you are on a unique Web page and you want to share it with other people. Sure, you could type the URL into the Chat area, but, as mentioned in Chapter 5, it isn't very easy to get text out of the Chat area and into your Web browser.

SAMSUNG EXHIBIT 1017, Page 182

Better yet, why not highlight the URL and copy it (Ctrl + C). Then tell everyone to highlight the URL address that's currently in their Web browser's address line and press Ctrl + V or go to the Edit menu and select Paste. After hitting the prerequisite Enter to tell the Web browser that something new was placed in the address line, your partners should now be surfing to the same Web site you are looking at.

This technique is great for passing pictures, or letting people use the same clip art on their documents as you have on yours, and it'll save you the steps of pasting data into the Whiteboard to transfer it.

Also, some things, like music, can't be placed on the Whiteboard, so copying them to memory and then letting your friends paste them into documents is more useful.

FILE TRANSFER

Sending files from one computer to another using NetMeeting is a straightforward process. Most people send files to their colleagues as a file attachment to email. This is a great way to send files electronically, but there are certainly times during a NetMeeting session when you will find it easier to use the built-in file transfer functions rather than running your email program. If you are giving a presentation on the market growth of your company's newest widget, and you realize that the widget specification sheets would be useful to everyone, then sending them with the File Transfer feature is certainly a good way of accomplishing that.

Starting a file transfer is accomplished by clicking the Tools menu and selecting File Transfer. There are four additional menu items under File Transfer: Send File, Cancel Send, Cancel Receive, and Open Received Files Folder. Choose Send File (or Ctrl + T) to start the transmission of a file from your computer to the other members of your conference. You can select Cancel Send to stop the transfer and Cancel Receive to stop a file that you are receiving. When you select Send File, you will be asked to select the file that you want shown (Figure 8-10). In the example, NM21.EXE (NetMeeting version 2.1) is being sent to the other user.

Once you select the file, it will automatically be transferred to the other people in the conference. All receivers are presented with a dialog window showing the progress of the transmission (Figure 8-11). On this dialog, you can choose to Accept or Delete the transferred file. If you select Accept, then the dialog will disappear and the file will be accepted in the background. A status bar on the bottom of the NetMeeting user interface will show the progress of the transmission.

SAMSUNG EXHIBIT 1017, Page 183

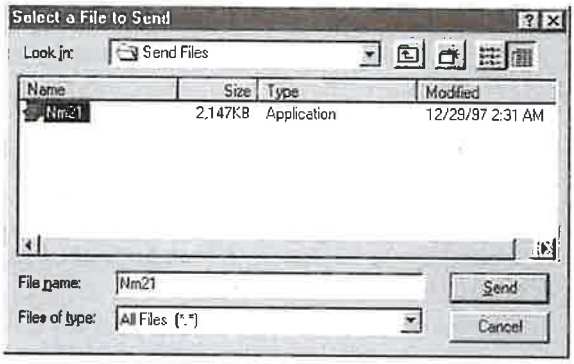


Figure 8-10. *Selecting the file to send.*

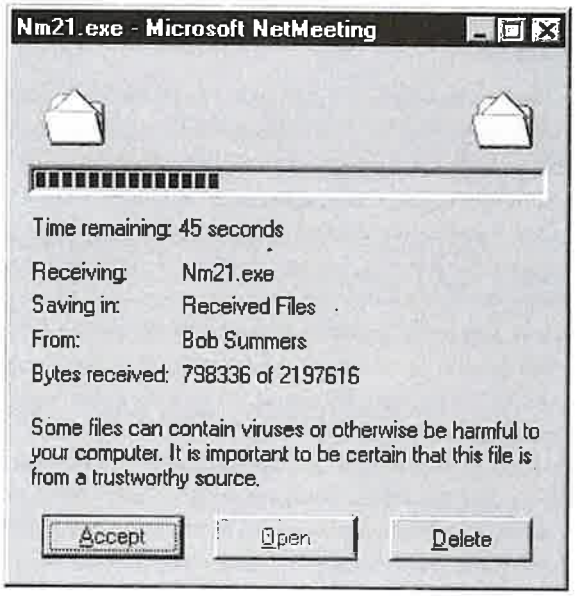


Figure 8-11. *Receiving status of the file transfer.*

Both the sender and receiver can cancel the transmission of the file by the File Transfer area of the Options menu. If the file is transmitted successfully then the message shown in Figure 8-12 is displayed on the sender's side. If the receiver cancels the transmission, the sender will get the message shown in Figure 8-13.

When the sender cancels the file transmission, the status window on the receiver's side will look like Figure 8-14.

SAMSUNG EXHIBIT 1017, Page 184



Figure 8-12. *The file was sent successfully sent.*

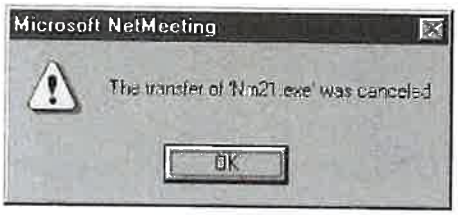


Figure 8-13. *File transmission canceled by the receiver.*

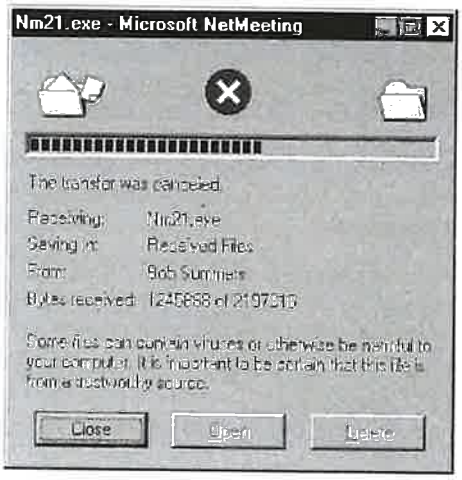


Figure 8-14. *File transmission canceled by the sender.*

The only configuration option for the File Transfer feature is where to place received files. This is found on the General tab of the NetMeeting Options dialog, as shown in Figure 8-15.

SAMSUNG EXHIBIT 1017, Page 185

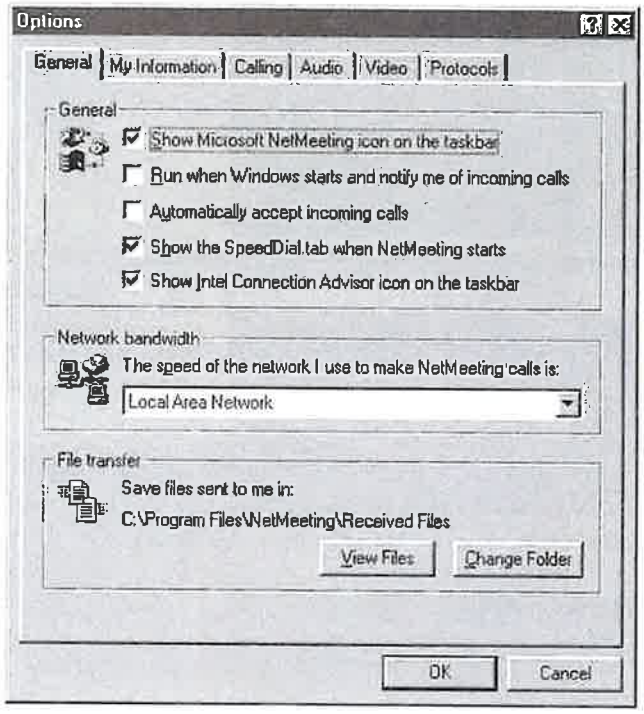


Figure 8-15. *Setting the location of received files.*

Applications of File Transfer

Let's say you just finished working on a PowerPoint presentation with your boss and you'd like to give him a copy of the completed presentation. How do you get it to him? Well, you could email it, or you could put it on a server and tell him where to find it. However, why not just send it to him using NetMeeting while you're still connected in the conference?

It's very easy to do, and the same file will go to all the participants in the meeting. To send a file, you just choose File Transfer in the Tools menu. You'll be prompted to find the file that you want to send to everyone.

On the other end, the receiving parties will be able to decide whether they want to receive the file or not, and once they accept it, they'll be able to go to the folder in which NetMeeting saves the file and open it up.

That might be the end of it, but accepting files on the Internet, especially from people you don't know, can be hazardous. First of all, your partner's computer may be infected by viruses (most of the time people who have viruses don't even know they have them). In addition, most people compress their files before they send them over the Internet, and some people even encrypt the files

SAMSUNG EXHIBIT 1017, Page 186

before sending them. Compressed and encrypted files can't be used until you uncompress or unencrypt them.

Compressing Files

Uncompressing Windows-based files is fairly easy. You just need an "unzipping" program (the program that is commonly used to compress files on Windows-based computers is called PKZIP or a compatible program). I like WINZIP, available from http://www.winzip.com. WINZIP makes it easy to uncompress files because you can just double-click on the file to open it. I also recommend WINZIP because some zipped files have folders saved inside of them, and WINZIP always uncompresses those files properly and keeps the folders intact. If you use standard old PKUNZIP from the command line, you'll need to remember to type in the "-d" parameter so that files are put into their proper folders.

Receiving files from Macintosh and Unix users is a little more difficult because they don't use PKZIP (usually). Most of the time Mac users employ something called StuffIt. We won't get into that subject here, there are other books that cover file compression and decompression between platforms.

Making Sure Files Are Virus-Free

I can't state this strongly enough: if you don't have a virus-detection program, like Norton AntiVirus from Symantec or McAfee's Virus Scan program, then you should not accept shared files. I'll leave the operation of these programs to their manuals, but you should set these programs to automatically scan downloaded files.

Make sure you scan every file you receive for viruses before opening it up. Every virus I've received I've gotten from friends. I also don't accept files from people I don't know. This may sound like overkill, but one virus can ruin your day (some of the worst viruses can erase or destroy your hard drives!).

Make sure you always keep your virus program up to date. Most of the modern antivirus programs have automatic Internet update capabilities, and they usually have "patch" files on their Web sites to find the latest and worst viruses.

Encryption

What happens if you want to send a file to only one person, but there are 10 people currently in your NetMeeting conference? You could encrypt your file and only give the "key" to the person who you want to see your file. There may be other situations when you want to ensure the security and privacy of a file transmission.

Using encryption is fairly easy, you just need a tool to encrypt the file and to unencrypt files you have already received. The most popular of these tools is called PGPfreeware, from Pretty Good Privacy, Inc. at http://www.pgp.com.

SAMSUNG EXHIBIT 1017, Page 187

FROM HERE...

This chapter wraps up our exploration of NetMeeting's features.

The next few chapters focus on using NetMeeting in a corporate environment:

- Chapter 9, "Hosting a Group Conference," shows how to get the most out of NetMeeting in a group context.
- Chapter 10, "Considering Security," details how to safely use NetMeeting in a professional arena.
- Chapter 13, "Setting Up Your Own NetMeeting Place," talks about how to integrate NetMeeting into your corporate world as more than just a replacement for the telephone.

SAMSUNG EXHIBIT 1017, Page 188

Part III

NetMeeting in the Business World



Chapter 9

Hosting a Group Conference

In this chapter, you will learn:

- **How NetMeeting's multiparty meeting capabilities work**. NetMeeting can be used either in decentralized mode, in which each machine is hooked up directly to every other machine in the conference, or in a centralized server mode, in which each machine hooks up to a central server. You'll see the advantages of both.
- **What NetMeeting can and can't do in multiparty meetings**. In its native decentralized mode, NetMeeting can't provide audio and video to all participants, but it can offer data conferencing capabilities including use of Whiteboard, Chat, application sharing, and file transfer.
- **How to plan a multiparty meeting**. Multiparty meetings need more forethought than a standard NetMeeting call. This chapter offers some suggestions to help you along in your planning.
- **How to host your own multiparty meeting**. Setup your own multiparty meeting, and see how the various ways to connect groups may affect your meeting.

SAMSUNG EXHIBIT 1017, Page 191

NetMeeting is useful for calling a single partner, but it really gets its name from the ability to allow you to host and participate in meetings with other people. This chapter covers how to host a meeting and how to notify people that a meeting will be held. We'll also look at NetMeeting's limitations concerning multiuser meetings, and how you can overcome those limitations with third-party products.

UNDERSTANDING MULTIPOINT CONFERENCING

A multipoint conference is simply a conference with more than one other person. NetMeeting supports an unlimited number of participants in a multipoint conference. Even though NetMeeting will support an unlimited number of participants, you should be aware that performance of the conference does decrease dramatically when there are more than 20 users in a conference.

If you use NetMeeting in its default meeting mode, it sends duplicate TCP/IP packets from one computer to all the computers connected to it. This is important to understand, because the more computers there are to send packets to, the slower the performance of all connected computers. Also, how you started a NetMeeting affects how participants can disconnect from the meeting. If you are only planning to have three or four people in a meeting, then you don't need to worry too much. But if you have 30 friends from your social club or 20 coworkers meeting to talk about next year's budget, then you'll need to put a little more thought into the process.

The Two Models of Multipoint Conferencing

There are two common models for multipoint conferencing and NetMeeting is set up to support both of them. One is the decentralized model (which is how NetMeeting normally works), and the other is a centralized model. Decentralized multipoint conferences require one of the participants to act as the Multipoint Controller (MC). With NetMeeting, the person who is hosting the conference performs the duties as MC. This happens automatically. In the centralized model, each person connects to a central Multipoint Control Unit (MCU).

The centralized model is more scalable (in other words, offers better performance) because the MCU can be a very fast machine located on a network with a large amount of bandwidth. Each machine connected in a centralized model only makes one connection to the MCU. However, in the decentralized model, those machines must connect to every participant in the meeting.

SAMSUNG EXHIBIT 1017, Page 192

Let's take a three-computer meeting as an example. (See Figures 9-1 and 9-2.) In the decentralized model, computers B and C call computer A, which is acting as the MC. If another computer, D, were to connect to the conference, then it would have to make a connection to A, B, and C.

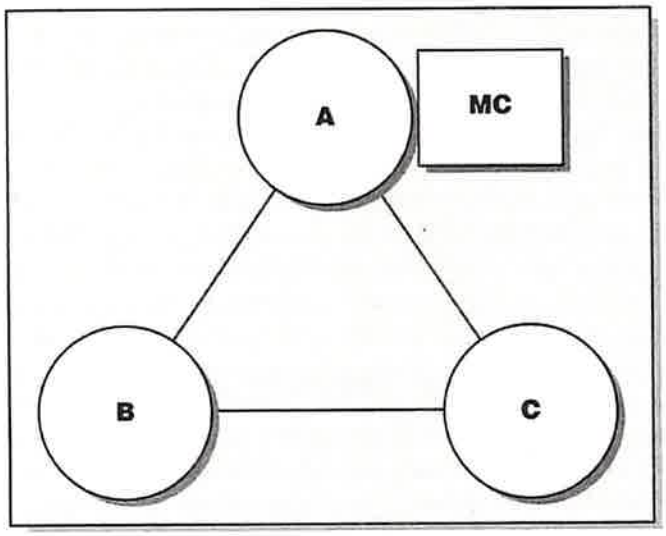


Figure 9-1. *Relationships between computers in a decentralized multipoint conference.*

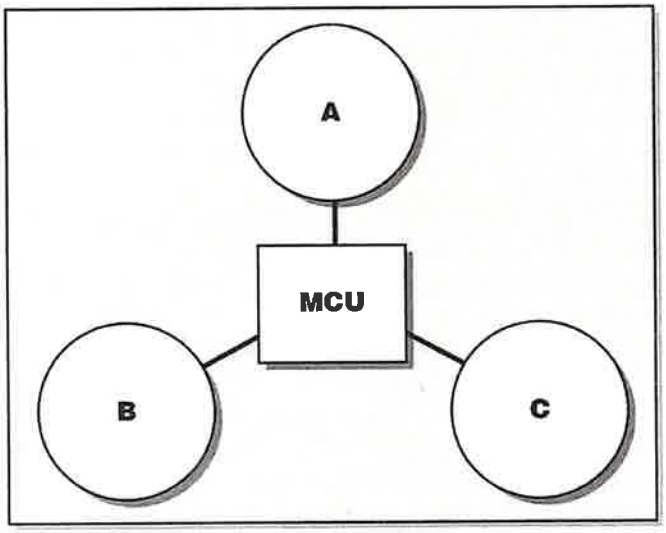


Figure 9-2. *Multipoint conferences in a centralized model are more scalable.*

SAMSUNG EXHIBIT 1017, Page 193

Using the decentralized model takes "n+1" bandwidth on each machine, which means that each machine added to the meeting will force all the other machines to use more bandwidth. If each machine in a meeting is using 10 Kbps of bandwidth, then the addition of a fourth machine will force each machine in a meeting to use 40 Kbps instead of 30 Kbps.

A great (and fun) example of centralized model conferencing is OnLive's ACS 300 software, which lets multiple people send and receive audio on a 28.8 Kbps modem. In fact, OnLive and White Pine are two of the companies that have announced a multipoint conferencing server to support NetMeeting clients. You can find OnLive at http://www.onlive.com and White Pine at http://www.wpine.com. OnLive's servers are on high-bandwidth digital connections to the Internet, and the software they use runs on the latest high-speed server class machines. We'll cover these and other servers later in this chapter, when we talk about products that extend NetMeeting's multipoint capabilities.

You can see that there are some significant technical challenges to conducting group meetings, especially in the decentralized model. This is probably why Microsoft didn't include audio and video features in NetMeeting's decentralized meeting capabilities. (NetMeeting is capable of multipoint audio and video if you move to a centralized model, but that requires an expensive "extra" machine that does nothing but combine all the streams and keep track of each participant.)

The Limitations of Decentralized Meetings

Forget for a moment that you can use NetMeeting with a centralized server, because most people and businesses won't have access to MCU machines or specialized audio and video servers. I'll briefly cover these conferencing servers later on, but they are expensive (up to $50,000), and difficult to set up and maintain, so I doubt most NetMeeting users will have a centralized server machine any time soon.

Using NetMeeting on a TCP/IP-based network (like the Internet), you can get at least 20 people together in one meeting. Microsoft has actually tested NetMeeting with groups larger than 20 people, but the quality declines and you need faster machines and more bandwidth to support additional users (because of the "n+1" effect on each connection when you add an additional machine).

Using NetMeeting's Chat feature, you'll be able to type messages to everyone at large, or just a specific person out of the group (and they'll be able to type back to you). You can share an application with everyone in the group (although only a total of three applications can be shared at one time). You can draw, paste pictures, or type in the Whiteboard at the same time as anyone else. You can also send files to every person in the meeting.

SAMSUNG EXHIBIT 1017, Page 194

However, there are several limitations to using NetMeeting in groups. First, you won't be able to use audio or video features with more than one other person without the use of a multipoint conferencing server. Second, as more people join your meeting, you might notice a slowdown in the performance of your shared applications, file transfers, and Whiteboard. I'll tell you how to plan your meeting so that you can minimize the performance slowdowns in the following section.

Third, because of how NetMeeting connects users, you might have trouble if someone wants to leave the meeting. NetMeeting builds its connections like a tree with different branches. If one of the first participants (a major limb) wants to leave, he'll take everyone who connected to him (smaller branches and leaves) out of the meeting whether they want to leave or not. That's why NetMeeting has a "Host Meeting" feature—which lets everyone connect directly to one machine—for those who plan to stay for the entire meeting. This brings us to the subject of planning a meeting.

PLANNING A MULTIPOINT MEETING

Planning a meeting will help you get around some, or maybe all, of NetMeeting's limitations. First, you might want to write down your expectations for the meeting. Do you need video between all participants? What about audio? What is your budget for setting up this meeting? How fast do you need the various NetMeeting features, like the Whiteboard and application sharing to work? Who will take control of a shared application? How many people will be in the meeting? Will the meeting be held at a specific time? How will participants know that there's a meeting? Will certain groups come and go during the meeting? Will everyone have access to a conference-enabled telephone system? Will the meeting be open to public participation? What is the connection speed of all the participants? It's helpful to answer these questions before you proceed.

For instance, if you need to have video among all participants, it's likely that you won't be able to use NetMeeting because the standard version doesn't offer video between more than any two participants without an additional multipoint video server.

It's important to know your expecations, your budget, and how many people will need to be served in your meeting. If you expect to have the same experience with 32 people as you have with only 2, then you'll probably need to get some of the third-party servers, like the one from DataBeam, which accelerates group Whiteboarding. These servers and the software that runs on them cost money and will probably take some of your MIS department's time, so you'll need to figure that into your budgets.

Knowing whether certain groups need to leave or join, or whether the public will be asked to participate, will affect your planning and how you notify everyone of your meeting.

SAMSUNG EXHIBIT 1017, Page 195

Notifying Users of a Conference

First you'll need to notify people that a meeting is taking place and their attendance is requested. It would be great if you could make it easy for participants to join a meeting, instead of forcing them to figure out your IP address, or worse, find your name in an ILS directory. There are several ways to make it easy for people to join a meeting:

- Put a "callto" link on your intranet or Internet Web page. This is useful when you have a regular meeting that everyone already knows about, say, a meeting of your local genealogy club that assembles online the first Tuesday of every month at 8:30 PM. That way your friends can simply go to your Web page and click on a link, which connects them to the meeting.
- Build a SpeedDial "shortcut" and put it in a convenient location. This is useful on a LAN, where you can tell your coworkers that they can join a meeting by double-clicking a shortcut in a specific folder.
- The new version of Microsoft Outlook 98 enables you to schedule a meeting as an online meeting, easily allowing the invitees to connect using NetMeeting.

Whichever way you invite people to join your meeting, make sure you do it far enough in advance so that everyone can attend. I also recommend including some other means for them to contact you, like your phone number, your IP address (if it doesn't change), and your email address (make sure to check your email often just before your meeting). Sometimes things go wrong, and it's impossible to connect, so if you give your participants your contact numbers, they'll be able to call you and let you know what's going wrong or why they aren't in the meeting.

Alternatives to NetMeeting for Multipoint Audio

Since multipoint audio is not native to NetMeeting, several companies have found it best to use NetMeeting for its Whiteboard or application sharing features, and then use a PBX-based telephone system to connect everyone via a phone line conference call. Users calling from home should be able to use this, but it will mean getting a second phone line (one for the modem, one for the telephone).

In fact, many companies use NetMeeting in conjunction with a standard old telephone anyway, because NetMeeting audio is often delayed a half second or more. Turning off NetMeeting's audio will conserve bandwidth for using the other features of NetMeeting, as mentioned in Chapter 8.

SAMSUNG EXHIBIT 1017, Page 196

OnLive has an H.323 compatible multipoint audio server called the Onlive! ACS 300 that is compatible with NetMeeting. OnLive lets up to about 100 people enter a virtual room and talk with each other, just as if they were in a conference room. This technology works, even if everyone is on a 28.8 modem, because it uses a centralized server that collects the audio information from everyone. It combines this information into one outgoing stream that is sent to all the participating parties. Of course, the server needs an expensive T1 line (and the server software from OnLive isn't something that everyone can afford either). However, if your company definitely needs to use NetMeeting to hold multiparty meetings, OnLive is something to consider.

Getting the Best Performance from NetMeeting

When planning a multiparty meeting, it pays to understand how NetMeeting works. Machines in a meeting serve up to three purposes (some machines can do all three, but most machines only send and receive data):

- They are "receivers" of data.
- They are "senders" of data.
- They are "controllers" of the connection.

If you want the best performance for everyone in the meeting, I recommend you use your fastest computers for sending tasks like application sharing or file transfer. When I say fastest computers, I mean the ones that have the fastest processor *and* the most bandwidth; bandwidth is actually the most important consideration. This is especially true for the host machine or MCU server.

Why is this? As mentioned at the beginning of this chapter, in the decentralized model, computers need to send a different packet of data to each connected computer. So, if there are five computers, with one doing application sharing, that sharing computer is actually sending out each piece of information four times. This will change over the next year as the networks and NetMeeting itself gets upgraded to use something called "multicast." But for now each computer has to do a lot of work, especially if there are dozens of computers in a meeting. If you share an application from a slow 486 and everyone else is using Pentium 200 machines, you'll penalize the entire group.

Likewise, if three out of the four people have ISDN modems, and the fourth has a 28.8 modem, it would penalize the group to do application sharing from the 28.8 modem-equipped system, since the ISDN systems pass along more than four times the amount of data.

Controlling machines should start the meeting (more about that in the next section). These also should be the fastest machines with the most bandwidth,

SAMSUNG EXHIBIT 1017, Page 197

because they pass packets back and forth to the other computers in the group and act as little servers.

HOSTING A MEETING

There are a number of ways that you can start a multipoint meeting in NetMeeting:

- **The "everyone call here at 2:00 PM" technique**. Tell your NetMeeting friends to call your IP address, or find you in a specific ILS server, at a specific time. This is useful with groups of informal friends, or spontaneous meetings, especially if you have a static IP address (an IP address that doesn't change).
- **The "host a meeting" technique**. Very similar to the above technique, except that the first person actually sets up a meeting by using the Host Meeting command in the Call menu. This is the recommended way to host a meeting. Just remember that the host should have the fastest computer and the most bandwidth. Other participants of the meeting would then connect to the host at the desired time.
- **The "call a gateway" technique**. If your company has purchased one of the conferencing servers or MCUs, you'll be able to call a meeting using a specific name or IP address. Your MIS department will give you more information on this.
- **The "bring a meeting to a new place" technique**. I've seen this happen a few times. If there are two separate meetings going on with, say, four people each, and one person in the first meeting calls someone else in the second meeting, the two meetings will be merged into a larger meeting of eight people. However, if any of the two "connection makers" hangs up, then the two groups will be split back up into their original four and four configuration.
- **The "invite someone in" technique**. This is how many meetings grow, especially on the Internet. Two people may be talking and agree to " invite Bob in," which results in a meeting with three people. Bob can then invite John and John can invite Ben.This is fun, but be careful—if, all of a sudden, the person who invited Bob into the meeting has to leave (or his computer crashes), then all of the participants who came in afterward will be disconnected.

SAMSUNG EXHIBIT 1017, Page 198

- **The "meeting by chance" technique**. This is also common on the Internet, and it will become more common as more people discover NetMeeting. For instance, Bob answers a NetMeeting call from Jane. As they talk, someone named Jim calls (out of the blue, because both people are listed on the ILS). In this case, Jane would be asked whether or not to accept the call. If she accepts, they'll have a chance meeting of three people. This has the same disadvantage of the "invite someone in" meeting. (If Jane hangs up, Jim is disconnected from Bob, even if he didn't want to be. Note though that Jane will get a message saying other people will be disconnected if she exits NetMeeting).

The best and safest way to host a meeting is to use the "Host a Meeting" technique, because it allows anyone to hook up or leave at any time. To host a meeting, select Host Meeting from the Call menu on the NetMeeting interface. When you start to host a meeting, the dialog shown in Figure 9-3 will be displayed. This message simply informs you that you are hosting a meeting that others can join. By using this method you can select the fastest machine ahead of time to ensure that machine will be the main connection point for best performance. Hosting a meeting also gives you control over who can participate in a meeting.



Figure 9-3. *Hosting a meeting gives you the most control over a multiparty meeting.*

Removing People from a Meeting

If you are holding open public meetings, you'll occasionally be burdened with a person who is disturbing the other participants and will need to be removed from the meeting. If you hosted the meeting, it's really easy to kick someone out. Just click the Current Call icon in NetMeeting's main window, then right-click the name of the person you are trying to boot. A pop-up menu will appear (Figure 9-4). Choose Remove from Meeting.

SAMSUNG EXHIBIT 1017, Page 199

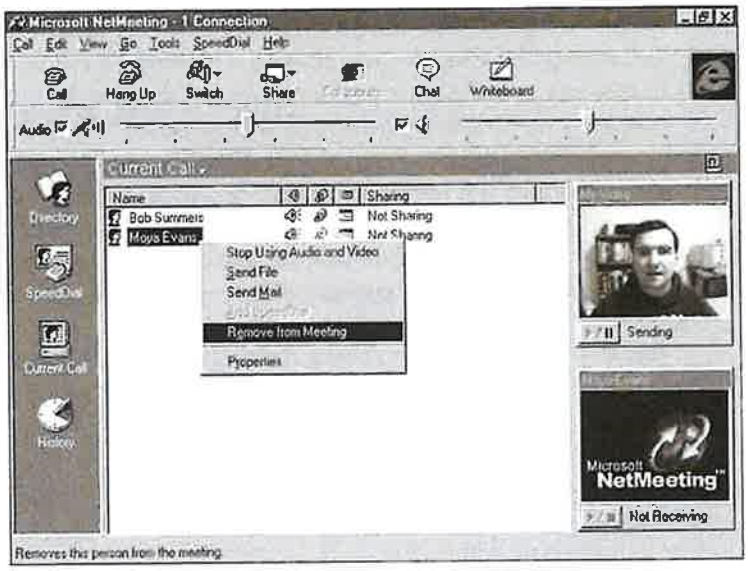


Figure 9-4. *You can remove a person from a meeting by right-clicking on his or her name.*

Audio and Video in Multipoint Meetings

I've already explained that NetMeeting doesn't let you see or hear multiple people, unless you are connected to a conference server or an MCU. But that doesn't mean you can't use audio or video between two people at all in a multipoint meeting. In fact, NetMeeting includes a feature that lets you switch to any other member and use the audio and video features with that specific person. This feature is enabled by clicking the Switch button in the NetMeeting window and selecting the name of the person that you would like to switch to.

NetMeeting lets anyone in a multipoint meeting "pair up" and talk to another person who isn't already using audio or video features with someone else. That's where the icons in the Current Call pane come into play—they tell you who is already using audio or video features and who isn't. Figure 9-5 shows three different types of audio and video icons:

- **Grayed out icons**. These icons show that this person is not using audio or video at this time. You can switch your audio and video features to these people at any time.
- **Grayed out icons with a red star**. These icons indicate that certain people are currently using audio and video features, so you will not

SAMSUNG EXHIBIT 1017, Page 200

be able to switch audio and video to them.

- **Full-color icons**. If you see a full-color icon, it means that you are currently using your audio and video features with someone else (who will have the same icons as you do). The only options are to either switch your audio and video features to someone else, or turn them off completely.

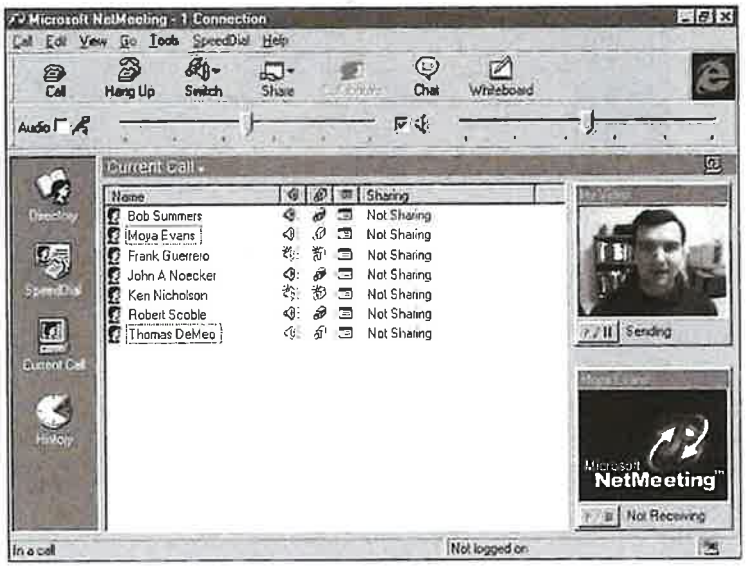


Figure 9-5. *Current Call icons show you who is in an audio or video call and who isn't.*

Switching Audio and Video Between Users

Switching audio and video is as simple as clicking the Switch icon on NetMeeting's main window and choosing the name of the person you'd like to use audio and video with (see Figure 9-6). You can also choose to completely switch off the audio and video features by selecting the name of someone that you are already using these features with and clicking the Switch icon.

You might notice that there are some names you can't switch to because they aren't listed on your Switch list. You can only switch to a user who is listed in the same "tree branch" as you are. In other words, you must be connected to the same computer. People who connect to computer A won't be able to switch their audio and video to people who are connected to computer B. The best way around this limitation is for everyone to connect to the same computer.

SAMSUNG EXHIBIT 1017, Page 201



Figure 9-6. *In a multiparty meeting, use the Switch icon to choose which person you'd like to use audio or video features with.*

Sharing Applications

You can share an application with everyone in the group, as we've already discussed, but people do get confused, especially when lots of people are trying to take control of the mouse. It's a good idea to review Chapter 8 if you have any questions.

Let's go over some key points from a multipoint perspective. Up to three people can share applications, and they can share quite a few apps from each of those three machines (everyone in the group will receive, or be able to look at and control, the applications).

Sharing applications in group situations is often slow, particularly if the machine doing the sharing is a slow computer like a 486 and/or is using a 28.8 modem. As mentioned in Chapter 8, share your applications from the fastest machines with the most bandwidth. Also, try to encourage everyone to use the same screen resolution.

The Current Call window shows you which meeting participants can accept a shared application, and which ones have turned on their collaboration features so they can take control. (Their entry will say "Collaborate" if they are able and ready to take control; "Sharing" if they are currently sharing an application; and "Not Sharing" if they aren't sharing any application at the current time.)

Sharing applications with a group is one of the best business uses of NetMeeting—this is the first time most Windows users will be able to take advantage of this kind of technology. The next section offers a few different ideas for how you might integrate multiparty meetings into your own business.

SAMSUNG EXHIBIT 1017, Page 202

BUSINESS USES OF MULTIPARTY MEETINGS

When the designers at Winnov were creating the new VideumCam Traveler digital camera, there were several times when they needed to consult with designers in other cities, and even in other countries. Before NetMeeting arrived, there were only a few ways they could collaborate on the design of the camera over a distance:

- They could send color photos via FedEx or UPS, which would mean waiting until at least the next morning to talk with all interested parties about the designs.
- They could fax the photos, but there was always the risk that not enough detail would be transmitted.
- They could email the photos, and then use a traditional telephone, but long-distance rates would quickly add up.

So, NetMeeting came to the rescue. Using NetMeeting, Winnov's designers could put color photographs onto the Whiteboard and collaborate in real-time with all interested parties. Since they used the Internet, they saved a lot of money on long-distance charges. A side benefit was that everyone had very detailed notes of each meeting because NetMeeting forced everyone to type to each other, and the Chat session and Whiteboard could each be saved to disk for review later.

To take it further, the designers were asked to show off their latest design to the rest of the staff. They decided the best way to do that was to use PowerPoint. Instead of walking down the hall to talk about their presentation with each other (besides, one of the designers was in France, and it's a little tough to walk there from California), they used NetMeeting to get a group meeting going. They shared their PowerPoint presentation, and collaboratively each was able to add graphics, photos, and even video and audio clips. This also made it possible for some people to work at home and still participate as if they were "just down the hall." If you've ever been in a Silicon Valley traffic jam, you can see the value of being able to work at home.

But collaboration is just the start. When those designers needed to train the sales and marketing forces (which were all over the world), they assembled a NetMeeting conference and showed all the salespeople the new camera. They were able to train everyone interactively about details like price, size, performance, features, and so on. Again, because Winnov's designers didn't have the capability to do audio and video with each person at the same time, they conducted that training via NetMeeting's Chat window and/or its Whiteboard. This had the added benefit that, after everyone's questions were answered, there was no ambiguity about anything, because everyone had the Chat and Whiteboard

SAMSUNG EXHIBIT 1017, Page 203

sessions to refer to. If the meeting had been held via telephone, some people might have made mistakes while taking notes, and those mistakes could have resulted in lost sales or lost efficiency.

NetMeeting has also become very helpful for technical support. If someone is having a problem, they can join a meeting that includes a full-time technical support person. They can ask questions of the tech-support person and get answers right away, without waiting on hold. As mentioned in Chapter 8, one advantage of this approach is that the person who needs help can share anything on his or her system. The tech support person can see what's wrong, rather than asking for a description of the problem, and the support person can grab control of the system and fix the problem. There can even be two technical support people working together, from separate machines in separate rooms, and they'll be able to collaborate on the problem.

Using an intranet page, the tech support people could even click on an engineer's name to get help with the problem. Using NetMeeting in such a fashion could increase the productivity of the technical support staff, and enable them to more easily correct problems on remote computers.

THIRD-PARTY PRODUCTS

There are several products that your company might consider purchasing to improve your multiparty meetings. Here's a list of the products that were available at press time, and how they might enhance NetMeeting's multiparty capabilities.

- **Microsoft's NetMeeting Web site**. This site contains the latest information on available products and services, including a products directory that's comprehensive and is usually kept up-to-date.

  `http://www.microsoft.com/netmeeting`

- **Accord Video Telecommunications**. Accord's M3C Multipoint Control Unit enables NetMeeting to support large numbers of users, with faster data transmission capabilities, and audio and video too.

  `http://www.accord.co.il`

- **ConferTech International**. This is a service bureau that will help set up and manage your conferences with ConferCallPLUS. It includes audio and data conferencing bridges, password security, scheduling and monitoring, and remote management and network security.

  `http://www.confertech.com`

SAMSUNG EXHIBIT 1017, Page 204

- **Creative Software Technologies**. Makers of CollabOrator System 9000, a low-cost Multipoint Control Unit that includes a multipoint conferencing bridge, conference management, and data routing.

  `http://www.cst.com.au`

- **DataBeam Corp**. Their neT.120 Conference Server includes the ability to schedule, create, administer, join, and track conferences, all in one convenient place.

  `http://www.databeam.com`

- **Data Connection Limited**. DC-Share lets UNIX users share and collaborate with NetMeeting users on Windows.

  `http://www.datacon.co.uk`

- **LiveWorks Inc., a Xerox Company**. Their LiveBoard supports multisite remote interactive sharing of documents and applications. It's a 67-inch rear-projection screen that allows your group to collaborate with remote sites with room lights on.

  `http://www.liveworks.com`

- **Lucent Technologies**. The MultiMedia Communications eXchange (MMCX) server enables multiparty data collaboration sessions, including audio and video, over local and wide area networks.

  `http://www.lucent.com`

- **MCI Telecommunications**. This T.120 Document Conferencing server allows you and remote clients to review documents fast and to connect up to 23 locations, share almost any document, use Whiteboard or application sharing, and communicate via audio technology.

  `http://www.mci.com`

- **MultiLink, Inc**. System 80 Mixed Media Teleconferencing Bridge makes multisite conferences easy to set up with a single icon so you don't have to manage separate audio and data conferences.

  `http://www.multilink.com`

- **OutReach Technologies**. CONFERease is a family of integrated real-time managed voice and PC collaborative conferencing products. CONFERease creates, schedules, joins, and administers conferences from a single browser-based user interface.

  `http://www.outreachtech.com`

SAMSUNG EXHIBIT 1017, Page 205

- **PictureTel**. LiveShare Plus 4.0 is a suite of data conferencing tools that can be used in a multipoint environment.

  `http://www.picturetel.com`

- **Sprint**. The Internet Conference Center lets you initiate voice conference calls via the Internet. Simply access your personal phone book online and point and click on the phone numbers of the people you'd like to meet with.

  `http://www.sprintconf.com`

- **VideoServer**. Internet AudioGraphics Multimedia Conference Server delivers integrated audio plus T.120 data multipoint conferencing services for NetMeeting users.

  `http://www.videoserver.com`

- **White Pine Software**. Meeting Point Server lets you use multipoint audio and video and dataconferencing with any H.323 client, like NetMeeting.

  `http://www.wpine.com`

FROM HERE...

Now you've made a call and hosted a meeting. Hopefully you haven't had any security problems or experienced any difficulty getting around your corporate firewall.

The next few chapters will help you set up your corporate NetMeeting conferencing system:

- Chapter 10, "Considering Security," will help you solve the various problems that you might face when you use a collaboration tool on the Internet.
- Chapter 11, "Configuring Corporate Firewalls," shows you how to set up your firewall to allow use of every NetMeeting feature.
- Chapter 12, "NetMeeting as Part of Your Network," demonstrates ways in which you can integrate NetMeeting into your everyday corporate life.

SAMSUNG EXHIBIT 1017, Page 206

Chapter 10

Considering Security

In this chapter, you will learn:

- **NetMeeting and security.** Incorporating any new product into your network can affect the network's security. This chapter provides an overview of NetMeeting's security features, including security concerns that the program does not address
- **Protecting NetMeeting sessions**. The key to making your calls more secure involves some basic settings. I cover these settings in detail.
- **Security through connectivity**. Components of your network can increase the level of security when using NetMeeting. Network connectivity plays an important role in security.
- **Online techniques**. The security of NetMeeting and your computer can be heightened when you are online by following these simple methods.

As citizens of the Information Age, we store and access almost everything electronically. Virtually all aspects of the business world are recorded and processed by a computer. This information is a valuable resource and must be secured properly so that it does not fall into the wrong hands. Some corporate information,

SAMSUNG EXHIBIT 1017, Page 207

such as personnel records, needs to be kept private, not only from competition, but also from a company's own employees. Even if you are not in a corporate or business environment, the personal information stored on your computer is valuable enough to protect. Security is an issue for everyone.

The effect of any program on the security of your computer and network should concern you. This is especially true for any application that has communication capabilities. This chapter discusses how NetMeeting can affect the security of your computer and network.

UNDERSTANDING NETMEETING'S SECURITY

NetMeeting does not have any built-in security mechanisms. There are no secure sockets, encrypted channels, or virus scanners designed into the software. Does that mean that anyone can connect to your computer and steal your information? Of course not. NetMeeting can be fairly secure if you follow some of the basic steps outlined in this chapter. In many cases, your network may have security mechanisms, such as a firewall or proxy server, that eliminate a number of security risks (at least from the outside).

When considering any security issue, you must evaluate the proper level of safety for the task at hand. There is physical security, such as the location of the computer. Is the computer near a window, can unauthorized people see the screen, or is it in a sealed vault with retina scan access? Can the computer be tapped into with electronic eavesdropping equipment? These are all valid questions to consider, but for your specific application, you might not be worried about electromagnetic or physical security.

Network security is an important topic for most NetMeeting users. You should feel secure enough to know that someone cannot come in from anywhere on the Internet or your corporate network, retrieve information, or make system changes to your computer. NetMeeting contains some features, such as application sharing, that can be used against you if you are not careful. Network programs called *packet sniffers* can be used to watch every piece of data that is sent on your network.

> **NOTE**
>
> If your network firewall or proxy server is set on its highest level of security, then you will not be able to contact users outside your network.

SAMSUNG EXHIBIT 1017, Page 208

Is this meant to scare you from using NetMeeting? No, it is not, but it is meant to make you aware that your computer may be more accessible to prying eyes than you think. Security is and always will be a big issue on the globally connected Internet. Using applications such as NetMeeting add great new productive capabilities to your computer, but they also add new features that can be used to break into your computer. If you want your system to be secure, you must find out where those security holes are and think like a hacker in order to protect yourself from one. NetMeeting can be made secure, and you can learn the steps to ensure that your data is safe.

MAKING YOUR NETMEETING SESSION SECURE

As a general rule, never leave NetMeeting running when you are away from your computer. This completely eliminates the possibility that someone could access NetMeeting while you are gone. If you must leave NetMeeting running while you are away from your machine, ensure that you have disabled the option to automatically accept calls. To check this, follow these steps:

1. On the main menu, click Tools and then Options.
2. Select the General tab (it should already be visible).
3. Clear the "Automatically accept incoming calls" check box (see Figure 10-1).



Figure 10-1. *Clearing the "Automatically accept incoming calls" option.*

SAMSUNG EXHIBIT 1017, Page 209

If you have this option selected, someone will be able to connect to your computer at any time while NetMeeting is running, and you will not be asked permission for their connection. This is the auto answer feature of NetMeeting, and for most users this definitely should be disabled. It is important to note that when a call is automatically answered, the remote party will not be able to access any files or initiate application sharing without your permission.

Another option that you might want to disable (it is disabled by default) is "Run when Windows starts and notify me of calls." This feature automatically starts NetMeeting in a background state when your computer boots up. To disable this option, follow these steps:

1. On the main menu, click Tools and then Options.
2. Select the General tab (it should already be visible).
3. Clear the "Run when Windows starts and notify me of calls" check box.

This option also is shown in Figure 10-1. If you are connected to the Internet using a modem, this option will make your computer automatically connect to the Internet when it boots up. Most users do not want this feature to be enabled—it greatly slows the boot up process. Ideally you should decide when you want to be connected to the Internet, rather than allowing the computer to automatically establish a connection .

UTILIZING NETWORK SECURITY

The manner in which you connect to other users can affect security in your NetMeeting sessions. Components of your network, such as a firewall or proxy server, can provide the needed security that NetMeeting does not have.

The only way that someone can connect to you with NetMeeting is through a network. Even when you are connected to the Internet with a modem, you are on a network. You can use network security to your advantage.

Using Firewalls and Proxy Servers

Firewalls and proxy servers are great ways to keep your network safe from intruders from the vast Internet cyberscape, but they place some serious limitations on how NetMeeting can operate.

> **NOTE**
>
> Refer to Chapter 11, "Configuring Corporate Firewalls" for more information about using NetMeeting with these security devices.

SAMSUNG EXHIBIT 1017, Page 210

These security mechanisms can only protect your computer from people outside your network and can only do so if they are configured properly. One of the best tests is to see if you can connect through your firewall from the Internet. You might be surprised. It will only take you a second to try it, and it may save your company from a serious security hole if you do get in.

You may elect to configure your firewall to allow NetMeeting data to go through it. This is the only way for a NetMeeting user on the network to connect to someone on the Internet. This is a major configuration change in the firewall, and you should consider this with extreme caution. A change to the firewall is the responsibility of your network administrator.

CAUTION

NetMeeting does not encrypt the data it transfers. It is not a simple process to intercept data from your NetMeeting session, but is a possibility. And since the data is not encrypted, it can be deciphered if intercepted.

UNDERSTANDING ONLINE SAFETY

While you use NetMeeting on the Internet, you will be confronted with a number of different types of people, some of whom you may not want to deal with. Generally, you should treat someone online the same way that you would treat someone who you are meeting for the first time in person. An online relationship is similar to an in-person relationship—you should take the time to build trust in someone before you share applications or swap files with them. Use your common sense.

NetMeeting is a live communication tool with video and audio, which means that you should be careful, especially when children use your computer. They should be taught not to speak to strangers on the computer, in the same way that they would not speak to strangers on the street. Online users represent a similar threat and in many cases a more serious one. Unfortunately, there are some sick people out there and you need to guard against them.

Turning Off Video

One way to ease into meeting someone is to turn off the video when first connecting. This is, of course, assuming that you have video. You may not want to send a picture of yourself and you may not want to see the other person until you have established some sort of communication through the Chat, Whiteboard,

SAMSUNG EXHIBIT 1017, Page 211

or audio features of NetMeeting. Video represents a rich data type that can contain anything. And believe me, you can see just about anything on the Internet (including flashers!). To modify your video options, follow these steps:

1. On the main menu, click Tools and then Options.
2. Select the Video tab.
3. In the "Sending and receiving video" area, clear both options if you do not want them enabled (see Figure 10-2).

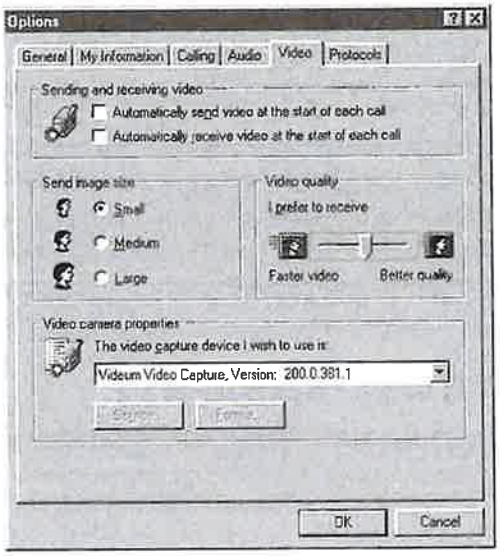


Figure 10-2. *Clearing the automatic video options.*

Using a Monitoring Utility

Another way to establish online safety is to use a connection monitoring utility that can show network activity. There is a command line utility, which comes with Windows, that lets you know when someone is attempting to call you and shows you what addresses are currently connected. A command line program means that you will have to open an MS-DOS window; it is not a Windows program that can run by itself. To run this utility, follow these steps:

1. Click Start.
2. Select Programs.
3. Click MS-DOS. A new window appears with an MS-DOS prompt.
4. At the prompt (most users will see C:\WINDOWS), type "NETSTAT -n 30".

SAMSUNG EXHIBIT 1017, Page 212

This brings up a screen like the one shown in Figure 10-3. Using this example, Netstat will show you the IP address of every network connection on your computer every 30 seconds.

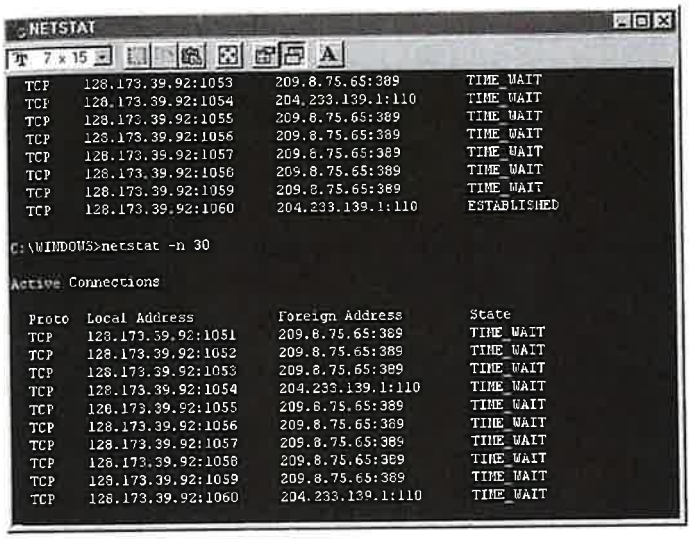


Figure 10-3. *Netstat Screen with "netstat -n 30".*

The syntax of this utility is as follows:

```
NETSTAT [-?] [-a] [-n] interval
```

There are a several parameters to this utility, as shown:

Parameter	*Example*	*Description*
-?	Netstat -?	Shows the built-in help for NETSTAT.
-a	Netstat -a	Shows all connection names and ports.
-n	Netstat -n	Shows all connection IP addresses and ports.
interval	Netstat -n 30	Sets a recurring interval (in seconds) to check the network's status. In this example it is checked every 30 seconds.

Netstat shows you connections that are made by any Internet program and that includes NetMeeting. You can watch the output of Netstat to verify the network address of the person that is calling you. You can also tell if someone

SAMSUNG EXHIBIT 1017, Page 213

is attempting to make an unauthorized connection to your computer. Try running this utility during a NetMeeting session and see what happens. You will be amazed at the number of connections that are established during one session.

Avoiding Viruses

The best way to avoid a virus with NetMeeting is to use a virus scanner to check any files that are transferred to you during a conference. This must be done before you install or execute (run) the files because installing or running the file is the only way that you can get a virus. The transfer itself does not activate the virus.

There are a number of commercial virus scanners available, and if you do a lot of work on the Internet, this is definitely a good investment. McAfee AntiVirus is an example of a good virus scanner. See Chapter 8, "Application Sharing and File Tranfer," for more details about virus protection.

Sharing Applications Safely

As with all security, you should use your common sense. If there is an application that you do not want anyone to have access to, then do not share it. Once you share an application, everyone in the conference can see its contents and can take control of it if you have enabled collaboration for that application. An application can only be used by others when you choose to collaborate; otherwise the members of your conference will only see an image of the application. It is when you choose to collaborate and who you collaborate with that is important.

You must also be careful of which applications you share. You can share your entire desktop by sharing Explorer. This means that a remote party can do anything on your computer that you can do, including delete files. They can even shut down your computer remotely. Only share the entire desktop with someone that you *really* trust. Refer to Chapter 8 for more information about how to use application sharing.

FROM HERE...

This chapter examined the security of NetMeeting and showed you some ways to increase your network protection. These simple steps can make you feel good about the security of your conversations.

The following chapters present related information:

- Chapter 11, "Configuring Corporate Firewalls," discusses how to configure firewalls and proxy servers to work properly with NetMeeting.

SAMSUNG EXHIBIT 1017, Page 214

- Chapter 12, "NetMeeting as Part of Your Network," shows how NetMeeting can become an important part of your company's network.
- Chapter 13, "Setting up Your Own NetMeeting Place," covers the setup and configuration of the Internet Locator Service (ILS). If you use NetMeeting in a closed network environment, setting up your own ILS is a good idea.

SAMSUNG EXHIBIT 1017, Page 215

Chapter 11

Configuring Corporate Firewalls

In this chapter, you will learn:

- **Limitations of using a firewall.** Security is an important function of a firewall, but it can sometimes prevent NetMeeting from working outside your network. This section looks at the benefits and limitations of using NetMeeting with a corporate firewall.
- **Configuration.** This section gives you all the information you (or your network administrator) need to set up a firewall with NetMeeting.
- **The Process.** This is a brief discussion of NetMeeting and network security.

Anyone who has ever installed a corporate network and connected it to the Internet knows about firewalls. A properly configured firewall won't let you use NetMeeting to contact others on the Internet unless you make some changes.

SAMSUNG EXHIBIT 1017, Page 217

Chapter 11

Configuring Corporate Firewalls

In this chapter, you will learn:

- **Limitations of using a firewall.** Security is an important function of a firewall, but it can sometimes prevent NetMeeting from working outside your network. This section looks at the benefits and limitations of using NetMeeting with a corporate firewall.
- **Configuration.** This section gives you all the information you (or your network administrator) need to set up a firewall with NetMeeting.
- **The Process.** This is a brief discussion of NetMeeting and network security.

Anyone who has ever installed a corporate network and connected it to the Internet knows about firewalls. A properly configured firewall won't let you use NetMeeting to contact others on the Internet unless you make some changes.

SAMSUNG EXHIBIT 1017, Page 218

This chapter outlines the limitations and configurations of a firewall for use with NetMeeting. If you're a network administrator or if you work with corporate networks, you'll find useful information in this chapter.

RECOGNIZING NETMEETING'S LIMITATIONS ON CORPORATE NETWORKS

What's the big deal with security on a network? Chapter 10, "Considering Security," covers security and why a corporate network must have a firewall.

A firewall can be one device/computer or a group of routers, gateways, and hosts that work together to prevent unwanted data transmission into and out of a corporate network. This network is a communications pipeline with or without NetMeeting.

A properly configured firewall gives you and your organization peace of mind that the data on your network is secure. You know that no one is listening in on any of your important electronic conversations, including conversations using NetMeeting or any other application on your network.

Understanding the Packet's Function

A firewall's job is to monitor all network packets that flow between the outside world and your network. As you learned in Chapter 1, "An Overview," all network transactions use packets to send and receive data. These can be various kinds of packets, and they can hold both the sending and receiving network node address.

Perhaps the most important part of the packet header for security is the port number. Every application or service that uses a TCP/IP network must send data on a specific port number. You can think of this port number as a telephone extension.

Consider this analogy: when you call a friend at another company, the phone number you dial to reach the company's switchboard is like the IP address and your friend's extension is like the port number. You can call the same phone number and reach many different people, just as a network program can send data to the same IP address and talk to different services or applications. It is this capability of the network that allows you to access both an email server and the Web server at the same time on one computer. Both applications access the network at the same time and transfer different types of information without any conflict.

For every IP address, there are a total of 65,535 port addresses available, ranging from 1 to 65,535. Here's a list of the commonly used service ports, with their port numbers, on the Internet:

SAMSUNG EXHIBIT 1017, Page 219

Service	*Port number*
Echo	7
Daytime	13
File transfer protocol (FTP)	21
Telnet	23
Simple mail transfer protocol (SMTP)	25
Finger	79
Hypertext transfer protocol (HTTP)	80

NOTE

Most people use the HTTP protocol on port 80. This protocol transports data such as HTML and images between a Web server and a Web browser. A firewall with port 80 open allows users to access Web servers outside the local network.

Understanding the Firewall's Function

Now that you know a bit about firewalls and the protocols used on the network, you'll learn how the firewall does what it does.

The header of every packet that reaches the firewall is scanned before it's allowed to go through the firewall. This means that all traffic between the outside world (the Internet) and your network is examined.

If the port is open, the packet goes on its merry way through the firewall. Otherwise, it is rejected by the firewall and not allowed to pass through. This process is applied to both incoming and outgoing packets. Most firewalls will allow you to configure different open ports for incoming and outgoing network traffic. So you could turn on port 80 (HTTP, Web browsing) for outgoing traffic but not allow incoming connections. This allows your network users to browse the Internet, but prevents anyone from the Internet from browsing your network.

As a network administrator or someone who works with a corporate network, you should be concerned about the kinds of data allowed through your firewall. If you close port 21 for a service such as file transfer protocol (FTP) for incoming and outgoing traffic, you prevent someone on the Internet from using FTP to retrieve files from your network. At the same time, you prevent any other businesses that you work with from exchanging files using FTP.

SAMSUNG EXHIBIT 1017, Page 220

Most firewalls are configured to allow only HTTP (port 80) for Web browsing and SMTP (port 25) for email. This prevents the exchange of data at any other port. A firewall can also be configured so that inbound and outbound data from your network is restricted or granted access according to its Internet address and service port. This allows for very specific control of network traffic. With this capability, you can give or take away Internet access to any computer or group of computers on your network. This is pretty handy when you find that someone is abusing the Internet by spending the entire day surfing the Net for nonbusiness reasons.

Firewalls are also called *proxy servers*. These names are used interchangeably, so if you ever want to start a good argument in a group of computer nerds, ask them the difference between a firewall and a proxy server.

A proxy server is part of a firewall security mechanism. The most common form of proxy server is a *Web proxy server*. If you have one of these, you won't be able to use NetMeeting to contact people on the Internet through your network.

This is because a Web proxy server only handles services for Web servers and browsers through port 80. The really smart Web proxy servers cache Web pages and do other neat tricks such as limiting the kind of Web content that can be seen on your network.

If some people are on the Internet looking at pornographic material all day instead of working, you should consider using a Web proxy server as a part of your firewall. With these servers, you can usually record all activity through the network. Then you can see who's spending the day surfing the Net.

NetMeeting has limits on what it can do, depending on your firewall and what your network management thinks about changing the firewall's configuration to enable NetMeeting connections.

You have several factors to consider, including your confidence in the firewall, the network load, and network security. As you'll see in the next section, NetMeeting needs some pretty significant openings in the firewall for all its features to work.

TIP

An *open port* is a service port on the firewall that's configured to allow packets containing the open port number to pass through the firewall. Otherwise, the packet is rejected.

SAMSUNG EXHIBIT 1017, Page 221

UNDERSTANDING PERMISSIONS AND OTHER NETWORK CONCERNS

In this section, you'll learn how to make NetMeeting work with a firewall, your digital information's watchdog.

It may be impossible for NetMeeting to go though your firewall. Maybe the firewall doesn't handle the packet types sent via NetMeeting. Or maybe you or your network administrator are concerned about the increased number of open ports required by NetMeeting.

Unfortunately, there are too many configurations possible to give you an example of how to set this up. If you're interested in learning more about firewalls, see *Building Internet Firewalls* (D. Brent Chapman and Elizabeth D. Zwicky, O'Reilly & Assoc. Inc., 1995).

Understanding Packet Types

The packet types accepted by your firewall are a limiting factor for most firewall users. The two IP packet types are Transfer Control Protocol (TCP) and User Datagram Protocol (UDP).

A common configuration allows only TCP packets or TCP connections across the firewall through a set of service ports. The firewall can also be configured to allow only primary connections, which means that a computer inside the network can only make one connection to the outside.

Secondary connections, which are any connections made simultaneously after the primary connection, may not be allowed by your firewall (your first connection is the primary and any others are secondary).

UDP packets are used to send nonguaranteed data (the protocol specification states that the deliver of data is not guaranteed, unlike TCP, which is guaranteed) for broadcasting and for other applications, such as NetMeeting audio and video. UDP packets are considered one of the less secure packet types because they can be transmitted without an active connection.

To use the NetMeeting multipoint data conferencing features such as the Whiteboard, Chat, and application sharing, your firewall needs to allow only primary TCP connections on the service ports shown in the table in the next section of this chapter. The audio and video features use UDP.

The NetMeeting multipoint data conferencing features also make secondary TCP and UDP connections on dynamically assigned ports. This means the audio and video data can be on any unused service port number between 1025 and 65535. All of these ports will have to be opened on the firewall if you want

SAMSUNG EXHIBIT 1017, Page 222

to enable video and audio data between NetMeeting users on the Internet and those on your network. This might be a security concern.

But there's hope on the horizon for tighter security and integration using H.323, the standard for video telephony and firewalls. Both Cisco and Intel have announced and tested solutions for secure, standards-based conversations.

And don't forget that the NetMeeting data conferencing features can be extremely effective without audio and video.

> **TIP**
>
> Consider installing NetMeeting on a computer in your conference room. Use the speaker phone for audio, and NetMeeting as a collaboration tool for you and the remote participant. This leaves your network secure while you use NetMeeting to enhance your business.

Deciding Which Ports to Open

Suppose you've decided to configure your firewall to allow NetMeeting connections. The following table shows the service and packet type for each port number. Give this table (or this whole chapter!) to your network administrator.

Service	*Packet type*	*Port number*
Internet Locator Server (ILS)	TCP	389
User Location Server (ULS)	TCP	522
T.120 (data conferencing)	TCP	1503
H.323 call setup	TCP	1720
Audio call control	TCP	1731
H.323 call control	TCP	Dynamic
Video data	RTP/UDP	Dynamic
Audio data	RTP/UDP	Dynamic

One packet type in the table that has not been discussed in this book yet is RTP/UDP. Real-Time Protocol (RTP) is built on top of UDP to provide the real-time transport of data on the network. This is important for audio and video (RTP/UDP is really a UDP packet).

If you're going to use all the NetMeeting features through the firewall, you must enable primary TCP connections to pass through on ports 389, 522 (if you're

SAMSUNG EXHIBIT 1017, Page 223

using ULS), 1503, 1720, and 1731. You must also enable secondary TCP and UDP connections on dynamically assigned service ports 1025 through 65535.

To enable only the data-conferencing features, such as the Whiteboard, Chat, file transfer, and application sharing, configure the firewall to pass through primary TCP connections on 389 (for ILS directories) and 1503.

This last configuration is a fairly secure way to use NetMeeting through a firewall. Allowing primary TCP connections on static ports is considered as secure as you can get without disconnecting the Internet from your local network.

> **TIP**
>
> If the ILS server is on your network, you don't need to open port 389 on the firewall for outbound traffic. But you may want to enable inbound packets on this port so that people outside your network can easily connect to your network users.

TRACING NETMEETING'S PATH THROUGH A FIREWALL

In this section, you learn what part the firewall plays in making a connection. You'll see what happens if one or more of the ports needed aren't open on the firewall.

The first step in any NetMeeting conversation is to make a connection. If you're using ILS for directory services, which you probably are, a connection on port 389 is made between NetMeeting and the ILS server for the exchange of directory information. If you are using a Web-based user directory, this open port is not necessary because all of the directory information can be provided through the Web server port 80.

If you're using ULS or the ULP portion of ILS, port 522 is used instead. See Chapter 13 for details on setting up directory services for NetMeeting.

> **NOTE**
>
> ULS is no longer supported by Microsoft, but the ULP protocol, which is used by ULS, can be enabled on ILS for compatibility with NetMeeting version 1.0. It's strongly recommended that you use ILS and disable ULP since ULP will be removed in future versions of the ILS.

SAMSUNG EXHIBIT 1017, Page 224

You may choose not to use a directory server but instead type the network node address directly into the Call dialog box. In this case, skip the last step. Both cases make a primary connection on port 1503 for data conferencing and on port 1720 for audio and video conferencing setup.

The last connection, which is a secondary connection, is used to negotiate the TCP port that handles call control. Finally, the UDP ports for the data are negotiated for the RTP packets that carry the audio and video data.

UNDERSTANDING THE LIMITATIONS OF PROXY SERVERS

You learned some of the basics of firewalls and proxy servers earlier in this chapter. Next, you'll learn about the limitations of some firewalls. A few of these limitations come from how a proxy server works and how it is implemented.

A proxy server makes your network look like a single IP address to the Internet. All data coming to and going out of your LAN will contain the destination address of your proxy server. It is in this manner that a proxy server can provide security, because everything must go through it, and only network traffic that is bound for its IP address will be allowed to pass through (if it also meets all the other criteria).

Remember that a proxy server is just a component of a firewall. As you already know, NetMeeting uses secondary TCP and UDP packets for the audio and video features. If your firewall doesn't accept this kind of connection, and some don't, you can't use NetMeeting audio and video. However, directory services and data conferencing are still available.

Some firewalls don't allow dynamic internal addressing. In this case, you can make outbound NetMeeting connections. These are connections between computers inside your network and computers outside your network.

But users outside the firewall can't make connections with users on your network. When users on your network call someone outside the network, they can access all of NetMeeting's features, including audio and video. But when someone outside the network calls a user on your network, the user *can't* access all of NetMeeting's features.

When your firewall consists of a Web proxy server, you can't configure NetMeeting ports. Instead, the proxy server supplies users with Web browsing capability. So if you have a Web proxy server, you can't make any kind of NetMeeting connection. In that case, it may be time to consider upgrading the firewall.

SAMSUNG EXHIBIT 1017, Page 225

USING NETMEETING ON A CORPORATE NETWORK

Your organization may have concerns about opening the many ports needed to use all NetMeeting's features. Some policy issues may also need to be hammered out.

For example, should users on your network be able to conference with outsiders? Considering the network capacity and your firewall capability, should users on your network bring additional data through your firewall? Suppose that additional data prevents the efficient transfer of more important data?

If NetMeeting calls aren't allowed through your firewall, you can still use NetMeeting inside your network. And you may find great value in holding NetMeeting conferences on your local area network (LAN) or wide area network (WAN), without using the Internet. Then you don't have to worry about the firewall configuration.

You may even want to make sure that the NetMeeting ports aren't open to the outside for incoming traffic. This prevents anyone on the outside from connecting to your network and it's just as important as not allowing your users to call people on the outside.

On a WAN, you can hold conferences with people in remote buildings without having to walk or drive. This saves time and so saves money.

In fact, the way to get NetMeeting onto your network is to address how it will affect the bottom line. You probably wouldn't get approval for NetMeeting just because it's cool. Well, it is cool, but it can also help the bottom line.

FROM HERE...

In this chapter, we have looked at how to configure your company's firewall to work with NetMeeting. With this information, your network administrator can allow users to connect with others on the Internet through your firewall or proxy server.

The following chapters provide additional information about NetMeeting and the corporate environment:

- Chapter 10, "Considering Security," details what security factors you should consider when implementing NetMeeting.
- Chapter 12, "NetMeeting as Part of Your Network," provides tips on using NetMeeting on your network.

SAMSUNG EXHIBIT 1017, Page 226

Chapter 12

NetMeeting as Part of Your Network

In this chapter, you will learn:

- **Online integration**. NetMeeting can work with your other online systems and corporate network, and you'll see how to make that possible.
- **Enhance your conference calls**. Tips for spicing up your conference calls with NetMeeting.
- **Telecommuting**. Use NetMeeting from home so that you don't have to go into the office.
- **Build an Internet Locator Service community**. Create an online community by using the ILS.

Most corporations have spent a fortune equipping their employees with computers and networking these computers together. The driving force behind the deployment of networks in corporate America was, and continues to be, the need to rapidly share and utilize central data banks of information and other resources.

For example, you are sitting at your desktop and, for a presentation, you need to access company records about last year's sales trends. Your network and network servers will play a vital role in helping you accomplish this task.

SAMSUNG EXHIBIT 1017, Page 228

There is no doubt that your network and desktop PC are valuable to you and to your business. What you may not realize is that if you add NetMeeting to the applications on your network, you'll have the ability to enhance your network's capability and to ascend to another level of network usage.

If you are thinking, "This NetMeeting is pretty cool, but how can I really use it?" then this is the chapter for you. The central focus of this chapter is how you can use NetMeeting to empower your network and its users with a new tool that saves your company time and money. Obviously, this chapter is designed for the corporate or small business user that has a network—not the home user. However, there is no reason that the home user, who probably can access a network at the office, cannot get value from this chapter.

INCORPORATING NETMEETING

If your business is like most, then you have an Internet Web site, an internal network, a firewall, and limited access to the Internet from within your organization. The network is used as a communication tool. You communicate company information to a broad spectrum of employees through an internal Web site, and you communicate on a group and individual basis through the use of electronic mail. The days of the hardcopy memo are not gone yet, but they are drawing to a close. If you are really advanced, then most of your business transactions go through your network.

What can NetMeeting do for your network that your network is not already doing? It can add real-time interactive communication. By real-time, I am referring to "live" as opposed to delayed transactions. A telephone conversation is an example of a real-time application because the moment you speak into one side, your voice comes out the other side. Email is a good example of a non-real-time application because the message is not instantaneously received by the recipient. The message is sent to a mail server and is relayed and stored for retrieval. You may have experienced near real-time email with someone who was online at the same time that you were, but this is not actually real-time.

> **NOTE**
>
> If you have a firewall or proxy server on your network and you want to use NetMeeting on the Internet, you will have to make some changes for NetMeeting to work properly. See Chapter 11, "Configuring Corporate Firewalls," for details on how to configure your firewall or proxy server properly.

SAMSUNG EXHIBIT 1017, Page 229

All of the features of NetMeeting are real-time. When you use the audio features to transmit speech, that voice is received and played back on the remote computer a fraction of a second after it is recorded and transmitted. When you move your hand in the video window, it is sent and played back on the other side the moment you move your hand. When you mark on the Whiteboard, all members of the conference receive those marks on their Whiteboards, too, at the same time.

> **CAUTION**
>
> Be aware that high network traffic can introduce delays that lower the Quality of Service (QoS) of the transmission. This affects the real-time capability of NetMeeting.

Each of NetMeeting's features can add a unique new capability to your network. Understanding how they work will help you understand how to use them properly. Each feature is highlighted in its own chapter for more detailed reference on implementation and capabilities. Here's a quick rundown of how your organization can use these features:

- **Text Chat**. Multipoint mechanism for communicating online—good for those users who may not be equipped with sound and/or video capability. Since video and audio are not multipoint, this feature is a great way to bring people together online for group discussions without requiring a lot of network bandwidth or computing power. This is also a good tool for hearing-impaired individuals.
- **Whiteboard**. Create technical drawings or have brainstorming sessions. This is especially good for engineers who are in different locations and need to collaborate graphically on a common drawing.
- **File Transfer**. Instantly send vital documents during a conference. This can be more efficient than application sharing by sending the required documents and synchronizing the interaction. You can send your PowerPoint presentation to all participants and allow them to go through it at their own pace during the session. You can then use Chat to give them direction—for instance, "Now go to page 4 of my PowerPoint presentation."
- **Application Sharing**. Remotely control a computer for technical support or interactive collaboration of a document. Your users can

SAMSUNG EXHIBIT 1017, Page 230

take advantage of this tool to jointly edit and create a PowerPoint presentation or Word document. Actually, any application can be shared by a group and used collectively.

- **Audio**. Allows speech communication during a conference. Use your computer network as a telephone network.
- **Video**. Add expression and color to your virtual presentations. This makes the other features more personal than when used alone.

Separately, each of these features is useful, but when used together they can really be powerful. Let's say that your marketing department needs to create a new pamphlet on a hot new product. In order to create this new piece of product literature, they need to communicate with the product development team, which is at another office thousands of miles away. Your company could either pay to fly one group to the other, or you could use NetMeeting.

What is required to make this happen? First, both sides have to be networked together either through your intranet or the Internet. See Chapter 4, "Making Your First Call," for information on how to connect two sites together. It does not matter which way you connect, although an intranet will be more reliable and more efficient than the other options. You will also need two computers equipped with NetMeeting and the appropriate hardware. For our example, we are going to use all of the features, so we will need a sound card and a video capture card installed in both computers. See Chapter 3 for installation instructions.

Once we have fulfilled all of the hardware and software requirements, we need to set up the meeting. Establish a time for the two groups to meet online and ask both groups to prepare the material they want to present. The marketing group should have a mock-up of the pamphlet prepared and the product team should have any product literature ready. Let's assume that the pamphlet is a hardcopy representation, not electronic, and the product literature is in Microsoft Word format. Any useful information should be gathered prior to the meeting to avoid wasting time.

Now we are ready for the meeting. Connect the two sites together (see Chapter 4 if you have any trouble). Both groups should be able to see and talk to each other. It is always good to start the meeting by introducing all the members of each group. This will also test out both computers and the connection between them.

In this example, the marketing group is going to lead the discussion by using the video feature to show the mock-up pamphlet to the product team. They may need to select the "large" and Highest Quality video options for the pamphlet to be properly displayed on the product group's computer. See Chapter 7, "Video Conferencing," for tips on using the video feature. Undoubtedly, the

SAMSUNG EXHIBIT 1017, Page 231

product group is going to have lots of suggestions. This is where the other features of NetMeeting come into play.

First, they use the Whiteboard to draw a new prototype and brainstorm about various topics of its design. Next, the marketing group opens the software that they created the pamphlet with and shares it (application sharing). Now the two groups apply their brainstorming work from the Whiteboard into the electronic version of the pamphlet. Keep in mind that during this entire time, both groups were also using the audio and video features of NetMeeting. The file transfer feature was used to transfer the product specifications to the marketing team. These will be inserted into the pamphlet later.

When they are finished, the marketing group should have an electronic version of the pamphlet, which was a collaboration of the two teams, ready to print. Both teams were able to stay at their own offices, which allowed them easy access to their resources and saved them traveling time and expense. I am sure you will agree that is a much more efficient way to complete the task than bringing the two groups together in a physical meeting.

ENHANCING YOUR CONFERENCE CALLS

Conference calls are a good way to get two or more groups of people together on the telephone to discuss business. You might hammer out details of a business deal or discuss the technical specifications of your company's newest widget. In both cases, several people work together and discuss ideas from remote locations, using the telephone as a communication tool. One or more of the participating locations is probably in a conference room for the call and is full of people.

If you have ever been a party to a conference call, then you know that it can be difficult to coordinate meeting times and get the conference going. Once you start, you are at the mercy of the speaker phone to manage speaker volume and sensitivity. A conference call can be a valuable communication tool that can save you from having to travel. But there are still some limitations of a conference call that force you to have a physical meeting anyway. What are these limitations and how can NetMeeting overcome them?

One of the biggest limitations of a conference call is the lack of visual aid. If you are presenting a new idea or tearing apart an old one, visual aids such as slides or diagrams can help get a point across to others. How do you show a modified sales structure through the phone? You could describe it, but the message could be misinterpreted or misunderstood. In many cases, there are no substitutes for visual assistance.

The electronic Whiteboard feature in NetMeeting is just one of the many capabilities that can add visual interest to a conference call. With the Whiteboard, you can draw figures, type words, and even present slides by pasting images.

SAMSUNG EXHIBIT 1017, Page 232

These are just a few things that the Whiteboard can do. Even better, all members of the conference can see, manipulate, and make marks on the Whiteboard. This lets every member interactively communicate new ideas in real-time so that everyone can see and build on those ideas.

The Whiteboard is great, but what if you have a document that you want to work on together? You want the changes and ideas of the meeting to immediately affect the document. Let's use a proposal as an example. Within your organization, there are two groups (Group A and Group B) that are working on a proposal for a new contract, but these two groups are separated by 1000 miles. How can you help them be more efficient? You could let them bounce the document back and forth as an email attachment with the modifications highlighted, or you could show them the application sharing capability of NetMeeting.

Application sharing enables the two groups to work in the same program, such as Microsoft Word, on the same document at the same time. I really mean the same program, not two copies of the same program, but one original, and a visual copy of the original. How does this work? You should read Chapter 8, "Application Sharing and File Transfer" for the details, but basically a visual mirror image is sent to the remote computer. Any mouse clicks or mouse movement on the mirrored user interface (on the remote computer) is duplicated on the source (host) computer. If you look back at the example, Group A runs Microsoft Word on their computer and loads the proposal. Then both groups run NetMeeting. The order is not that important, so both could run NetMeeting first. Next, they establish a conference and Group A shares Microsoft Word. Group B, the remote group, gets a live, mirrored version of Microsoft Word with the proposal already loaded. Note that Microsoft Word does not have to be loaded on the remote machine.

TIP

You may find that the quality of the audio provided in NetMeeting does not suit your needs. This is especially true if you have more than one person at each side of the conference and they are not using headsets. It is difficult, perhaps impossible, to equip 10 people in a conference room with headsets. In this case, you may find that using your telephone conferencing system while you use NetMeeting works great. There are also devices designed specifically for room conferencing with your computer (see Chapter 18, "Products That Extend NetMeeting"). In any case, your speaker phone is designed to handle a room full of people better than NetMeeting and provides you with better audio communication.

SAMSUNG EXHIBIT 1017, Page 233

Now both groups can make modifications together and cut down the amount of time required to complete the document. Remember that you can use all of the other features at the same time, so you can have the audio and video going when you are sharing applications and using the Whiteboard.

The video feature is one of the most powerful visual tools provided by NetMeeting. You might wonder why you need to see the other people in the conference room. You would be surprised at how much video can enhance what would normally be a voice conference call. Facial expression and body movement are important communication signals that are especially helpful in getting your message across. These nuances are lost completely when you use the telephone.

Video adds a personal touch to a meeting. If you have ever used a video conferencing system before, then you know what a difference it can make.

Combine video with all the other features and you have an electronic conferencing system for your desktop that can truly save you and your business time and money. All it takes is two multimedia-capable computers set up in remote conference rooms, or offices with NetMeeting installed and a network between the two. These are items that you may already have.

The more you use NetMeeting to enhance your conference calls, the better you will get at it. You and the others will have to learn how to take advantage of this new way to communicate. This book provides you with many tips to enhance the conferencing experience.

USING NETMEETING FROM A HOME OFFICE

Telecommuting is becoming increasingly popular with many large and small businesses. It is also popular with employees. Telecommuting allows you to work from home, using your computer and a network connection to interact with your employer and clients. I can't think of a better environment to work in than one's own home. NetMeeting is an application that facilitates telecommuting by providing you with additional communication tools.

I am an avid fan of telecommuting and use it in my own business. Actually, it has become a way of doing business. My business is software application design, development, and consulting. I am always traveling, but I'm always connected to my office and to my clients through email, voice mail, and even through online conferencing. I use the Internet when I am on the road and dial into my company's network when I am at home.

Like me, you can use NetMeeting from home by dialing into your company's network or through an Internet service provider. The first method is more secure and more efficient. The easiest way to implement dialing into the company network is to use the Remote Access Service (RAS) of Windows NT. It

SAMSUNG EXHIBIT 1017, Page 234

is outside the scope of this book to describe the details of how to set up RAS on Windows NT. The Remote Access Service provides network resources to a dial-in user. It allows you to use file servers and network printers, for instance, from your home. This service, when properly configured, provides the necessary Internet protocols so that you can also use NetMeeting from home. Consequently, you can also use your Web browser and other Internet applications too.

> **NOTE**
>
> Your firewall will have to be configured properly if you use the Internet to connect to someone on your corporate network. See Chapter 11, "Configuring Corporate Firewalls," for more details.

Using NetMeeting from home is no different than using it from the office, except that you get to stay at home, which is definitely a plus. All of the functions operate exactly the same as they do when using it on your network at the office. In the examples in this chapter, any of the participants could have easily been working from home instead of at a company office.

USING THE ILS TO CREATE A COMMUNITY

The Internet Locator Service (ILS) is used by NetMeeting to provide directory services. Directory services help you connect with other users on the network. Actually, NetMeeting does not require that you use an ILS to make a connection, but an ILS does make it easier to establish connections. It does this by providing a list of currently active NetMeeting users on your network (as explained in Chapter 4). See Chapter 13, "Setting Up Your Own NetMeeting Place," for instructions on how to set up your own ILS. You will also increase the security of your NetMeeting sessions by creating an internal ILS. Chapter 10 and Chapter 13 cover this aspect of the ILS in detail.

When NetMeeting is started and configured to use the ILS, it will log into the ILS server and report several pieces of valuable information to the server. This information describes the NetMeeting user that is logging on to the server: name, location, email address, comment, audio capability, video capability, call status, and user type, are transmitted to the server. The ILS associates an IP address to this information. In return, the ILS provides a list of other NetMeeting users that are available online. If you have an ILS installed on your Windows NT Server (required for ILS), then you can configure all of the NetMeeting clients on your network to log on when they are running.

SAMSUNG EXHIBIT 1017, Page 235

> **NOTE**
>
> You must have the TCP/IP protocol available on your network to use the ILS with NetMeeting.

A directory of online users enables you to verify who is online and available. When a user is in a call, NetMeeting informs the ILS, and likewise, when a call is terminated, the ILS is also notified. With this call status information, the ILS can indicate whether a user on the listing is not only online, but if they are in a call. When a user is in a call, there will be a red star on the top right corner of the computer icon in the user line listing.

> **NOTE**
>
> NetMeeting can be configured not to log on to the ILS or not to list the user. Refer to Chapter 4, "Making Your First Call," for details on how to configure NetMeeting in this manner.

Setting up your own ILS creates a permanent, virtual meeting place for your users that will make everyone's lives easier. Otherwise your users will have to type in network host or IP addresses to make connections. If your network uses dynamic addressing, this can be a real headache. Setting up an ILS will facilitate the use of NetMeeting, as it can only work when it is running and people have a method of establishing a connection.

FROM HERE...

In this chapter, I have shown you some ways that you can take advantage of NetMeeting to give your network users new capabilities. Whether you're in a corporate office, remotely linking with associates and clients, or working at home in your bedroom slippers, NetMeeting lets you "be there now" and gives you face-to-face capabilities.

For more information about the topics addressed in this chapter, see the following:

- Chapter 9, "Hosting a Group Conference," covers how you set up a multipoint conference for a group meeting.

SAMSUNG EXHIBIT 1017, Page 236

- Chapter 11, "Configuring Corporate Firewalls," discusses the changes required to your network firewall or proxy server for NetMeeting to operate properly.
- Chapter 13, "Setting Up Your Own NetMeeting Place," demonstrates the steps needed to configure an Internet Locator Service (ILS) on your network.

SAMSUNG EXHIBIT 1017, Page 237

Chapter 13

Setting Up Your Own NetMeeting Place

In this chapter, you will learn:

- **Installation.** This chapter provides information on how and why you should have your own NetMeeting place.
- **Implementation.** The Internet Locator Service (ILS) offers a wide variety of options and configurations to suit your needs for creating a virtual meeting place. This section takes a close look at these options.
- **Operations.** Once you have your own place for NetMeeting on your network, you should know how to administer, maintain, and monitor the ILS.

You've read about directory servers throughout this book. Without these directories, it is virtually impossible to locate and call other NetMeeting users who are on the Internet or a corporate intranet. The directory server software provided for NetMeeting, the Internet Locator Server (ILS), is available at no additional cost if you have Windows NT Server. If you are going to use NetMeeting within your corporate LAN or for a private community on the Internet, then you need to set up an ILS to provide your own NetMeeting place. This chapter covers the installation and operation of an ILS

SAMSUNG EXHIBIT 1017, Page 238

server. Once you have an ILS server running, operating it is a snap. If you do not need to set up a directory server, you won't need to read this chapter.

INSTALLING YOUR OWN CORPORATE INTERNET LOCATOR SERVER

Directory services are necessary for live, real-time communications because most users' information is dynamic. This is especially true of the IP address. Every time a user comes onto the Internet, a different IP address is assigned. If your company or organization includes people who travel and connect to the Internet with their portable computers, then the ILS locator services will be helpful. You can use a directory server to publish current addresses so you can easily make any connection to any real-time communication application.

Several companies, including Microsoft, provide public ILS services. But there are a couple of benefits to installing your own server including added security, better performance, and customization. By creating your own server, you can create a virtual online community and have complete control over it. Before you can start the ILS installation process, you will need a couple of things.

First, there are a number of software and hardware requirements. The basic requirement is that you run Windows NT Server 4.0 with Internet Information Server (IIS) 3.0, and make sure you have the latest Windows NT Service Pack installed. As far as hardware, if you can run Windows NT Server 4.0, you have the required hardware. The basic minimum recommendation from Microsoft is a 486/25 with 16 MB of RAM. If you have any experience with Windows NT Server, you are probably laughing at this configuration because it would perform very poorly, to say the least. As a general rule, you should purchase as much RAM and the fastest processor when configuring a new Windows NT Server machine. I recommend a Pentium class computer with a minimum of 64 MB of RAM.

> **NOTE**
>
> The ILS will not run on Windows NT Workstation 4.0. You must have Windows NT Server 4.0 with IIS 3.0 and the latest Service Pack.

The ILS has been designed to be highly scalable, which means that as your requirements increase (as more people use the ILS), you can expand the hardware

SAMSUNG EXHIBIT 1017, Page 239

to meet the needs of your users. It is designed to handle thousands of simultaneous users and millions of transactions per day. This is more than adequate for average and large size corporations. There is a version of the ILS that runs on a DEC Alpha if you have a workstation that uses the DEC processor.

As a first step, you should ensure that IIS is functioning properly and that a Domain Name Server entry has been added for the computer on which you will install the ILS. The naming convention for ILS servers is *ils.domain.com*, so if your domain is *widgets.com*, you should use the host name *ils.widgets.com*. Your server must have a static IP address that can map to this host name so that NetMeeting users will always have a static place to meet. Check the operation of Internet Information Server by running a Web browser such as Internet Explorer, and type in the address of your server. You should get a Web page from your server. If not, see the IIS troubleshooting guide. IIS must be running before you can install the ILS.

TIP

The ILS server is included with the enclosed CD.

You can get the ILS software in two ways: from Microsoft's Web site or on the CD-ROM that is included with this book. In either case, the installation is the same, except that you install one from your hard disk and the other from a CD-ROM. The location for downloading ILS is http://www.microsoft.com/netmeeting/ils. The ILS is part of the Microsoft Commercial Internet System (MCIS), which is part of the BackOffice-Live family.

NOTE

You can find more information about the Microsoft Commercial Internet System at http://www.backoffice.microsoft.com.

If you have IIS working on your Windows NT Server and have a copy of ILS, you are ready to proceed with the installation. Log on as the administrator and close all applications. Run the ILS installation program from the Microsoft Web site or the SETUP program on your CD-ROM. The screen shown in Figure 13-1 will be displayed during the first stage of the installation.

SAMSUNG EXHIBIT 1017, Page 240

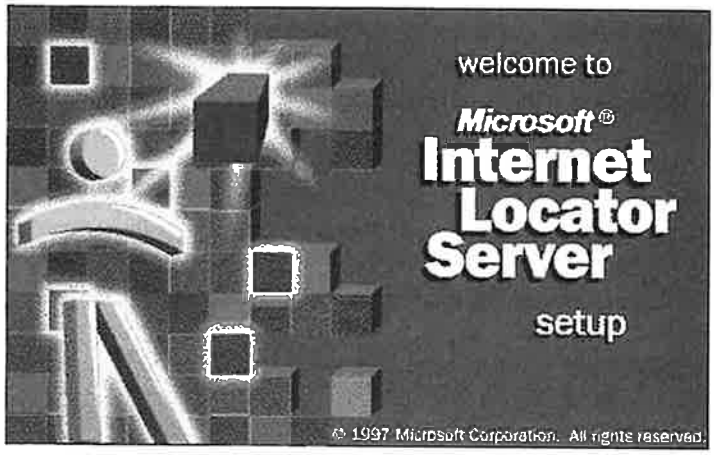


Figure 13-1. *The welcome screen for the ILS installation program.*

You will be presented with several installation screens, including the license, registration, and installation directory. In most cases, the defaults are sufficient. ILS attempts to install itself with your IIS. Three components are installed: ILS Service, sample HTM and ASP files, and ILS documentation. You can select not to install the last two components, but I highly recommend installing them. During the installation, you also are prompted to stop the other Internet services. You must select Yes for the ILS setup to continue.

> **CAUTION**
>
> While you install ILS, all Internet services, including the Web server, will be stopped on that server. These services will restart when the installation process is complete.

The ILS requires the *Active Server Pages (ASP)* script processor to create HTML pages. ASP is installed with IIS 3.0 or later. You will receive a warning during installation if the ASP script processor is not found. Your final installation step will be to select post-installation options. The ILS installation program can automatically run the administration tool and the ILS Startup page when it is complete. I recommend selecting both of these options.

Administering the ILS service is straightforward and part of the Internet Administration tool that you use for IIS. You will use the Internet Service Manager (ISM) to administer the ILS server. It is integrated into the same tool so that it is easy to make changes locally or remotely. The ILS Start Page is an HTML

SAMSUNG EXHIBIT 1017, Page 241

document with some good links for testing and learning about your new ILS server. A link to this page, the ILS Service Start Page, is created in the Microsoft Internet Locator Server program group, located under the Windows NT Server Start menu. Do some exploring and see what this page has to offer. You will especially want to check out the Verify Installation pages, because these will verify whether you have successfully installed the ILS server.

Now that you have installed the server, I will look at some of the ILS's benefits and configuration options. It will function right out of the box if you do not want to make any security changes. Most users will not need to make any changes. You should be able to run NetMeeting and tell it that the directory server is the host address of your server. Remember to change the default login directory server in the NetMeeting Properties dialog to indicate your server. A user is listed only if you log him or her into the server and allow his or her name to be listed.

Comparing ILS and ULS

You may have noticed that every piece of software has an acronym, and a whole set of acronyms describe how the software talks and operates. This is not meant to confuse you, but in the case of ILS versus ULS, it may be a bit confusing. If you are relatively new to NetMeeting, you may never have heard of ULS and may wonder what the references to ULS and screens of the ILS configuration are throughout the documentation. User Location Service (ULS) was the server software used for NetMeeting version 1.0. This software used the *User Location Protocol (ULP)* to exchange directory information between NetMeeting and the server. ULS is no longer supported as a separate product, but the ULP protocol (the guts of ULS) is part of the ILS server for backward compatibility. In the future, ILS will not support ULP.

The ILS can talk to the world in three ways: HTTP, ULP, and LDAP. HTTP occurs through HTML pages using the IIS ASP scripting engine. You can easily generate a list, in HTML format, of all the current users or a subset of those users. You can find out how to do this by reading the *ILS Web Publishers Guide* that is included with the installation of the ILS. ULP is included only for backward compatibility with NetMeeting version 1.0. LDAP is the standard for network directory services.

LDAP and ILS

NetMeeting communicates with the ILS using the Lightweight Directory Access Protocol (LDAP) version 2. This protocol is a standard method for network clients (such as NetMeeting) to access and query user information stored on a central server using TCP/IP. Actually, the information can be of any type,

SAMSUNG EXHIBIT 1017, Page 242

but when LDAP is used with NetMeeting, the information that is stored on the server pertains to various aspects of a user's configuration and network location. LDAP communicates an electronic directory to NetMeeting, just as a phone book gives you a directory of people in your area that you can call with your telephone.

The use of standards have been explained throughout this book for every component of the NetMeeting architecture. The ILS follows the same standards as NetMeeting and thus has adopted the industry standard LDAP directory services protocol. Standards are important for interoperability and integration with other components of the system.

NetMeeting sends two types of dynamic objects to the ILS for registration: User and MeetingPlace. The User object holds information about an individual user, such as the user's name, location, and IP address. MeetingPlace is an object for an ongoing conference and holds information such as attendee and description. It is the ILS's responsibility to keep track of these objects and it is NetMeeting's responsibility to use LDAP to communicate changes in these objects.

> **NOTE**
>
> You can use the ILS for applications other than NetMeeting. In fact, the conferencing SDK contains development tools for connecting your applications to the ILS. This enables the developer to take advantage of this powerful dynamic database.

NetMeeting communicates six basic operations to the ILS through LDAP: Registration, Unregistration, Refresh, Resolve, Enumeration/Query, and Modify. These are the basic operations that allow the ILS to keep its memory database of User and MeetingPlace objects up-to-date. There are some problems with the LDAP version 2, relating to the dynamic nature of NetMeeting calls and the lifetime of an object on the server, but these are being resolved in version 3 of LDAP and will be incorporated into NetMeeting as it evolves.

Performance Improvements

When you install the ILS on your local server, you will notice better performance with NetMeeting than when you use any of the publicly accessible servers. There are a couple of reasons for this. If you run the ILS on your corporate network, you have complete control over the network architecture and network bottlenecks. In most cases, a corporate network will be a lot more efficient than the Internet. You have to remember that the Internet is a combination of many

SAMSUNG EXHIBIT 1017, Page 243

networks and was not designed for speed and efficiency. Many messages sent between NetMeeting and the ILS server must be carried on the network, so it should be obvious that a more efficient network, such as your corporate LAN, will perform better than the less-efficient Internet.

Many of the public directory servers, especially the Microsoft servers, receive millions of hits per day. This can decrease the response time when you are logging in or getting directory lists. By using your own server, you gain complete control over who can use it and how many users you allow on the server at one time. You can even configure the server to limit the number of kilobytes per second that are transferred. See the section in this chapter on configuring the server for more information.

One of the greatest benefits of running your own ILS server is control. You have control of the server hardware and the server software, which means that if the server goes down, you can restore it. You do not have to depend on another service or company to provide this vital component. Control gives you many options, such as security, that are not available on the public ILS servers.

Security Enhancements

When you are in charge of running a corporate network, security is always on your mind. It is important to know who accesses available resources within the LAN or on the Internet and how they access them . You will also want to know how running an ILS will affect your firewall. See Chapter 11, "Configuring Corporate Firewalls," for more information.

A number of security features are available to you and the ILS, one of which is physical security. When you started the ILS on your corporate LAN, you automatically blocked off most of the users on the Internet. Even if your LAN does not have a firewall, by creating your own community, the security has increased. Unless you publish the address of your new ILS, most people will not know that it is there. This doesn't mean that you don't need a firewall for protection; it just means you have decreased the likelihood that unwanted Internet users will contact the users of your ILS.

Besides physical security, the ILS has two different types of user authentication: Anonymous and Windows NT Challenge/Response. Anonymous authentication enables any user to connect to the server as an unknown user. These users are logged in with the Windows NT Anonymous account that is created when you install IIS. If you choose to use Windows NT Challenge/Response, you will have to configure an account with the Windows NT User Manager for each user to whom you want to give access to the ILS server. This is one of the most restrictive methods that you can use with the ILS. I will go through how to configure these options in the next section.

SAMSUNG EXHIBIT 1017, Page 244

The ILS has one more security feature. You can selectively deny and grant ILS service access to any individual or group of IP addresses. This is a great feature if you want to allow access only to those people on your network. This feature will be described in detail in the configuration section of this chapter.

The Conferencing Server

The ILS is part of a bigger server product line that Microsoft has rolled out, called the Microsoft Commercial Internet System (MCIS), which is designed to make it easy for Internet Service Providers (ISPs), Internet Content Providers (ICPs), and corporations to build interactive live communities on the Internet or intranet. The MCIS has nine components. They are all designed to be highly scalable, have a common administration/installation interface, and are built on the Active Server platform: Address Book, Chat, Content Replication, Internet Locator (ILS), MCIS Mail, MCIS News, Membership, Merchant, and Personalization. A brief description of each component follows:

- **Address Book.** Static database that offers "White Pages" services to users and can contain email addresses, chat channels, and new groups for your community. Closely related to the ILS but used more for static information.
- **Chat.** Multipoint chat server that enables real-time exchange of one-to-one, one-to-many, and many-to-many text data. Complete interoperability with IRC servers and clients.
- **Content Replication.** Enables the secure transmission of large amounts of data through a firewall and onto a Web server. Also supports sending files to one or more multiple destination servers.
- **Internet Locator.** Provides live user directories using the LDAP protocol. NetMeeting can be configured to use this server to help connect users together.
- **MCIS Mail.** Internet mail server that supports SMTP and POP3 mail products.
- **MCIS News.** Internet news server using standard NNTP. Enables you to easily set up a public message area for your users.
- **Membership.** Provides user authentication and generates billing events based on the area that a user enters on the Internet Server.
- **Merchant.** Online store server that makes it easy to sell your products online.

SAMSUNG EXHIBIT 1017, Page 245

- **Personalization.** Helps provide a personal interface to the Web site by adding components that enable end users to customize their Web interface.

> **NOTE**
>
> This list is meant to give you an idea of the other components in the ILS family. Check http://www.backoffice.microsoft.com/product/cis/system.asp for more detailed information.

The Free ILS

What is the price of the ILS and MCIS components? The ILS software is available at no charge to download from the Internet. The other components of the MCIS can be downloaded for trial usage and their pricing varies. Check the Web reference earlier in this chapter for more information about the pricing of the other MCIS components.

CONFIGURING YOUR ILS

The ILS configuration is designed to be the same as all of the other Internet services that are running on your NT Server. The ILS is configured by modifying the LDAP service in the Internet Service Manager (ISM). The ISM is used to administer all of the services that relate to the Internet, including WWW, FTP, GOPHER, and now LDAP. There are other services, such as Microsoft NetShow and Proxy, that are also administered through the ISM. If you have administered your Web server before, this will be easy for you. If haven't, it should still be relatively easy. These components are designed to be easy to configure, maintain, and operate. (Now if you could only remember what all the acronyms mean, you will be golden.)

> **TIP**
>
> Appendix A, the glossary, contains an alphabetical list and definition of all acronyms and terms used in this book. If you forget what an acronym means, turn to the glossary as a quick reference.

SAMSUNG EXHIBIT 1017, Page 246

To configure the ILS, you need administrator privileges for the computer that you will be setting up. With the Internet Service Manager, you can do all of these operations from a remote Windows NT computer, but you must have administrator rights. Log on and load the ISM, which has its own group on the Start menu. Select the computer that you want to administer (there may only be one) and select the LDAP protocol. Figure 13-2 shows the ISM with LDAP, WWW, and FTP services installed and running.

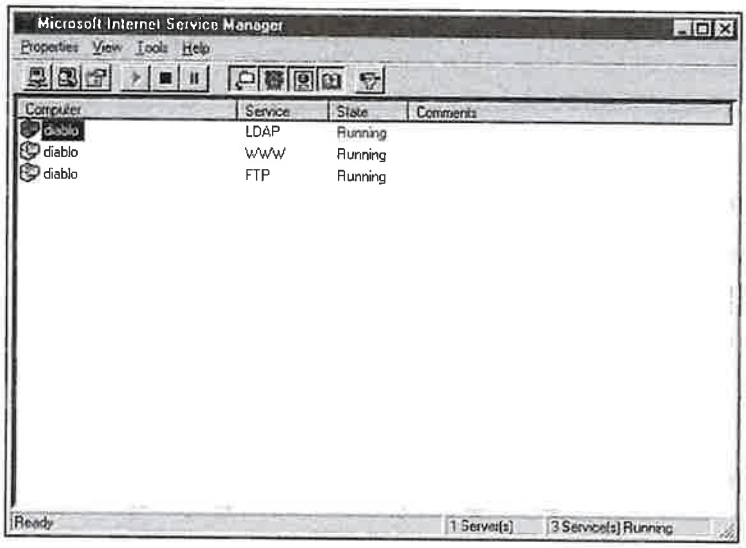


Figure 13-2. *You can access the LDAP service through the Internet Service Manager (ISM).*

You can now manually stop and start the LDAP service by using the pause and play buttons on the toolbar. The LDAP service automatically starts when Windows NT Server loads. Click Service Properties. You will see the window shown in Figure 13-3.

The Service tab should show you the current base configuration for the ILS server. Connection Timeout refers to the number of seconds that the service will wait until a connection is completed. When a NetMeeting client connects to the server, it may take some time for the connection to be fully established. This timeout value indicates how long the server waits until it gives up.

You can specify the maximum number of simultaneous users that you will allow online at one time with the second option. This option is a great way to limit the ILS server usage if it takes up a lot of your processor. By lowering this number, you can decrease the total possible number of users who may have LDAP transactions going on and thus lower the processor use of the ILS. You

SAMSUNG EXHIBIT 1017, Page 247

should not have to lower this initially, but if you begin to experience problems when the server load gets high, this is the first option to consider.

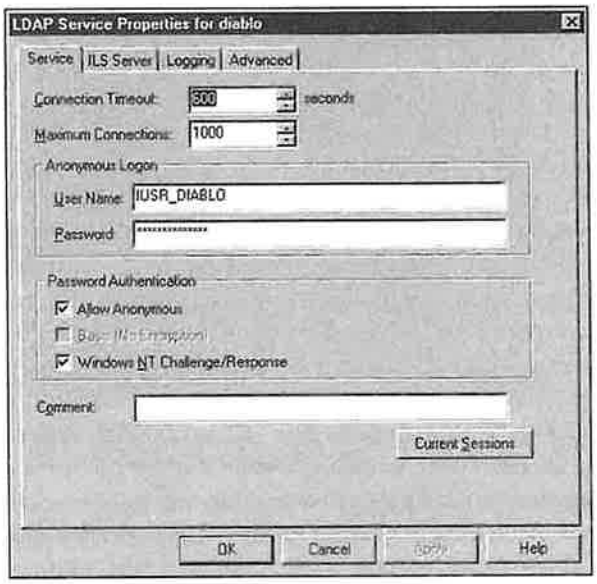


Figure 13-3. *The LDAP Service Properties main window shows the basic configuration for the ILS.*

If you allow for Anonymous logon, Windows NT must apply a set of policies to the user who is accessing the ILS. Anonymous logon is typically used for Internet services because, in most cases, you really don't care who is connecting to the server, you just want to make sure that the user can only access the public resources that you are providing. The Anonymous Logon User Name specifies the user name that is used when applying security. Typically, this name should be in the form *IUSR_machinename,* in which *machinename* is the name of the computer. This account is created automatically when IIS is installed. The password is not really used but is set to *password* by default.

The last set of options in the LDAP Service Properties tab is Password Authentication. You can choose not to use Anonymous connections to the ILS and configure an account for every user to whom you want to grant server access. This is the tightest security method for the ILS and may add to your maintenance, but at the same time it will make the ILS server very tight. Check Allow Anonymous to allow anonymous types of connections and Windows NT Challenge/Response to enable user name and password authentication. You must have the MCIS Membership server installed to use the last option. See http://www.backoffice.microsoft.com/product/membership/system.asp for more details.

SAMSUNG EXHIBIT 1017, Page 248

The second tab is the ILS Server specific configuration, as illustrated in Figure 13-4. With this tab, you can enable or disable the ILS server, set the client refresh rate, set the maximum number of users, and toggle ULP. To disable the ILS server, uncheck the Enable ILS Server check box. The Client Time To Live setting determines the number of minutes that a database entry can remain in the list without being refreshed, preventing the records from getting "stale" and the listing from degrading too rapidly.

Though you are not aware of it, NetMeeting checks itself into the ILS server every once in a while, using the Refresh function of the LDAP protocol. If the server does not get a refresh in the given time, the record is automatically deleted from the list.

You can configure the transaction logging that takes place on your ILS with the third tab on the LDAP Service Properties dialog box, as shown in Figure 13-5.

This configuration is straightforward. You can control whether logging is enabled or disabled and how often a new log is created. Creating a new log file on a periodic basis can help you manage and archive old log files. It is a convenient filing system for keeping track of old events. At some point, you will want to erase your old logs because they can take up a lot of space. Select an option to create a new log file either daily, weekly, monthly, or when the file reaches a certain file size. Keep in mind that creating a new log daily can result in a lot of files over time, and choosing the monthly option can result in very large files if your ILS gets a lot of traffic. You may have to search through the logs at some point to find a problem or check for an access record. Last, select the directory in which to store the files. With the Browse button, you can use a common directory listing dialog box to select the directory. The default directory for all Windows NT log files is C:\WINNT\SYSTEM32\LOGFILES.

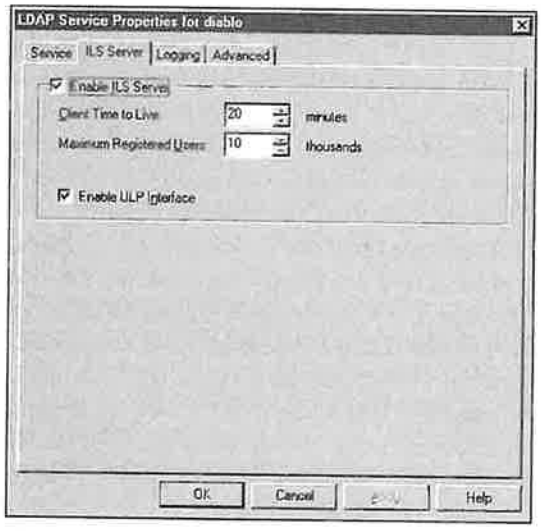


Figure 13-4. *The second tab is the ILS Server specific configuration.*

SAMSUNG EXHIBIT 1017, Page 249

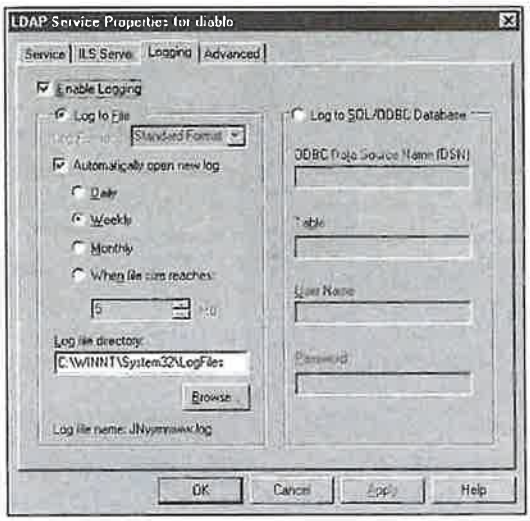


Figure 13-5. *Logging ILS transactions can be configured on the third tab of the LDAP Service Properties dialog.*

If you want the transactions to be logged to an installed SQL or Open DataBase Connectivity (ODBC) database, you can enable that option. Any Access database is an ODBC database. Logging transactions to a database enables you to do analysis on the transaction logs.

> **TIP**
>
> The format of the log file is separated by commas, so you can easily import the file into most applications for later analysis.

> **CAUTION**
>
> Using an ODBC database to store the ILS transactions creates more overhead for your server and should only be used on servers with little traffic or with adequate CPU capabilities.

On the Advanced tab of the LDAP Service Properties window, you will find additional security and network access options for the ILS. Figure 13-6 shows the Advanced tab options.

SAMSUNG EXHIBIT 1017, Page 250

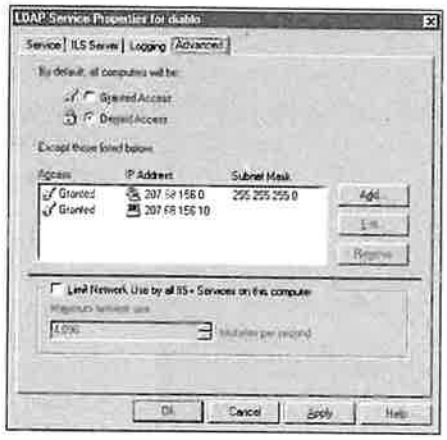


Figure 13-6. *Advanced tab of the LDAP Service Properties window.*

The Advanced settings allow for the more specific security features of the ILS to be configured.

You can set up groups or individual IP addresses to grant or deny access to the ILS. This sounds great if you want to keep an individual off your ILS, but it may not be that easy. If the computer that you are trying to deny access to has a dynamic IP address, simply entering the IP address of that person won't work. The only way to ensure that the individual does not get on is to deny access to the entire IP Class.

There are three classes of networks, A, B, and C; a class A network is the largest and a class C network is the smallest. An average size business is assigned one or more class C addresses for their network. Let's say hypothetically that Microsoft is an average size business and is assigned the class C address of 207.68.156 (actually Microsoft has many network addresses). This is not a full IP address because it is missing the fourth digit; to make the address complete, add a node number from 1 to 254. Let's say that you want to grant access to your ILS only to members from the Microsoft network using the example address just mentioned. Select Grant Access and then click Add. The dialog box in Figure 13-7 shows the correct information to create this new security item.

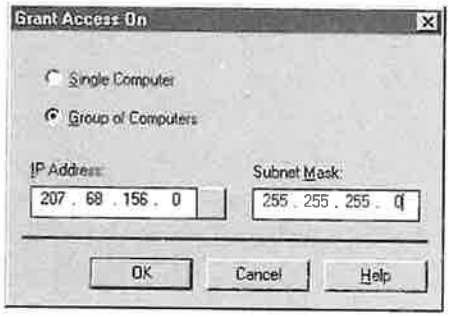


Figure 13-7. *Granting ILS access to a group of computers.*

SAMSUNG EXHIBIT 1017, Page 251

As you can see, you selected Group of Computers and entered the class C address 207.68.156.0 and a Subnet Mask of 255.255.255.0. The Subnet Mask selects the first three numbers of the address entered into the IP Address window. If you had placed 255.255.0.0 into the Subnet Mask window, you would grant access to the class B network 207.68, which would also include the Class C network 207.68.156. This may be a little confusing at first, but if you experiment with this option, it will become clear. Press OK to add the new item to your **security list.**

If you want to give access to only one computer in the network, select Grant **Access on the** Advanced tab and click Add. The dialog box in Figure 13-8 shows the option of granting access to a single computer.

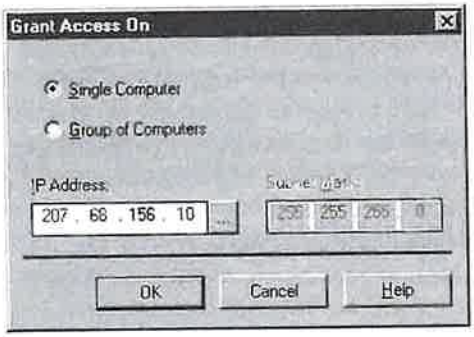


Figure 13-8. *Granting access to a single computer.*

This option is a lot easier than the group access option because it does not involve using the Subnet Mask information, which can be confusing. Select Single Computer and type in the full IP address of the computer to which you want to give access to the ILS. If your users have dynamic IP addressing, granting individual access won't work properly. The user must have a static IP address for this to work at all. Press OK and the new security item is added to the list.

To deny access, follow the same procedure that you did to grant access. In this case, you can deny ILS server access to an individual or group. Remember that denying access to an individual IP address may not work if the user has dynamic IP addressing.

The last option on the Advanced tab relates to all running IIS services, including WWW, FTP, GOPHER, LDAP, and any other IIS service. You can limit the total amount of data transmitted by these services by selecting this option and setting a kilobyte per second value. If you are concerned that these services are using too much of your network resources, you can enable this option to effectively place a governor on the amount of data transmission.

SAMSUNG EXHIBIT 1017, Page 252

> **CAUTION**
>
> Enabling the Limit Network Use option affects *all* of the Internet Information Server services, not just the LDAP service. Use caution when enabling this option.

ADMINISTERING YOUR ILS

Once the server is running, administration is easy because this is a low-maintenance application. If you are using Windows NT Challenge/Response authentication, you will have more work to do than if you use Anonymous authentication, because you will have to administer all of the accounts that are going to access the ILS. When logging is enabled, you will need to keep an eye on how much space the transaction logs are taking up because the size can grow very quickly, especially when you have a lot of traffic on your ILS. You may occasionally need to review the logs if there is any type of problem.

Most administration capabilities are contained in the Internet Service Manager, but the ILS can also be configured using the command line INETCFG utility. The ISM provides a mechanism for manually starting and stopping the LDAP service, which represents the ILS, by selecting LDAP and pressing the Start or Stop service buttons on the toolbar. Also provided is the entry point to the LDAP service properties, which are explained in detail in the previous section. Part of administration may be to change some of the options, so refer to that section if you need help configuring the LDAP Service Properties.

Unauthorized Users on Your ILS

If unauthorized users access your ILS, you have a security problem that you can solve with several different methods. First, determine how this user was able to access the ILS. Did he or she come from the Internet or from within your own corporate network? In most cases, unauthorized access is due to the ILS's loose security configuration. If users are getting unauthorized access from the Internet, you may need to check the settings on your firewall. If you do not have a firewall, you should consider setting the Grant Access options on the Advanced tab of the LDAP Service Properties window. See the section on this option earlier in this chapter.

You can also interactively disconnect a user who is logged on the LDAP User Session window. Log on as the administrator and run the Internet Service Manager. Select the LDAP Service Properties. Click the Current Sessions button on the Service tab. The dialog box shown in Figure 13-9 will be displayed.

SAMSUNG EXHIBIT 1017, Page 253

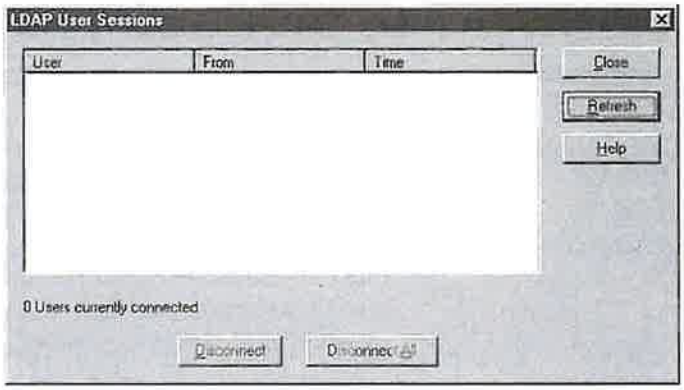


Figure 13-9. *Viewing the LDAP users that are currently active.*

This dialog box enables you to disconnect a single user or all users who are connected. Select the user and press the Disconnect button to remove the unwanted user from the ILS listing. You may need to press the Refresh button to get the most current listing of users who are online. This is only a temporary solution, however, because if the user logged on before, he or she can log on again. You may want to consider using the NT Challenge/Response method if you need tighter security.

Logs and Tracking

One feature of every service is the capability to create entries in the Windows NT event logs. In addition to adding events to the system logs, the ILS has the capability to create its own logs that record every transaction that takes place. You must enable the logging in the LDAP Services Properties for transaction logging to take place. Review the section on configuring the ILS for more information. The transaction logs can be a powerful mechanism for tracking user problems and getting usage information. The ILS also uses the Windows NT counters for real-time performance and activity readings.

If the service fails to load for any reason or if it starts as expected, an event will be added to the Windows NT event list. You can view that event with the Event Viewer. Otherwise, all transactions, if logging is enabled, are stored in text format with each value separated by commas.

NOTE

In ULP, the protocol used for NetMeeting 1.0, transactions are not logged to the transaction log.

SAMSUNG EXHIBIT 1017, Page 254

Table 13-1 lists all the values that are stored into the tracking log.

Value Name	*Description*
Client IP address	Internet address in dotted decimal format of the user connecting to the ILS (for example, 206.30.214.255).
Client distinguished name	Client name of the user connecting to the ILS (for example, cn=terry, o=boonsville, c=us).
Connect date	Date on which the transaction took place.
Connect time	Time at which the transaction took place.
Service name	The service that made the transaction entry; in this case, LDAP.
Server machine name	Name of the server running the ILS.
Server IP address	IP address of the server running the ILS.
Processing time	Amount of time in milliseconds that the server spent processing this transaction.
Size of query	Number of bytes the client software sent during the connection associated with the transaction entry.
Size of result	Size in bytes of the response to the query.
Number of results	The number of entries sent in the response as a result of a query.
Service status or error code	An error code, if there was an error generated during the query. Otherwise a Win32-specific status.
Name of the operation	The command being issued (for example: create).

Table 13-1. *ILS Tracking Values.*

Knowing these field values may help you troubleshoot or analyze your ILS. You must realize that the transaction file grows quickly because every transaction is recorded into the log file. Remember to erase or back up the old log files.

You also may choose to place these entries into an ODBC database. Keep in mind that this generates more system overhead and can slow the performance of your server. You need to know the data source name, table name, user name, and password for the corresponding ODBC database to configure that option. See the configuration section of this chapter for more details.

SAMSUNG EXHIBIT 1017, Page 255

Performance Monitors

Any software or service written for Windows NT contains hooks into the performance meter of Windows NT. The ILS is no different. These hooks give you a mechanism for monitoring most aspects of the ILS. You can check various indicators of the ILS, including the number of directory searches per second, the number of user information refreshes, queue length, and number of current connections. A spike in the number of logons can indicate a possible security problem.

Additional ILS Information

Three documents come with the ILS and are installed when you set up the ILS. Most of this documentation has additional detailed technical information about the architecture and operation. You may need to refer to these documents for more detailed explanations:

ILS Operations Guide

ILS Operations Reference

ILS Web Authors Guide

FROM HERE...

In this chapter, we have configured an ILS to create a virtual meeting place on your network. You may choose to make this accessible to the Internet or only accessible to your private network users.

For more information regarding NetMeeting and your network, see the following chapters:

- Chapter 10, "Considering Security," covers the security issues that you should be aware of when using NetMeeting on the Internet.
- Chapter 12, "NetMeeting as Part of Your Network," discusses how you can use NetMeeting to enhance your network and help your network users take advantage of this new tool.

SAMSUNG EXHIBIT 1017, Page 256

Chapter 14

Programming the NetMeeting SDK

In this chapter, you will learn:

- **ActiveX—What is it?** ActiveX provides an object-oriented method of creating applications for the Internet and Intranet. I'll show you how you can use the ActiveX component of the NetMeeting SDK.
- **Conference objects.** The conference objects make up functionality of the NetMeeting ActiveX control. In this section, I will go through the properties and events of these objects.
- **The Conference Manager object.** Most of the features of the SDK are contained in the Conference Manager object. We'll look at the details of this central component.
- **An HTML conferencing example.** I have provided a conferencing example in HTML using VBScript for you to learn quickly.

This chapter will take you on a journey through the ActiveX portion of the NetMeeting Software Development Kit (SDK). I'll show you the basics of adding conferencing capabilities to your applications with this valuable new tool. This chapter is not meant for the first-time programmer, although it also does not require that you have expert programming experience. It is designed to give

SAMSUNG EXHIBIT 1017, Page 258

you basic information about the SDK and show you how to implement some of its basic functions.

INTRODUCTION TO ACTIVEX

What is ActiveX, anyway? ActiveX is a collection of network development tools and objects for the Internet and intranets. Many of you probably know that it is just another incarnation of *OLE (Object Linking and Embedding)*, but that might not mean a whole lot to the rest of you. You most likely just want to know what it can do for you and how it can help you develop applications.

Microsoft designed ActiveX to add powerful object capabilities to the Internet and intranets. The core of ActiveX is the ActiveX control, which is a small object that enables programmatic control of any feature that your computer has to offer. In this case, you can use ActiveX to add conferencing features to your applications. One of ActiveX's requirements is that these controls are small so that you can quickly transmit them on a network and easily distribute them.

Some of you may believe that ActiveX is a lot more than merely a control—it is a way of thinking and linking the network together. This may be true, but the scope of this book and chapter does not allow me to go into the vast details of ActiveX. This book could ponder the details of the *COM (Common Object Model)* layer and the relationships between client and server, but this information can, and already does, fill volumes.

The basics are explained here—just enough for you to get ActiveX working and to understand what is going on.

> **TIP**
>
> There is a wealth of information about ActiveX on Microsoft's Web site and all around the Internet. If this interests you, take a look. I did a search for "activeX" on a popular Internet search engine and it yielded more than 30,000 references, so there is plenty to look through.

Understanding the NetMeeting ActiveX Control

The NetMeeting SDK, an extension of NetMeeting, provides an interface for programmers and Web developers to integrate conferencing capabilities into their applications and Web sites. Included in the NetMeeting SDK is an ActiveX control that exposes

SAMSUNG EXHIBIT 1017, Page 259

some of the functionality of NetMeeting to the programmer The NetMeeting SDK is available online at no cost and can be accessed on the Microsoft Site at the following address: http://www.microsoft.com/netmeeting/sdk.

If you are looking for a great way to add every NetMeeting feature and have full control over those features, be prepared to be disappointed. The ActiveX control that comes with the SDK will seem extremely limited if you are a power programmer and like to have control over everything. The novice programmer might find it a little overwhelming because a lot of objects, properties, events, and methods must be managed properly for the conference to work correctly. Don't get me wrong—the more experienced programmer may find some valuable capabilities in the SDK—I am just warning you that it is not going to be everything you want it to be. The following sections will go through the basics of what is offered by the SDK and give examples of how to use it. If you are a power programmer, I suggest you turn to the documentation included with the NetMeeting SDK and skip reading this chapter.

Understanding ActiveX Objects

First, you need to have some background information on what makes up an ActiveX object. Each object has a series of properties, methods, and events. If you have done any programming with Visual Basic or Visual C++, then these should be familiar to you. The properties of an object enable you to set and read attributes of a control. Methods perform certain functions or procedures when you access them, and events are actions that are created or *fired* from within the control. If you are confused, this becomes more clear as you tear each of the objects of the NetMeeting ActiveX control apart in this chapter.

Some objects contain only properties, or just properties and methods. An object does not have to include all three types, though there are only a few rare instances in which a control will not have properties. All objects that are part of the NetMeeting ActiveX control have properties and only one object, the Conference Manager object, has events associated with it.

As you read through these object definitions, keep in mind that you can always look back for the details of a property, method, or event. These pages don't magically erase after you turn them. There are a lot of details that you do not need to worry about initially. Read through them first and try to understand how each of the objects relate to one another and what NetMeeting will do as a result of the change or action. When looking at events, think about what your program should do when the event happens. Once you have absorbed the basics, you will be on your way to creating your own NetMeeting-based application or Web page.

SAMSUNG EXHIBIT 1017, Page 260

Understanding Conference Objects

When you conference with NetMeeting, you are not aware of everything that is going on behind the scenes. This is good, otherwise using NetMeeting would be too complex for most people. Now that you are going to be a NetMeeting developer, you will learn what is going on behind the scenes. This SDK acts as an interface to the NetMeeting functions. In fact, NetMeeting will always be running when you use any of these functions. The NetMeeting ActiveX control communicates with the NetMeeting objects to accomplish the desired task.

An *object* is a collection of common functions that work together toward some common feature. You might think of an object as a small, simple member of a larger, more complex process that does a portion of the main program's capability. The great thing about an object is that you can use it for many purposes and in multiple instances (in most cases). NetMeeting and conferencing is a pretty complex task, so it is broken into several objects. The purpose of the SDK is to give you easy access to those objects. It is important to note that not all objects of the NetMeeting architecture are going to be available to you. In fact, if you are using the ActiveX control, you will be more limited than if you use the COM Object interface because not all of the functionality of the COM interface is exposed in the ActiveX control. As you would then expect, learning how to use the COM Object interface is more difficult than learning how to use the ActiveX control. The objects that are defined by the NetMeeting SDK are:

- Conference Manager
- User
- Conference
- Member
- Channel
- Client Application
- Sharable Application
- Data Transfer
- File Transfer

The object names immediately give away the nature of their functionality, but understanding how all of them work together is not exactly intuitive. Each object deals with a specific task relating to its name. The most complex of these is the Conference Manager, which is the first object that you must learn to use to manage a conference. I will now outline the details of each of these objects. Later in the chapter (see the section "Conferencing Example") I will present an example in HTML (using VBScript) that uses some of these objects.

SAMSUNG EXHIBIT 1017, Page 261

Before I continue, you should understand the relationships between some of the data members. A user is any potential member of a conference and can be someone who has the NetMeeting software running in the background, listening for a call. A member is an active participant in the current conference. The Channel object manages the transfer of data for file sharing, application sharing, and general data transfer methods. This involves the client application, any sharable application, and data and file transfer objects.

We will cover the Conference Manager and User objects in detail in this chapter. Understanding these two will give you the basic functionality of starting a NetMeeting conference within your application. If you are interested in working with the other objects, you should refer to the SDK documentation. Once you have mastered what is covered in this chapter, using the other objects will be easy.

The example code provided in each section is in Visual Basic. I chose Visual Basic because most developers will use either Visual Basic, VBScript, or Visual Basic for Applications (VBA) to integrate conferencing into their applications. All three follow the same syntax and language structure.

> **NOTE**
>
> Some of the properties and methods that you will never need to use have been left out of this chapter. I have also not included properties and methods that are documented but not yet supported by the SDK.

THE NETMEETING ACTIVEX CONTROL

If you are serious about developing applications that integrate with NetMeeting, you are going to know the NetMeeting ActiveX control well. All the objects that make up the SDK are contained in this control. The NetMeeting ActiveX control, which is installed when you install NetMeeting, is installed in the WINDOWS\SYSTEM folder as XMSCONF.OCX. This file *must* be present for any application using the NetMeeting SDK to function properly.

> **NOTE**
>
> Any user of your application must have NetMeeting installed before your application will work. This includes using the control embedded on a Web page.

SAMSUNG EXHIBIT 1017, Page 262

The Conference Manager Object

The main object of this SDK is the Conference Manager object, which is the first and last object that you must use. At the center of the NetMeeting architecture is the Conference Manager. The Conference Manager object of the SDK gives you access to the conference management component of NetMeeting. You use the *Initialize* method of this object first. This method loads the Conference Manger and NetMeeting. When NetMeeting loads, it will be part of the task bar, not full screen. All events fired by the NetMeeting ActiveX control are sent through the Conference Manager object.

The Conference Manager object has the following properties:

- *ConferenceCapabilities*
- *RemoteConference*
- *Conferences*

I will now cover the details of these properties. In the examples, the *ConfMgr* represents the Conference Manager object. These examples are meant to show you the usage of each property and are in no way functional by themselves.

The ConferenceCapabilities Property

This property returns the conference data types that are available on the local machine. The value that is returned is a bitmask of any of the constants in Table 14-1.

Constant Name	*Value*	*Description*
CNF_CAPS_NONE	0	No conferencing capability
CNF_CAPS_DATA	1	Data-conferencing capable
CNF_CAPS_AUDIO	2	Audio-conferencing capable
CNF_CAPS_VIDEO	4	Video-conferencing capable

Table 14-1. *ConferenceCapabilities values.*

For example:

```
LocalCapability = ConfMgr.ConferenceCapabilities
```

In this example, the variable *LocalCapability* will equal *CNF_CAPS_DATA* + *CNF_CAPS_AUDIO* + *CNF_CAPS_VIDEO* = 7, if the local machine has the ability to conference every data type available.

The RemoteConference Property

This property retrieves the Conference object for the conference which activated an application. You will need to save and use this object when you want to communicate with the remote node that activated the application.

SAMSUNG EXHIBIT 1017, Page 263

For example:

```
RemoteConf = ConfMgr.RemoteConference
```

The *RemoteConf* conference object type is set to the current RemoteConference object.

The Conferences Property

This property returns a list of current, ongoing conference objects. This is a good property to call when you need to check whether an active conference is currently going on. It will return a null value if there are no active conferences. You can also use it to enumerate the current conferences and join a specific conference.

For example:

```
If ConfMgr.Conferences is Nothing then
    ' There are no active conferences
end if
```

In this example, you check whether the conferences object is equal to *Nothing*, which, in Visual Basic, means that the object is null or empty. In this case, *Nothing* means that there are no active conferences, so you may want to create or join a conference.

The Initialize Method

This must be the first method you call before using any other part of the SDK because it registers your application with the Conference Manager object's conference services. You must retrieve what is known as a globally unique identifier (GUID) for your application before you can perform this method.

For example:

```
ConfMgr.Initialize AppID
```

Here, *AppID* is the string representation of the GUID.

The Uninitialize Method

Call this method last when you unload your application. This method, the inverse of *Initialize*, frees all the application resources the SDK has taken.

For example:

```
ConfMgr.Uninitialize
```

This syntax unloads the resources and memory the control uses and must be called before your application terminates, or you may experience unstable results.

The CreateConference Method

Before you can do anything, you have to create a conference. The conference is the place where users get together and exchange data through channels. To create a channel, you must name the channel and specify the capabilities for the new conference. Even if the local machine has all of the capabilities listed

SAMSUNG EXHIBIT 1017, Page 264

below, you may want to create a conference that only has one of them. Use the *ConferenceCapabilities* property of the Conference Manager object to get the capabilities of the local machine. Table 14-2 shows the constants for defining the type of conference to be created.

Constant Name	*Value*	*Description*
CNF_CAPS_NONE	0	No conferencing capability
CNF_CAPS_DATA	1	Data-conferencing capable
CNF_CAPS_AUDIO	2	Audio-conferencing capable
CNF_CAPS_VIDEO	4	Video-conferencing capable

Table 14-2. *Conference Capability values.*

For example:

```
Dim NewConference As IConferenceX
NewConference = ConfMgr.CreateConference("Bob's Conference",
CNF_CAPS_AUDIO)
```

With this syntax, you have just created a new conference named "Bob's Conference," which has only the audio channel capability enabled. Users who join this conference will only be able to use NetMeeting's audio features.

The CreateUser Method

You must create a user object with the appropriate name and type of connection (the user name constants are shown in Table 14-3) before you can request that user to join you in a conference. In most cases, you will have this information in a text box that enables the users of your application to specify to whom they want to connect.

Constant Name	*Value*	*Capability*
CNF_USER_UNKNOWN	0	Unknown user name type; let NetMeeting figure it out by checking the format of the text name.
CNF_USER_IP	1	User name is an IP address.
CNF_USER_MACHINENAME	2	User name is a machine name.
CNF_USER_PSTN	3	User name is a phone number.

Table 14-3. *User Name type.*

SAMSUNG EXHIBIT 1017, Page 265

For example:

```
Dim User As IConfUserX
Set User = ConfMgr.CreateUser("206.30.214.1", CNF_USER_IP)
```

With this example you create a user who is located at the specified IP address. You can use the *Invite* method of the Conference object to invite this user to your conference.

The Advise Method

The *Advise* method enables the events that are sent to the Conference Manager. To use any features that use the events, you will have to call this method. In most cases, you should call this method after you call the *Initialize* method.

For example:

```
ConfMgr.Advise
```

The Unadvise Method

The *Unadvise* method, which is the inverse of *Advise*, disables the events from being sent to the Conference Manager.

For example:

```
ConfMgr.Unadvise
```

The ConferenceCreated Event

This event comes from the Conference Manager and is fired when another application creates a new conference. Remember that other applications can also talk with the Conference Manager object. This hook captures the conference that was created. There is one parameter to this event, as shown in Table 14-4.

Parameter Name	*Description*
pConference	New conference object instance

Table 14-4. *Parameter to ConferenceCreated Event.*

For example:

```
Global  NewConference As IConferenceX
Private Sub ConfMgr_ConferenceCreated(ByVal pConference As
IConferenceX)
    Set NewConference = IConfernceX
    NewConference.Advise

End Sub
```


SAMSUNG EXHIBIT 1017, Page 266

This example sets the globally defined *NewConference* to the newly created Conference object and turns on event advisements for that object. You could also display something on the screen to indicate that a new conference has been created.

The StateChanged Event

This event is fired from the Conference object, which represents a particular conference. Table 14-5 shows the parameters that are passed to this event.

Parameter Name	*Description*
pConference	The Conference object that has had a state change
lConfState	The new state of the conference
hResult	Result of the state change

Table 14-5. *Parameters to StateChanged event.*

For example:

```
Private Sub ConfMgr_StateChanged(
    ByVal pConference As IConferenceX,
    ByVal lConfState As Long,
    ByVal hResult As Long)

    Select Case lConfState
        Case CNF_STATE_IDLE
            State.text = "Conference is idle."
        Case CNF_STATE_INIT
            State.text = "Conference is initialized."
        Case CNF_STATE_START
            State.text = "Conference has started."
        Case CNF_STATE_STOP
            State.text = "Conference has stopped."
        Case CNF_STATE_OFFERED
            State.text = "Conference has been offered."
    End Select
End Sub
```

This example shows all possible states and changes the message in the State text box. You may want to take action during these state changes. Most developers will want to add additional code during the start and stop state changes.

The MemberChanged Event

This event, fired from the Conference object, is a result of someone joining or leaving the conference. In most cases you will want to keep track of who is in

SAMSUNG EXHIBIT 1017, Page 267

the conference. The *MemberChanged* event is excellent to help you track and manage users who are in the conference. A Member object is passed, pointing to the user who is either leaving or joining. If a member's information changes, this event is also fired to indicate the new user information. Table 14-6 shows the parameters passed to this event.

Parameter Name	*Description*
pConference	The Conference object in which a member has changed
pMember	The Member object representing the user who is joining or leaving
lNotify	Indicates whether *pMember* is joining, leaving, or being updated

Table 14-6. *Parameters to MemberChanged event.*

For example:

```
Private Sub ConfMgr_MemberChanged(
    ByVal pConference As IConferenceX,
    ByVal pMember As IConfMemberX,
    ByVal lNotify As Long)

    Select Case lNotify
        Case CNF_MEMB_ADDED
            ' A member has joined the conference
        Case CNF_MEMB_REMOVED
            ' A member has left the conference
        Case CNF_MEMB_UPDATED
            ' A members information as been updated
     End Select
End Sub
```

This demonstrates how you would trap the different type of changes that occur with a member. You can add code to update your own conference member listings. A typical application would use a list box to show the list of members in the conference. You can use this event to update the visible list of users in the confernence.

The DataSent Event

The Channel object fires this event when data has been successfully transmitted. This event actually notifies you that the data has been sent. This event is the result of using the SendData method in the Conference Data Exchange interface.

SAMSUNG EXHIBIT 1017, Page 268

You must enable the advisements for the Data Exchange object for this event to fire. Table 14-7 shows the parameters passed to this event.

Parameter Name	*Description*
pDataExchange	The Data Exchange object that sent the data
pMember	The Member object of those who received the data (NULL if everyone got it)
pDataTransfer	Data Transfer object used in the transmission
hResult	Result of the transfer

Table 14-7. *Parameters to DataSent Event.*

For example:

```
Global TotalBytesSent as Long
Private Sub ConfMgr_DataSent(
    ByVal pDataExchange As IConfDataExchangeX,
    ByVal pMember As IConfMemberX,
    ByVal pDataTransfer As IConfDataTransferX,
    ByVal hr As Long)

    TotalBytesSent = TotalBytesSent +
pDataTranfer.BytesTransferred
    txtSentBytes.Text = TotalBytesSent
End Sub
```

This example keeps track of the total number of bytes transmitted through the data transfer channel and displays the total on the application's interface.

The DataReceived Event

The Channel object fires this event when data is received. You will need to process this incoming data when it arrives.The data buffer that is passed to the event will be freed, so it will no longer be valid when the event routine is finished. Table 14-8 shows the parameters passed to this event.

Parameter Name	*Description*
pDataExchange	The Data Exchange object that took part in the data transfer
pMember	The Member object representing who sent you the data
pDataTransfer	Contains the data that was received
hResult	Result of the transfer

Table 14-8. *Parameters to DataReceived Event.*

SAMSUNG EXHIBIT 1017, Page 269

For example:

```
Private Sub ConfMgr_DataReceived(
    ByVal pDataExchange As IConfDataExchangeX,
    ByVal pMember As IConfMemberX,
    ByVal pDataTransfer As IConfDataTransferX,
    ByVal hResult As Long)

    DataFrom.Text = pMember.Name
    DataSize.Text = pDataTransfer.BytesTransferred
    Data.Text = pDataTransfer.String
End Sub
```

This example displays all the information and the data on the application. This example shows the data in string format, but you can also access it as an array.

The FileSent Event

The Channel object fires this event when a file has been sent successfully. Table 14-9 shows the parameters passed to this event.

Parameter Name	*Description*
pFileExchange	The File Exchange object that was used in the transfer
pMember	The Member object of those who received the file (NULL if everyone got it)
pFileTransfer	The File Transfer object used for the transfer
hResult	The result of the file transfer

Table 14-9. *Parameters to FileSent Event.*

For example:

```
Private Sub ConfMgr_FileSent(
    ByVal pFileExchange As IConfFileExchangeX,
    ByVal pMember As IConfMemberX,
    ByVal pFileTransfer As IConfFileTransferX,
    ByVal hResult As Long)
    FileSentSize.Text = pFileTransfer.BytesTransferred
    FileSentName.Text = pFileTransfer.Name
    FileSentState.Text = pFileTransfer.State
    FileSentTo.Text = pMember.Name
End Sub
```

This example shows the information about the file that was sent, or its current status. It is important to note that you can fire this event multiple times to view the progress of a file that is being sent. This capability is especially helpful when you are sending a large file.

SAMSUNG EXHIBIT 1017, Page 270

The FileReceived Event

The Channel object fires this event when a file is being received. Like the *FileSent* event, you can fire this event multiple times for the same file to receive status information about an ongoing transfer. Table 14-10 shows the parameters passed to this event.

Parameter Name	*Description*
pFileExchange	The File Exchange object used in the transfer
pMember	The Member object of those who sent the file
pFileTransfer	The File Transfer object used for the transfer
hResult	The result of the file transfer

Table 14-10. *Parameters to FileReceived Event.*

For example:

```
Private Sub ConfMgr_FileReceived(
    ByVal pFileExchange As IConfFileExchangeX,
    ByVal pMember As IConfMemberX,
    ByVal pFileTransfer As IConfFileTransferX,
    ByVal hResult As Long)
    FileSentSize.Text = pFileTransfer.BytesTransferred
    FileSentName.Text = pFileTransfer.Name
    FileSentState.Text = pFileTransfer.State
    FileSentTo.Text = pMember.Name
End Sub
```

This example shows the status and information about the file being received.

The User Object

The User object has information about the user who is part of a conference or is a potential member of a conference. You can access the properties of this object to get information about the conference user. The User object has the following properties:

- *Name*
- *Type*
- *ConferenceCapabilities*

The Name Property

This property is the name of the user.

SAMSUNG EXHIBIT 1017, Page 271

The Type Property

This property is the type of user whom this object represents. It may be one of the following constants listed in Table 14-11.

Constant Name	*Value*	*Capability*
CNF_USER_UNKNOWN	0	Unknown user name type; let NetMeeting figure it out by examining the name passed.
CNF_USER_IP	1	User name is an IP address.
CNF_USER_MACHINENAME	2	User name is a machine name.
CNF_USER_PSTN	3	User name is a phone number.

Table 14-11. *User Name Type.*

The ConferenceCapabilities Property

Use the *ConferenceCapabilities* property of the Conference Manager object to get or set the user's capabilities. See the constant names in Table 14-12.

Constant Name	*Value*	*Description*
CNF_CAPS_NONE	0	No conferencing capability
CNF_CAPS_DATA	1	Data-conferencing capable
CNF_CAPS_AUDIO	2	Audio-conferencing capable
CNF_CAPS_VIDEO	4	Video-conferencing capable

Table 14-12. *Conference Capability Values.*

CONFERENCING EXAMPLE

So far, I have only shown you small portions of the SDK. You should have a good idea of what capabilities are provided to you by the NetMeeting ActiveX control. I also included brief examples to show you how to use each of these smaller portions. Now it is time to put it all together and create your first NetMeeting ActiveX control-based application. This section will show you how.

In this case, you will be creating a Web page with the NetMeeting ActiveX control embedding into it using both HTML and VBScript. You can apply the same principals covered in this example to a Visual Basic or Visual Basic for Applications (VBA) application. The example is simple, but will give you the basic idea of how the NetMeeting SDK functions.

SAMSUNG EXHIBIT 1017, Page 272

HTML Using VBScript

In this example, you will write a Web page that uses the NetMeeting ActiveX control. You will need the following:

- A *Window_OnLoad* subprocedure to get things started
- A *Window_OnUnload* subprocedure to clean things up
- A text box to show user names in the conference
- Two buttons, one to join the conference and one to leave the conference
- Procedures for these buttons

Listing 14-1 shows the HTML for the text box, buttons, and procedures. You can use your favorite text editor or use the Microsoft ActiveX Control Pad to create this page. You can also use Microsoft Visual InterDev to create it.

LISTING 14-1. CONF.HTM—BASIC STRUCTURE FOR THE HTML EXAMPLE.

```
<HTML>

<HEAD><TITLE>Sample for NetMeeting ActiveX Control</TITLE></
HEAD>

<!--
    NetMeeting SDK HTML Sample
-->

<BODY>
<CENTER>
    <h1> VBScript Sample for NetMeeting ActiveX Control</h1>

    <p> Just click the Join button below to start the conference
</p>
    <p>
</CENTER>
<BR CLEAR = left>
<CENTER>
    <b>Members </b>
    <PRE><TEXTAREA NAME=MemberList COLS = 60 ROWS=5></
TEXTAREA></PRE>
    <PRE><INPUT NAME=CallUser TYPE=BUTTON VALUE="Join">
    <INPUT NAME=LeaveConf TYPE=BUTTON VALUE="Leave"></PRE>
</CENTER>

<OBJECT
```


SAMSUNG EXHIBIT 1017, Page 273

```
    ID=ConfMgr
    CLASSID="clsid:53D22820-D7E8-11CF-AD0A-0080C7137C82">
</OBJECT>

<SCRIPT LANGUAGE="VBScript">
Option Explicit     ' All variables must be defined

' Define our global conference object
Dim Conference

Sub Window_OnLoad
' Place initialization code here
End Sub

Sub Window_OnUnload()
' Place termination code here
End Sub

Sub ErrorMsg(text)
' Error handler
    MsgBox "Error " & Hex(Err.Number) & ": " & text
End Sub

' Button Events

Sub CallUser_onClick()

' Join the conference code goes here

End Sub

Sub LeaveConf_onClick()

' Leave button click code goes here

End Sub

' Conference Manager Events

Sub ConfMgr_ConferenceCreated(ByVal pConference)

' This event is fired when the conference is created

End Sub

Sub ConfMgr_MemberChanged(ByVal pConference, ByVal pMember,
ByVal lNotify)
```

(continued)

SAMSUNG EXHIBIT 1017, Page 274

(continued)

```
' Fired when a member joins, leaves, or information changes

End Sub

Sub ConfMgr_StateChanged(ByVal pConference, ByVal lConfState,
ByVal hrArg)

' Called when the state of the conference changes

End Sub

</SCRIPT>

</BODY>
</HTML>
```

Now that you have the basic code, you can add more code to create and delete the conference and to join or leave the conference. Notice in Listing 14-1 that you created your Conference Manager object (variable: *ConfMgr*) and Conference object (variable: *Conference*). Because you did not declare them in a subprocedure, they are global to the script and you can access them by any subprocedure in the script.

Initializing the Control

To initialize the Active X control, add Listing 14-2 to the *Window_OnLoad* subprocedure. In Listing 14-2, you create a Conference Collection object (variable: *Conferences*) because many conferences can run simultaneously. After you declare your variables, initialize your Conference Manager object. Pass the GUID of the calling application, then go through the conference collection and select the first available conference. If there are members already in the conference, add them to the text box. The *ConfMgr.Advise* and *Conference.Advise* variables let the ActiveX control listen for notifications.

LISTING 14-2. CONF.HTM—ONLOAD EVENT CODE.

```
Sub Window_OnLoad
    Dim strCaps
    Dim lCaps
    Dim Conferences

    Set Conference = Nothing

    On Error Resume Next

    If Not ConfMgr.Initialize("{00021191-0000-0000-C000-
000000000000}") Then
```


SAMSUNG EXHIBIT 1017, Page 275

```
        ErrorMsg "failed to initialize conference manager"
        Exit Sub
    End If

    ConfMgr.Advise

    Set Conferences = ConfMgr.Conferences
    If Not (Conferences Is Nothing) Then
        Set Conference = Conferences(0)
        If Not (Conference Is Nothing) Then
            Conference.Advise
            UpdateMemberList
  End If
    End If
End Sub
```

Updating the Member List Box

Now you must add a subroutine, in Listing 14-3, to update the member list box. You can add this code before the previous listing. The order does not really matter as long as it is contained within the <SCRIPT> tags in the HTML. You may find it easier to manage the code if you keep all of the Windows events, such as Load and Unload, together and place all of your subroutines together. Then you can easily cut and paste these routines to other Web pages.

LISTING 14-3. CONF.HTM—MEMBER UPDATE ROUTINE.

```
Sub UpdateMemberList()
    Dim Members
    Dim Member
    Dim i

    On Error Resume Next
    Set Members = Conference.Members
    If Members Is Nothing Then
        MemberList.Value = "Error" & Hex(Err.Number)
    Else
        MemberList.Value = ""
        For i = 0 To Members.Count - 1
            MemberList.Value = MemberList.Value &
Members(i).name & _
                Chr(13) & Chr(10)
        Next
    End If

End Sub
```


SAMSUNG EXHIBIT 1017, Page 276

Clearing the Conference Information

When the page is closed or the conference is terminated, you will need to clear the Conference object. Listing 14-4 adds a routine to perform this operation. Note that listing 14-5 will call this routine when the Web page is unloaded.

LISTING 14-4. CONF.HTM—ROUTINE TO CLEAR THE CONFERENCE INFORMATION.

```
Sub ConferenceCleanup()
    MemberList.Value = ""

    If Not (Conference Is Nothing) Then
        Conference.Unadvise
        Set Conference = Nothing
    End If
End Sub
```

Cleaning up Code

Listing 14-5 adds the cleanup code you need. Because you have opened a conference and a Conference Manager object, it makes sense that you would need to close them down. There is no need to clean up the text box, but it is a nice thing to do for the Web page users.

LISTING 14-5. CONF.HM—CLEANUP CODE FOR WHEN THE PAGE IS TERMINATED.

```
Sub Window_OnUnload()

    ConferenceCleanup
    ConfMgr.Unadvise
    ConfMgr.Uninitialize

End Sub
```

Handling the Buttons

That takes care of the basics. Now let's add some code to handle the buttons so you can join or leave the conference. Listing 14-6 adds the code you need to join the conference. Notice that if a conference was not previously created, this creates one. Then you create a user and invite the user to join the conference. The user in this case is a computer name. You would want to enter the correct name in place of *HOSTNAME*. After a user joins a conference, he or she changes

SAMSUNG EXHIBIT 1017, Page 277

from a user to a member. At this point, you want to reassemble all the members of the conference and put their names in the text box. The code to do this is presented in Listing 14-6.

LISTING 14-6. CONF.HTM—EVENT CODE FOR JOINING THE CONFERENCE.

```
Sub CallUser_onClick()
    Dim User

    On Error Resume Next
    If Conference Is Nothing Then
    ' create the conference (1 = data only)
        Set Conference = ConfMgr.CreateConference("TestConf", 1)
        If Conference Is Nothing Then
            ErrorMsg "failed to create conference"
            Exit Sub
        End If

        Conference.Advise
    End If

    ' create a user (2 = machine name)
    ' Remember to change the HOSTNAME to the name that you want
to call
    ' You can even have another control set this property to
make it more
    ' dynamic

    Set User = ConfMgr.CreateUser("HOSTNAME", 2)
    If User Is Nothing Then
        ErrorMsg "failed to create user"
    Else
        If Not Conference.Invite(User) Then
            ErrorMsg "failed to invite user"
        End If
    End If

End Sub
```

Implementing the Leave Conference Button

When you press the Leave Conference button, you need to call the necessary routines to free all the resources that were taken up by our conferencing activities. See Listing 14-7 for how to do this.

SAMSUNG EXHIBIT 1017, Page 278

LISTING 14-7. CONF.HTM—CODE TO IMPLEMENT THE LEAVE CONFERENCE BUTTON.

```
Sub LeaveConf_onClick()
    On Error Resume Next
    If Conference Is Nothing Then
        MsgBox "No active conference"
    Else
        If Not Conference.Leave Then
            ErrorMsg "failed to leave conference"
        End If
    End If
End Sub
```

Handling the Conference Manager Events

Finally, you must add the proper routines to handle the Conference Manager events. These events are fired when things happen in the control. By adding the code in Listing 14-8, your application can react to the Conference Manager object. I have hooked the *MemberChanged* event so that the user listing is updated when someone leaves or enters the conference.

LISTING 14-8. CONF.HTM—EVENT HANDLERS FOR THE CONFERENCE MANAGER.

```
Sub ConfMgr_ConferenceCreated(ByVal pConference)
    Set Conference = pConference
    Conference.Advise
End Sub

Sub ConfMgr_MemberChanged(ByVal pConference, ByVal pMember,
ByVal lNotify)
    UpdateMemberList
End Sub

Sub ConfMgr_StateChanged(ByVal pConference, ByVal lConfState,
ByVal hrArg)
    Select Case lConfState
        Case 2 ' CNF_STATE_START
            UpdateMemberList
        Case 3 ' CNF_STATE_STOP
            ConferenceCleanup
    End Select
End Sub
```


SAMSUNG EXHIBIT 1017, Page 279

Loading and Testing

That's it! Now you are ready to load the page into your browser and test it out. Don't forget that you must install NetMeeting for this page to work. When you attempt to open this page in Internet Explorer, you will be presented with a notice, shown in Figure 14-1, informing you of a possible security issue. You choose whether to allow the control to be executed. This is a nice way for the user to be aware that something is going on with his or her computer and to have a degree of control.

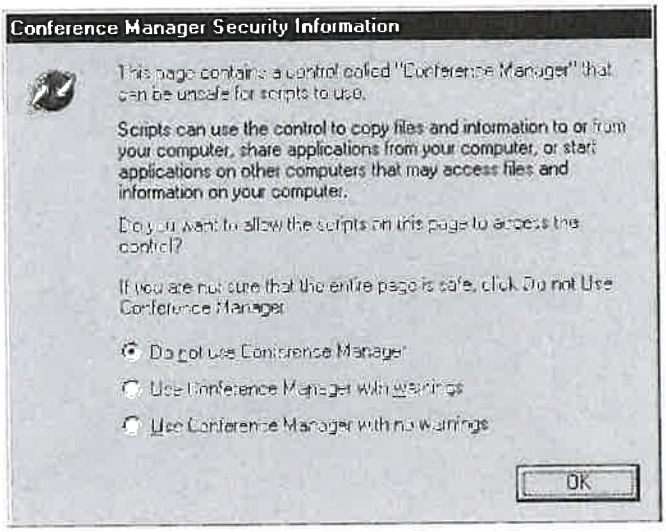


Figure 14-1. *Internet Explorer asks for your permission to execute the ActiveX control.*

Constants Used by the SDK

Throughout the chapter, I have made reference to constants. Listing 14-9 is a compilation of all the constants used by the conferencing SDK.

LISTING 14-9. XMSCONF.BAS—CONSTANTS NEEDED DURING SDK OPERATIONS.

```
Public Const CNF_SHR_UNKNOWN As Long = 0
Public Const CNF_SHR_SHARED As Long = 1
Public Const CNF_SHR_UNSHARED As Long = 2

Public Const CNF_FILE_IDLE As Long = 0
```

(continued)

SAMSUNG EXHIBIT 1017, Page 280

(continued)

```
Public Const CNF_FILE_INITIALIZING As Long = 1
Public Const CNF_FILE_PROGRESS As Long = 2
Public Const CNF_FILE_COMPLETE As Long = 3

Public Const CNF_MEMB_ADDED As Long = 0
Public Const CNF_MEMB_REMOVED As Long = 1
Public Const CNF_MEMB_UPDATED As Long = 2

Public Const CNF_STATE_IDLE As Long = 0
Public Const CNF_STATE_INIT As Long = 1
Public Const CNF_STATE_START As Long = 2
Public Const CNF_STATE_STOP As Long = 3
Public Const CNF_STATE_OFFERED As Long = 4

Public Const CNF_CAPS_NONE As Long = 0
Public Const CNF_CAPS_DATA As Long = 1
Public Const CNF_CAPS_AUDIO As Long = 2
Public Const CNF_CAPS_VIDEO As Long = 4

Public Const CNF_USER_UNKNOWN As Long = 0
Public Const CNF_USER_IP As Long = 1
Public Const CNF_USER_MACHINENAME As Long = 2
Public Const CNF_USER_PSTN As Long = 3

Public Const CNFF_SDOPT_NONE As Long = 0

Public Const CNFF_SFOPT_NONE As Long = 0
Public Const CNFF_SFOPT_NOUI As Long = 2
Public Const CNFF_SFOPT_NOCOMPRESS As Long = 4
```

FROM HERE...

In this chapter, I have shown you how to use the ActiveX portion of the NetMeeting SDK. I covered the details of the Conference Manager object and showed an example of how to use it in HTML using VBScript. If you are interested in learning more about the SDK, then you should refer to its documentation. It contains more details than are presented in this chapter and also includes some examples with source code.

Refer to these chapters for additional NetMeeting information:

- Chapter 4, "Making Your First Call," covers how to place a NetMeeting call using a direct modem connection, the Internet, or LAN.

SAMSUNG EXHIBIT 1017, Page 281

- Chapter 9, "Hosting a Group Conference," discusses the process of hosting and maintaining a multipoint conference.
- Appendix A, "Glossary," contains definitions for all the conferencing terms contained in this text.
- Appendix B, "Additional Online Information," lists other online resources for information relating to all aspects of NetMeeting.

SAMSUNG EXHIBIT 1017, Page 282

Part IV

TROUBLESHOOTING NETMEETING



Chapter 15

Troubleshooting Audio

In this chapter, you will learn:

- **All about general audio problems**. Audio can be difficult to set up because of the vast assortment of problems that can arise. I'll show you the most common problems and how to solve them.
- **Full-duplex**. This allows your computer to play and record at the same time, which is required for the full telephone-like operation of NetMeeting's audio features.
- **Improving the quality**. Learn how to improve the quality of NetMeeting's audio features.

As explained in Chapter 6, your ability to use NetMeeting's audio features depends on your sound card, network connection capability, the available bandwidth, and configuration options. All of these elements must be set properly and must function correctly for you to use NetMeeting's audio capabilities effectively. In most cases, if your sound card already works with Windows, you won't have any trouble with NetMeeting. However, many of you may be using a microphone with your computer for the first time, and that can cause some problems.

This chapter is designed to help you solve any problems that you may have with NetMeeting's audio features. If your audio is working properly, you don't

SAMSUNG EXHIBIT 1017, Page 286

need to refer to this chapter. However, both participants in a NetMeeting connection must have their audio working properly. This adds a level of complexity: although your system may be working fine, if the other person is having problems, you may experience them as well.

This chapter looks at the most common problems and solutions to using NetMeeting's audio features. Some issues, such as hardware compatibility and sound card driver capability, are outside the scope of this chapter. For these problems, you may have to contact the hardware manufacturer for updated software and information about the problem. Most manufacturers offer free software updates on the Internet.

Microsoft has included an audio troubleshooting guide with NetMeeting. This may help you solve any problems. To view the online help for audio problems, follow these steps:

1. In NetMeeting, click Help from the main menu.
2. Select Help Topics.
3. On the Contents tab, select Troubleshooting and click Open.
4. Select "If you have trouble using NetMeeting" and click Display.
5. Finally, click "I'm having trouble using the audio features" and follow the online instructions.

Before you continue reading this chapter, you may want to check some of the most common reasons why the audio may not be working on your computer:

- Are the speakers plugged into the sound card and do they have power?
- Is the microphone plugged in?
- Do you have a Windows-compatible sound card installed in your computer?
- Are the drivers for the sound card installed properly?
- Do you have the most recent drivers from the manufacturer for your sound card?
- Have you turned on the audio features?
- Does your connection support the TCP/IP protocol? (If you are using the Internet, the answer is yes.)
- Does the computer to which you are connected have properly working audio?

SAMSUNG EXHIBIT 1017, Page 287

SOLVING GENERAL AUDIO PROBLEMS

To troubleshoot audio problems with NetMeeting, you should identify the problem, go through each item in this chapter, and follow the instructions provided under each topic. In some cases, several troubleshooting items may help you get NetMeeting's audio feature working. If you are unable to use NetMeeting's audio features, first check the most common reasons discussed in this chapter. Verify that the other computer to which you are connected can use its audio features, and make sure that you are not hosting a conference and did not place a data-only call. These are just a few of the reasons why you may not be able to use audio. NetMeeting also provides the Audio Tuning Wizard for diagnosing audio problems. You can access the Audio Tuning Wizard from the Tools menu.

NetMeeting attempts to use the audio features by default when you place a call. You can change that behavior, however, by using the Advanced Calling command on the Call menu and specifying that the audio features should not be used for a particular call. Keep in mind that once you participate in a meeting that does not have audio features enabled (because it was started as a data-only call), you will not be able to use the audio features without restarting the meeting.

Trying to Include More Than Two Participants

One limitation of NetMeeting's audio features is that it will only work between two people without the use of an external conferencing server. If more than two people are participating in a meeting, only the first two who joined the meeting are able to use the audio features. If you were not one of the first two people to join the meeting, then you must restart the meeting to use audio. In the future, multipoint audio and video will be added to NetMeeting to overcome this limitation.

Connecting to Someone Who Can't Use Audio Features

If you connect to a computer that cannot use NetMeeting's audio features, you will be unable to use audio too. Both computers must have fully functional audio equipment and must be configured properly.

If you think your audio may not be working because of the computer you're connected with, connect to another computer that you know can use NetMeeting's audio features. If you are then able to use the audio features, the problem obviously comes from the computer that you were originally connected with. That computer must resolve its audio difficulties for you to exchange audio with it.

SAMSUNG EXHIBIT 1017, Page 288

Hosting a Conference

If you are hosting a NetMeeting conference, you cannot use NetMeeting's audio features. There is no way around this; it is part of the way NetMeeting works. In this case, you can only regain audio capability by ending the conference and starting another meeting. When you reconnect, remember not to host a conference if you want to use the audio features.

Giving Audio Control to NetMeeting

Once a program has taken control of your sound card, other programs cannot use it. Therefore, if you are using NetMeeting's audio features, other programs will not be able to use the sound card. It also works in reverse: if another program has taken control of the sound card, you will not be able to use NetMeeting's audio features.

When NetMeeting is running on your computer and its audio features are enabled, your computer may experience one or more of the following symptoms:

- Sounds assigned to events in Windows 95 do not play when the corresponding event occurs.
- If you double-click the Sounds icon in Control Panel and attempt to manually play a sound associated with an event, the following error message is displayed: "Windows cannot play the sound <filename>. Your sound card may be in use."
- If you attempt to play a WAV file in Sound Recorder, the following error message is displayed: "Another application is playing audio. You can either interrupt the application or wait until it is done. Then try using Sound Recorder again."

You are not able to play WAV files in Windows when NetMeeting is running on your computer and its audio features are enabled. You can get around this by disabling NetMeeting's audio features—click the check boxes on the Audio toolbar to clear them. If the Audio toolbar is not visible, click Toolbar on the View menu.

Running the Audio Tuning Wizard Without a Microphone

The Audio Tuning Wizard will run even if you have not installed a microphone on your computer. It is necessary for NetMeeting to run the Audio Tuning Wizard to assess the functionality of your computer's sound card. This wizard helps set volume and sensitivity that affect the exchange of audio during a connection and is run automatically the first time that you run NetMeeting on your

SAMSUNG EXHIBIT 1017, Page 289

computer. You can click Cancel to stop the Audio Tuning Wizard during installation. Once you have installed a microphone, you can run the Audio Tuning Wizard manually (from the Tools menu) to adjust the microphone settings.

Changing Volume

When you begin NetMeeting, the speaker level volume may be different than it was the last time you used NetMeeting. This is because the master system volume setting in Windows changed since you last used NetMeeting. Most applications, including NetMeeting, share the same master volume settings. The speaker volume control in NetMeeting merely adjusts the master system volume. When NetMeeting starts, the master volume setting is inherited from any other applications or manual changes that you have made to the speaker volume, so NetMeeting does not remember its last setting. You can return the volume to an acceptable level by adjusting the speaker volume. Follow these steps:

1. On the main NetMeeting menu, click Tools and then click Options.
2. Select the Audio tab.
3. Click "Let me adjust sensitivity myself".
4. Move the slider to the desired position. (Moving the slider to the right will increase the sensitivity.)

Figuring Out Sound Cards and Drivers

Some of the most common problems encountered when operating the audio feature of NetMeeting are with the sound card hardware or software drivers. Most sound cards that you purchase today are compatible with Windows. Any card that says Microsoft Sound System compatible or SoundBlaster compatible should work with Windows. If you have any doubt, check the manual. A Windows 95 Hardware Compatibility List (HCL) is also available on the Microsoft Web site at http://www.microsoft.com/hwtest. In most cases, you may need to get new device drivers from the manufacturer.

The following section contains some of the most common problems and solutions relating to your sound card and device drivers. If you can play and record a WAV file in the Sound Recorder, your audio problems are not related to the sound card or the device drivers.

> **NOTE**
>
> A WAV file is the Windows file format standard for sound files.

SAMSUNG EXHIBIT 1017, Page 290

Memory Resident Programs

Other application programs or memory-resident programs that use the sound card can interfere with NetMeeting's audio capabilities. Simply quit these applications to enable NetMeeting to use the sound card. Memory-resident programs are generally loaded during the boot process of your computer. You can check the AUTOEXEC.BAT, CONFIG.SYS, SYSTEM.INI, and WIN.INI files for any programs loading during the boot process that could conflict with NetMeeting.

Use Current Drivers

The manufacturer's Internet Web site is one of the first places to check when you suspect that the audio problem is related to your sound card. Usually you will find the most up-to-date drivers that can solve many problems.

Some older sound card drivers don't allow NetMeeting to automatically configure the microphone sensitivity settings based on a sample that you record. If you are using a sound card that has this older type of software driver, the Audio Tuning Wizard may report that NetMeeting does not support your sound card. Your sound card may still function properly, however, and you may be able to use NetMeeting's audio features, but you may be not be able to change the microphone volume settings.

Problems with the Drivers

Sometimes the sound drivers may become damaged, causing the sound card to malfunction. You should verify that the sound card drivers you are using are configured correctly and are not damaged. One of the easiest ways to solve this type of problem is to simply reinstall the drivers from the disk provided by the hardware manufacturer.

Before reinstalling the sound drivers, you should remove the driver from the Control Panel by following these steps:

1. Open the Control Panel by clicking Start, Settings, Control Panel.
2. Double click on the System icon.
3. Select the Device Manager tab.
4. Double-click "Sound, video and game controllers". This will expand a listing of drivers.
5. Select your sound card driver by clicking it once.
6. Click the Remove button.

Conflicting Devices

Installing a sound card into your computer can sometimes cause difficulties because the card may need resources that are not be available in your computer. "Plug and Play" is designed to help eliminate resource conflicts, but sometimes

SAMSUNG EXHIBIT 1017, Page 291

it does not work properly, or the hardware that you have installed is not Plug and Play compatible. If a resource conflict exists between your sound card and another device in your computer, you will most likely have some problems with the NetMeeting audio features. You can check whether Windows detects a conflict by opening the Control Panel and clicking the System icon. Then select the Device Manager tab. The System Properties screen shows conflicts between devices with a yellow exclamation mark.

If you are using the full-duplex capabilities of your sound card, this option sometimes can cause a conflict because a sound card set in full-duplex audio requires more resources than one set in half-duplex.

To determine whether the problems are due to the fact that you are using a full-duplex sound card, simply disable full-duplex audio in NetMeeting. You can do this by clicking on the Tools Options menu, clicking the Audio tab, and clicking the "Enable full duplex audio so I can speak while receiving" check box to clear it. If disabling full-duplex audio corrects the problem, then most likely there is a resource conflict between the sound card and another device installed in your computer. You can fix this problem by configuring the sound card or other device to use different resources that do not conflict. The manufacturer of your sound card should have information on changing the required resources of your hardware.

> **NOTE**
>
> The sound card drivers included with Windows 95 do not support full-duplex audio. If your sound card supports full-duplex audio, you must use the drivers supplied by the manufacturer. Many manufacturers have full-duplex sound drivers available on their Internet Web sites.

SOLVING PROBLEMS WITH FULL-DUPLEX OPERATION

Full-duplex sound cards enable simultaneous processing of sound recording and playback. If you use a full-duplex sound card, you can talk into a microphone and simultaneously listen to another NetMeeting participant with your speakers or headphones.

When you use a half-duplex sound card, you must wait for the meeting participant to finish speaking before you can speak into the microphone. When you start a NetMeeting conference, you experience half-duplex audio instead

SAMSUNG EXHIBIT 1017, Page 292

of the full-duplex audio you expect.

The requirements for a full-duplex audio conversation are:

- Full-duplex sound card
- Full-duplex sound card driver
- Full-duplex audio enabled in NetMeeting
- Necessary speakers/headphones and microphones
- The other conference participant must also be capable of full-duplex audio

Sound Card Capability

Determine whether the sound cards and drivers are capable of full-duplex audio and verify that full-duplex audio is enabled in NetMeeting on both computers.

Both participants in the conference must have full-duplex audio capabilities to have a full-duplex conversation. It is possible to connect a full-duplex system to one with half-duplex for an audio conference, but the conversation will only be half-duplex.

Testing for Full-Duplex Audio

Determining whether the sound card and driver support full-duplex audio is fairly easy. You can check whether you can play and record audio at the same time using the Sound Recorder. This program comes with Windows 95. If it is not installed, you can use the Windows Setup tab in the Add/Remove Programs Properties dialog box in the Control Panel. To determine whether your sound card and driver support full-duplex audio, follow these steps.

1. Click the Start button. From the cascading menu, point to Programs, point to Accessories, point to Multimedia, and then click Sound Recorder.
2. Repeat Step 1 to start a *second* Sound Recorder session.
3. In the first Sound Recorder session, play a sound (WAV) file that is at least 30 seconds long.
4. While the first session of Sound Recorder plays the WAV file, switch to the second session of Sound Recorder and record a WAV file.

If you can record a WAV file while the other WAV file plays, your sound card and drivers support full-duplex audio. If you cannot record a WAV file while another WAV file plays, there is a problem in one of the following areas:

SAMSUNG EXHIBIT 1017, Page 293

- The sound card does not support full-duplex audio.
- The sound card driver does not support full-duplex audio.
- The sound card or sound card driver is not properly configured to support full-duplex audio.

Full-Duplex Configuration Options

The Audio Tuning Wizard included with NetMeeting can determine whether a sound card supports full-duplex audio. This tool does not enable full-duplex audio by default, however.

To verify whether full-duplex audio is enabled in NetMeeting, follow these steps.

1. Click Options on the Tools menu.
2. Click the Audio tab and make sure the Enable Full Duplex Audio check box is selected.

Other Full- and Half-Duplex Audio Considerations

If one party is full-duplex-capable and the other party is half-duplex-capable, the full-duplex audio party can send and receive simultaneously, though the half-duplex audio party cannot. This means that if both parties are talking (sending) at the same time, the full-duplex audio party will hear (receive) what the half-duplex audio party is saying while the half-duplex audio party will not hear (receive) anything. Both parties will have to adjust to what is effectively a half-duplex conversation.

A common technique is to say "Over" or "Your turn" or "Back to you" when you have finished talking. Keep each turn fairly short (under 30 seconds) so the other party can get a chance to respond.

Suppose a full-duplex audio party is talking and a half-duplex audio party is receiving and everything seems to be working. Also suppose that the full-duplex system does not have the audio sensitivity tuned correctly for the current environment, or the audio environment changes. This can happen if there is a change in background noise from when the Audio Tuning Wizard had originally set the audio sensitivity; for example, a radio or television is playing nearby, an air conditioner or heating fan turns on, a quiet discussion starts in the background, a door opens letting in traffic sounds, and so on.

At this point, the full-duplex audio party stops talking, but the microphone picks up the ambient noise and sends it. Because the full-duplex system is still sending, the half-duplex system will not switch from receive to send mode. The sound may not be loud enough to be audible to the half-duplex audio party. The solution is for the full-duplex audio party to run the Audio Tuning Wizard

SAMSUNG EXHIBIT 1017, Page 294

again so that the other user can retune sound sensitivity for the current audio environment, including current ambient noise levels.

FIXING POOR AUDIO QUALITY

When you participate in an audio conference with Microsoft NetMeeting, you may experience various audio problems, including poor audio quality, voice distortion, echoing, or sound loss. Audio quality can be influenced by any of the following conditions:

- Poor sound card quality or a malfunctioning card.
- Poor microphone quality or a malfunctioning microphone.
- Incorrect Microphone sensitivity (usually set by the Audio Tuning Wizard).
- Wrong network connection speed (usually set by the Audio Tuning Wizard).
- Incorrect type of audio compression.
- Not enough CPU speed/power.
- Other programs running in memory.
- Full-duplex versus half-duplex audio conference.
- A simultaneous video conference or data conference.
- Limited bandwidth from your Internet service provider.
- One of the meeting participants may have the microphone positioned too close to the speakers.
- The computer has more than one audio device.

Other processes involved in NetMeeting can affect audio quality and general performance. Sharing several programs while simultaneously running Whiteboard and Chat and performing a large file transfer will affect available bandwidth for audio, as well as consume memory. To improve audio quality, try the following:

1. Close unnecessary programs that are running.
2. Reduce the number of shared programs.
3. Close unnecessary windows, including Chat or Whiteboard.
4. Postpone large file transfers.

SAMSUNG EXHIBIT 1017, Page 295

Choppy full-duplex sound may indicate that the sound card cannot simultaneously send and receive audio signals. Try switching NetMeeting to half-duplex audio sound quality. Full-duplex audio can require both more bandwidth (a faster connection) and more processing power (a faster computer) than half-duplex audio and may result in poor sound quality.

Voice distortion may be caused by talking too close to the microphone or by the microphone's sensitivity. First try speaking a little further away from the microphone. Ask the other conference participant to let you know if your audio sounds better. If this does not help, you might need to adjust the microphone sensitivity setting by running the Audio Tuning Wizard again or manually adjusting the microphone sensitivity. Have the other participant move the microphone away from the speakers. Decreasing the volume of the speakers may also help.

There may have been a change in the background noise levels since the Audio Tuning Wizard was last run, so run the Audio Tuning Wizard again to readjust the levels.

Running audio and video simultaneously on a computer with a slower processor may also impact audio quality. Try turning off the video, or reducing the image quality you are receiving.

Your Internet service provider may have limited bandwidth, use a proxy server of some kind, or may have periods of peak usage.

Audio interference may be generated by other hardware in your computer. Try moving your sound card to a slot away from video cards or fans; they may cause playback problems with sound cards. Run NetMeeting in a quiet environment. This problem is especially true on laptops in which the microphone is located near the cooling fan. The only solution for this problem is to use an external microphone, if your laptop has a microphone jack.

Using the Audio Tuning Wizard

As mentioned earlier in this book and this chapter, the Audio Tuning Wizard determines whether full-duplex audio is available, specifies the recording and playback devices, and enables you to specify the network connection speed and set the microphone sensitivity.

> **NOTE**
>
> You cannot use the Audio Tuning Wizard during a conference, so leave the conference first and then run the Audio Tuning Wizard. You can then rejoin the conference once the Audio Tuning Wizard is complete.

SAMSUNG EXHIBIT 1017, Page 296

If your computer has more than one audio device, make sure that the audio devices selected in the Audio Tuning Wizard match the selections in the Multimedia tool in Control Panel. If the Audio Tuning Wizard indicates that your sound card is not supported, you may be able to use the NetMeeting audio features but may experience poor audio quality. As a quick refresher, we'll walk through using the Audio Tuning Wizard again:

1. In NetMeeting, click Audio Tuning Wizard on the Tools menu.
2. Follow the instructions on the screen.

To switch to half-duplex audio, follow these steps.

1. In NetMeeting, click Options on the Tools menu.
2. Click the Audio tab, then click the "Enable full duplex audio so I can speak while receiving audio" check box to clear it.

To manually adjust microphone sensitivity, follow these steps.

1. In NetMeeting, click Options on the Tools menu.
2. Click the Audio tab and, in the "Microphone sensitivity" area, click "Adjust sensitivity automatically (recommended)". If this option is already selected, click "Let me adjust sensitivity myself".
3. Adjust the Sensitivity slider.

If you move the slider to the right, your voice will be transmitted earlier (there will be no delays after you speak) and will be less likely to cut out, but you might transmit background sound when you are silent. After you adjust the setting, speak a few sentences and wait for feedback from a conference participant before changing the setting again.

If the sound continues to worsen, run the Audio Tuning Wizard again to reset your audio values.

Avoiding Echo

When you speak into a microphone during a NetMeeting conference to a participant who is using a full-duplex sound card, your voice may echo back through your speakers or headphones. This can happen when one participant's microphone is positioned too close to his or her speakers. To rectify this, the other NetMeeting participant can

- Move his or her microphone away from the speakers
- Decrease the volume of the speakers
- Adjust the sensitivity of his or her microphone

SAMSUNG EXHIBIT 1017, Page 297

- Run the Audio Tuning Wizard to automatically adjust the volume levels
- Disable the use of full-duplex audio drivers
- Use a headset

FROM HERE...

This chapter has shown you how to fix most any problem that can occur with your sound card and how to improve the quality of a NetMeeting audio conversation. If you still have audio problems, you should seek help from the manufacturer of your sound card.

Refer to the following chapters for additional troubleshooting tips:

- Chapter 16, "Troubleshooting Video," covers finding and fixing problems associated with the video component of NetMeeting.
- Chapter 17, "General Troubleshooting Techniques," will help you with general NetMeeting problems that are not covered in the audio or video troubleshooting chapters.

SAMSUNG EXHIBIT 1017, Page 298

Chapter 16

Troubleshooting Video

In this chapter, you will learn:

- **How to solve general problems with video.** Video is one of NetMeeting's most interesting and complex features; therefore, setting it up can require some troubleshooting. This chapter will help you solve the most basic problems encountered when adding video to NetMeeting.
- **How to improve performance.** Once you've configured NetMeeting's video to work properly, you'll learn how to make it operate more efficiently as well.
- **How to increase video quality.** You'll also learn how to improve the video image quality and frame rate.

This chapter helps you diagnose and solve most problems related to the video features of NetMeeting, including common hardware problems and quality issues. If you need help using the video features, first take a look at Chapter 7, "Video Conferencing." You can find some good information about the entire video process in that chapter to help you with configuration and setup.

SAMSUNG EXHIBIT 1017, Page 300

Unfortunately, there is no online troubleshooting guide built into NetMeeting for the video features. This is most likely because video is such a new addition to the product. Setting up the video is actually easier than the audio, even though it is a more complex process. There are fewer options and settings for video.

This chapter will especially focus on the subject of video capture. There are many types of video capture devices on the market that range in price and capability. If you are having trouble getting your video capture device to function with the software that came with it, then you should reference the user's manual for the device or contact the manufacturer.

SOLVING GENERAL VIDEO PROBLEMS

Your video equipment is installed and you are ready to try out your "new toy," but you find out that you cannot send or receive video. This could be for a number of reasons. You may have a hardware compatibility, software driver, or configuration problem. Another possibility is that your computer is too slow to process video. The minimum requirement to send video is a Pentium class computer.

You also may have a network bandwidth problem (trying to send more data than the network can handle). Finally, remember that video is only supported between two participants in a meeting.

If you are having any of these problems, you should walk through the various problem areas that might affect the video features. We'll look at these in turn in the following sections. After troubleshooting each area, check to see if you resolved the problem. Don't forget that the manufacturer has provided you with a user's manual that may contain some valuable information about getting your capture card to function. Some manufacturers may even address NetMeeting directly.

> **NOTE**
>
> If you cannot use the audio features of NetMeeting, you will not be able to use the video features either.

VIDEO CONFIGURATION OPTIONS

If you want to send and receive video then you have to turn on those features. You can easily verify that you have enabled the video features on the NetMeeting Options page, as show in Figure 16-1, by following these steps:

SAMSUNG EXHIBIT 1017, Page 301

1. Click Tools, and then Options from the main menu.
2. Click the Video tab.
3. Look in the Sending and Receiving Video area and verify that "Automatically send video at the start of each call" and "Automatically receive video at the start of each call" are enabled.

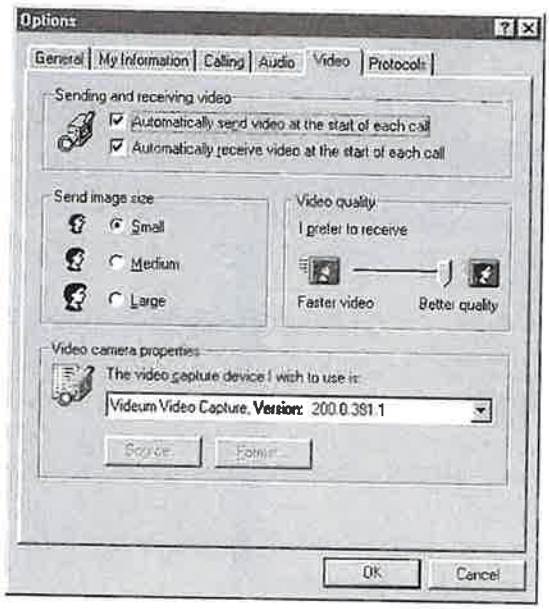


Figure 16-1. *Enabling the video features of NetMeeting.*

Verify that the sound card and video equipment installed in your computer are compatible with Windows 95 or Windows NT. To use the video features of NetMeeting 2.0 and later, you need a supported sound card and a video capture device like a parallel (printer) port camera or a video capture card. The Hardware Compatibility List (HCL) for Windows 95 or Windows NT contains a list of computer systems and peripheral devices that are identified as compatible. You can find this list on Microsoft's Web site at:

```
http://www.microsoft.com/isapi/hwtest/hsearch.idc
```

If multiple video devices are installed on your computer, NetMeeting might not recognize one or more of them. Windows can use only one video capture device at a time, but you can have multiple devices installed at the same time. NetMeeting will allow you to choose the active capture device on the Video Options tab. You can also check the status of the capture driver through the Control Panel in the Multimedia Properties, as shown in Figure 16-2. If you previously uninstalled

SAMSUNG EXHIBIT 1017, Page 302

another capture driver, it is possible that the uninstall did not remove the capture driver from the registry. In this case, you can manually delete it in the Advanced area of the Multimedia Properties. To see the advanced options of the Multimedia Properties, you need to perform the following steps:

1. Open the Control Panel by clicking Start, Settings, and Control Panel.
2. Double-click the Multimedia icon.
3. Select the Advanced tab.
4. Double-click Video Capture Devices.

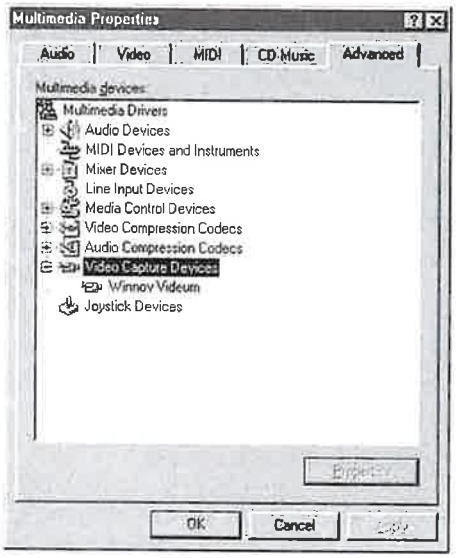


Figure 16-2. *Advanced Multimedia Properties shows you all multimedia devices.*

If there are no drivers listed under Video Capture Devices, the drivers for your capture card have not been installed properly or are not compatible with Video for Windows. Try reinstalling the drivers that came with the capture device if this is the case. The capture device *must* be listed in the Advanced section of the Multimedia Properties for NetMeeting to use the video capture device. If you have installed the drivers for your capture device and it is not listed then your device is *not* compatible with Video for Windows.

You also can check the status of the device driver by selecting the device and clicking Properties. This displays a dialog window that shows if the driver is enabled or not, as shown in Figure 16-3. You also can click the Settings button for more information about your device and additional settings. Note that some manufacturers do not support the Settings button, and it may be disabled.

SAMSUNG EXHIBIT 1017, Page 303

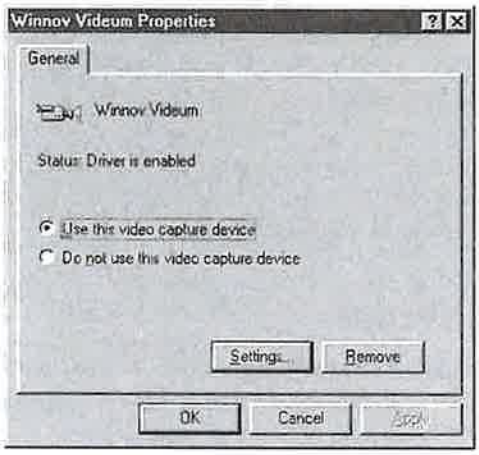


Figure 16-3. *Video Settings shows the current status of the video device driver.*

The Camera Is Not Responding

If you receive a message that the camera is not responding, this means (in most cases) that the drivers are installed properly, but the camera may not be connected. This is a simple problem to fix. Just plug in the camera. You may have to restart NetMeeting. If you know that the camera is disconnected and you want to get rid of the message, you can simply disable NetMeeting's video features on the Video tab of the Options page.

My Video Window Is Black

The My Video window is a preview of the local video and is a good indication of whether a video capture device is functioning. The My Video window could be black for any of the following reasons:

- Your camera is turned off.
- The video capture device is configured to use an unsupported video format.
- The video capture device does not support Microsoft Video for Windows.

The first problem is easy to fix, you just have to turn on the camera. However, the other two may be more tricky and are related. If your capture card is compatible with Microsoft Video for Windows, it should support one of the following formats: RGB4 (16 colors), RGB8 (256 colors), RGB16 (65,000 colors), RGB24 (millions of colors), or YVU9 (Indeo Raw Format). These are the formats of the video frames that are sent from the capture driver software to

SAMSUNG EXHIBIT 1017, Page 304

NetMeeting. NetMeeting also supports these standard formats but if the data uses a different format, NetMeeting won't know how to display the data on the screen. Thus, you may have a black screen. You can set the video format by using the configuration program that came with the video capture card. You also may want to verify that the capture device is compatible with Video for Windows before you buy it. Most manufacturers display this prominently on the packaging to make sure you know it will work with your system.

PERFORMANCE ISSUES

The performance of the video is always a big concern when using NetMeeting. You might expect the video to look similar to the quality of your television, but as explained in Chapter 7, "Video Conferencing," this is simply not possible in most cases because you are limited by bandwidth. Bandwidth is the amount of data that you can transfer through the network, and in most cases, it can be a precious commodity. You can, however, control the amount of bandwidth used and improve the performance. Usually there is a tradeoff between image quality and motion. If you require high image quality (high-resolution frames), you may not get fluid motion in the image, but if you require a high degree of motion (high frame rate), then most of the time the image quality may be lower and the video may appear "blurry."

The following will affect the performance of the video features of NetMeeting:

- **Processor type.** Pentium, Cyrix 586, or AMD K6 is recommended but MMX is even better.
- **Available bandwidth.** ISDN is great. A 28.8 modem (or higher) will work, too. Using a 14.4 modem is definitely not recommended.
- **Type of video capture device.** Capture cards are better than parallel and serial port cameras.
- **Operating system.** Windows 95 may be faster than Windows NT, depending on hardware configuration, memory, and the number of services running.
- **Size of video.** The smaller the video, the faster.
- **Amount of video scaling.** A size of 100 percent is the most efficient.
- **Image complexity.** Solid background and solid clothing work best.
- **Amount of movement.** More movement causes more data to be transmitted.

SAMSUNG EXHIBIT 1017, Page 305

- **Compression amount.** More compression is faster but "blurry."
- **Lighting.** Good lighting helps video performance and quality.

Also consider that there may be a lot of traffic on the Internet or on your network during your NetMeeting conference. If you use the Internet at 2:00 AM you will find that it is much faster than at 8:00 in the evening when everyone is home browsing. If you are using a commercial online service such as CompuServe or America Online, you may always experience performance problems, because their systems are not designed to handle a constant stream of data going in both directions.

Slow Video

The speed of your computer's processor and the type of video equipment you are using can affect video performance. Computers with a bi-directional (ECP or EPP) parallel port perform noticeably better with parallel video cameras than computers with a uni-directional parallel port. Most new computers come with bi-directional parallel ports. You have to go into the system BIOS settings to see if you have the port set to this mode. Your computer should tell you during boot up how to access the system BIOS. You typically have to press the Delete or Escape key during the memory test to enter the system BIOS settings. In the Peripheral setup, you should see a setting for the parallel mode. If you do not see this option, then your computer does not support this type of port.

Additionally, if you use NetMeeting's video features in a dark area, some cameras might cause your computer to become extremely slow and unresponsive. This is due to additional processing that may be required because of the low-light conditions. Try closing other applications or minimizing the My Video window to improve video performance. Also, you might improve performance by reducing the video quality, which increases the compression and frame rates. Figure 16-4 shows the Video tab on the Options dialog. To change the video quality, follow these steps:

1. On the main menu, click Tools and and then click Options.
2. Select the Video tab and move the "Video quality" slider to change the amount of compression.

NOTE

Cameras that connect to a video capture card use less of your computer's processor than cameras that connect through your computer's parallel port.

SAMSUNG EXHIBIT 1017, Page 306

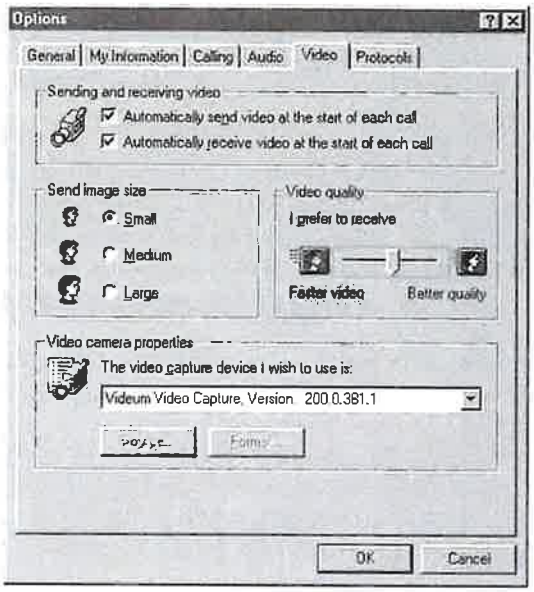


Figure 16-4. *Setting the video quality and compression.*

For higher frame rate but lower-quality (blurry) images, increase the compression and frame rates by moving the slider toward low (to the left). For slower performance but higher-quality images (clearer), decrease the compression and frame rates by moving the slider toward high (to the right). Note that this setting only affects the video quality received by you. You cannot control the quality of the video that you send.

Poor Video Quality During a Conference

If the quality seems to be poor in the video windows during a conference, any of the following may be the culprit:

- You have selected to transmit a large image size and the computer cannot process the video fast enough.
- You have selected to transmit a large image size, but there is not enough available bandwidth.
- The video quality is set to low, which is the default setting if you selected a 28.8 Kbps modem during the setup.
- You may not have enough light in the area. Good lighting around the subject always helps the quality and the performance.

SAMSUNG EXHIBIT 1017, Page 307

- You are doing large file transfers or sharing applications that are taking up the bandwidth of your connection. Your bandwidth is shared between all of NetMeeting's features.

Make sure that there is sufficient lighting for the camera. Then, try closing other applications to improve image quality. Also, you might improve image quality by changing the size of the image. On a computer using a slower processor, smaller images process better than larger images.

To change the image size you need to change the video options in the NetMeeting Options dialog, shown previously in Figure 16-4. Follow these steps to change the image size:

1. On the main menu, click Tools and then click Options.
2. Select the Video tab.
3. In "Send image size", select the desired size.

FROM HERE...

This chapter discussed how to fix some of the common problems with video capture devices and NetMeeting. You also learned how to increase the performance and quality of a video conference.

If you are still having trouble, you should refer to the following chapters or contact the manufacturer of your capture equipment.

- Chapter 7, "Video Conferencing," discusses the entire video process and how to use the video features of NetMeeting. Understanding how this process works can help you solve problems when they happen.
- Chapter 15, "Troubleshooting Audio," focuses on fixing problems with the audio component of NetMeeting. Audio and video trouble can be related, so check out this chapter for help.
- Chapter 17, "General Troubleshooting Techniques," covers general troubleshooting with NetMeeting.

SAMSUNG EXHIBIT 1017, Page 308

Chapter 17

General Troubleshooting Techniques

In this chapter, you will learn:

- **The basics.** Learn the basic strategies to solve almost any NetMeeting problem. Discover the best way to search for, identify, and isolate the problems that keep NetMeeting from running smoothly.
- **Common problems.** You'll find solutions for the most common problems, from downloading, installation, and setup, to font troubles and SpeedDial shortcuts.
- **Networking problems.** Problems bring NetMeeting to a halt. Is your directory server down? Could it be an invalid IP address? Read this section to help pinpoint your network configuration problems.
- **NetMeeting feature trouble.** NetMeeting's sophisticated features may take some tweaking. Difficulties relating to application sharing, file transfer and the Whiteboard are examined.

SAMSUNG EXHIBIT 1017, Page 310

Getting every piece of NetMeeting to work the first time may not be possible for some people. If you are reading this, you are probably one of those users. There are so many options and features that it's easy for something to go wrong. This chapter is designed to help you figure out the most common problems that people have with NetMeeting. I also go through some basic troubleshooting strategies that can help you determine and solve almost any problem with NetMeeting.

> **TIP**
>
> If you are having trouble with NetMeeting's audio or video features, I suggest that you refer to Chapter 15, "Troubleshooting Audio," or Chapter 16, "Troubleshooting Video."

TROUBLESHOOTING 101

You can follow some basic steps to troubleshoot NetMeeting problems. Troubleshooting is considered an art form by many people, and troubleshooting software is no different. These tips will not only help you solve problems with NetMeeting, but they can be applied to almost anything. I bet you didn't think this book would help you so much when you picked it up. Here are the basic steps that you should follow to solve any problem with NetMeeting:

1. Identify the problem at hand. This can be as simple as "It just won't connect."
2. Check whether the problem is discussed in this chapter or in the other troubleshooting chapters. Also check the online Troubleshooting Guide that is part of NetMeeting.
3. If you have several problems, isolate one problem at a time and test the conditions that cause it to occur.
4. If you cannot fix the problem, check the online knowledge base and support. See Appendix B, "Additional Online Information," for a list of online support options.

Identify the Problem at Hand

Determining the exact nature of the problem can be a simple but crucial part of starting the troubleshooting process. If you don't get this part right, then the rest

SAMSUNG EXHIBIT 1017, Page 311

of the steps are pointless. Why solve the wrong problem? Consider the following when you start troubleshooting any problem with NetMeeting:

- Are you presented with any error messages?
- At what point of your work with NetMeeting does the problem happen?
- Can you reproduce the problem or does it happen randomly?
- Is the problem specific to a NetMeeting feature like audio, video, or application sharing?
- Do other applications have the same problems?
- Have you changed the hardware configuration of your computer?
- Have you changed any of the settings on your computer?
- Have you installed any other new software?
- Did NetMeeting work before? If it did, what might have changed?
- Does your computer meet the minimum hardware system requirements for NetMeeting? Refer to Chapter 2, "Preparing Your System," for system requirements.

Checking for Common Problems

Check whether the problem is commonly reported and described in this or the other troubleshooting chapters (Chapters 15 and 16) or in the online help for NetMeeting. The NETMEET.TXT file, which is installed in the NetMeeting folder, contains the most recent bug reports and known problems with the latest version of NetMeeting. You can view this file with Notepad. The online help also includes several troubleshooting aids for solving common NetMeeting troubles. To access the online troubleshooting help, follow these steps:

1. On the main menu of NetMeeting, click Help, then Help Topics.
2. Select the Contents tab and click Troubleshooting, then Open.
3. Next, select "If you have trouble using NetMeeting" and click Display.
4. Click the appropriate button that describes your problem.

Isolating the Problem

It is easier to deal with one problem at a time. One key to good troubleshooting is narrowing down a big problem to many little ones or isolating several problems that happen at the same time. You can resolve a problem more quickly

SAMSUNG EXHIBIT 1017, Page 312

by systematically isolating and testing the error conditions. You can use the following methods to help you isolate the error conditions:

- Eliminate other external variables. You may want to close all other running applications so that you can eliminate the possibility that they are interfering with or causing the problem in NetMeeting.
- Isolate the cause by changing a specific configuration value and testing whether the change makes any difference. A good example is switching between full- and half-duplex audio to resolve audio problems.
- If the software fails after you have added new hardware or software, remove the new hardware or uninstall the software to see whether that solves the problem. A common problem is adding a new video capture card that conflicts with other hardware in your system. Take it out and verify whether it is, in fact causing the problem.

Test each modification individually to see whether the change resolves your problem. Make note of all modifications and their effect on symptoms. If you contact product support personnel, this information helps them troubleshoot your problem. Also, the information provides an excellent reference for future troubleshooting.

Check Online Troubleshooting and Support

A variety of online support options are available to you. Other users may have discovered the same problem that you are having, reported it, and found solutions. It will save you time if you use this valuable resource to resolve problems with NetMeeting. You can access the online support page by following these steps:

1. On the main menu, click Help.
2. Click Online Support and the Technical Support page will display in your Web browser. This page contains the most updated information about troubleshooting and other online support options.

WEB ALERT

The link for the online support page is: http://www.microsoft.com/iesupport/netmeeting/.

SAMSUNG EXHIBIT 1017, Page 313

COMMON PROBLEMS, QUESTIONS, AND ISSUES

This section describes common problems that NetMeeting users have reported and provides helpful information for responding to problems, questions, and issues. Remember that for a conference to begin, you and the person whom you are calling must:

- Have an active connection to the Internet or a shared corporate network;
- Run NetMeeting on your computer;
- Allow NetMeeting to accept calls and manually accept the call when it comes in.

Another T.120-Compliant Conferencing Application Is Running

NetMeeting conforms to the International Telecommunications Union (ITU) T.120 conferencing specification. It is compatible with other conferencing programs that are based on this specification, but it cannot run while another program based on this specification is running on the same computer. If you attempt to start NetMeeting when another T.120-compliant conferencing program is running, NetMeeting may stop responding (hang) or the following error message may be displayed: "Microsoft NetMeeting cannot start because this computer is already running another conferencing application. Please close the other application and try again."

To work around this problem, close all other T.120-compliant conferencing programs before attempting to start NetMeeting. If you are not sure whether another T.120-compliant conferencing program is running, close all other programs and attempt to start NetMeeting.

The same error can be caused if NetMeeting terminated abnormally and part of the application is still running. The only way to fix this is to reboot your computer and start NetMeeting again.

Damaged TrueType Fonts

When NetMeeting begins, all of the fonts installed on the computer are processed so NetMeeting can determine how to handle fonts that may not be installed on conference participant computers when applications are shared. If any of the

SAMSUNG EXHIBIT 1017, Page 314

TrueType fonts are damaged, NetMeeting may stop responding (hang) when you attempt to start it.

To verify that there are no damaged TrueType fonts, double-click Fonts in Control Panel and then double-click each TrueType font in the Fonts folder. If your computer hangs when you double-click a font, that font may be damaged. If you encounter a damaged font, drag it from the Fonts folder to another folder. Once you have confirmed that a particular font is the cause of the problem, you can delete the font. If the font is required or one you want to use, reinstall the font from the appropriate source.

Access Violation Error Occurs While Downloading NetMeeting

While you download NetMeeting, you may receive an Access Violation error message. This error can occur if the downloaded file becomes damaged. You can resolve this problem by downloading NetMeeting again. If the download seems to finish very rapidly, empty your browser's cache and download again. You will then receive a new complete copy of the program.

Conference Hangs While Close Program Dialog Box Displays

When you are in a conference and one of the conference members opens the Close Program dialog box (by pressing Ctrl + Alt + Del), other conference members receive no response from the computer that's displaying the Close Program dialog box. This causes all programs to be suspended while the dialog box is displayed. If you need to open the Close Program dialog box, notify the members of your conference that you will be unavailable and that they should not attempt to contact you during this time.

No Error Message but NetMeeting Setup Does Not Finish

When you try to install Microsoft NetMeeting on a drive with insufficient disk space, you may receive the following message: "To install this program, you need 14,000 KB disk space on drive C:. It is recommended that you free up the required disk space before you continue. Do you still want to continue?"

If you click Yes, the setup process appears to continue and finish, but the program may not set up successfully. To resolve this problem, free at least 16 MB of space on the destination drive, and run NetMeeting Setup again. Installation of NetMeeting will place files in your system directory (WINDOWS\SYSTEM) and in the installation directory that you choose. So make sure there is space in both areas.

SAMSUNG EXHIBIT 1017, Page 315

Cannot Open FrontPage Configuration Files

After you install Microsoft NetMeeting, when you attempt to open a Microsoft FrontPage version 1.x configuration file for editing, the SpeedDial tool in Microsoft NetMeeting opens. NetMeeting associates files with a CNF extension with the SpeedDial tool, which is the same extension that FrontPage is expecting. To edit a FrontPage configuration file, use any text editor (such as Notepad) to open the file.

Cannot Modify SpeedDial Properties

When you view the properties for a SpeedDial shortcut in the SpeedDial folder, the only changes you can make are for the file attributes. If you need to change the properties for a SpeedDial shortcut, use one of the following methods:

- Delete the icon from the SpeedDial folder and create a new icon using the Create SpeedDial command on the Call menu.
- Edit the shortcut by using a text editor, such as Notepad, to open the .cnf file in the SpeedDial folder and edit the "Address=" line.

  The format of the Address line is:

```
Address=<Server name>/<User address>
```

The Send to Mail Recipient Option Is Unavailable on SpeedDial Shortcuts

When creating a SpeedDial shortcut, you cannot select the "Send to mail recipient" option. Instead, you can choose only to save the shortcut on the desktop.

This happens if you do not have a mail application program interface (MAPI)-compliant mail client installed. Install a MAPI-compliant mail client. Examples of MAPI-compliant mail clients include:

- Microsoft Exchange
- Microsoft Windows Messaging
- Microsoft Outlook Express
- QualComm Eudora

SAMSUNG EXHIBIT 1017, Page 316

CONNECTING TO THE ILS AND OTHER NETWORKING PROBLEMS

When you use NetMeeting and try to connect or reconnect to a directory server using an Internet Locator Server (ILS), you may receive one or more of the following error messages:

- "The User Location Server could not be found. Your information will not be available to others."
- "There was a problem connecting to the Directory Server. Please choose another server."

However, you may be able to view the directory server with your Web browser. These types of connection problems can be caused by any of the following situations:

- The directory server may be down.
- You are using a 16-bit Winsock connection to your Internet service provider (ISP).
- You are connected to the Internet using a proxy server.
- You recently closed NetMeeting.

If your directory server is down, try again later or use a different server. If you are using a 16-bit Winsock connection, contact your ISP to see whether a 32-bit version is available, or use dial-up networking to establish the connection.

If you are using a proxy connection, have your network administrator check the proxy settings. Refer to Chapter 11, "Configuring Corporate Firewalls," for more information on how to configure a proxy server with NetMeeting. Use port 389 for ILS and port 522 for ULS. If you recently closed NetMeeting, wait a few minutes before attempting to reconnect to the directory server.

Determining Whether Your Directory Server Is Down

Try to ping the server. When you are connected to your ISP, type

```
ping <name of the directory server>
```

at a command prompt, and press Enter. If you do not get a reply, the directory server may be down, or your Domain Name Service (DNS) configuration may be invalid. If you get a reply, try using the Internet Protocol (IP) address as your directory server.

SAMSUNG EXHIBIT 1017, Page 317

Determining Whether Your Connection Is 16-Bit or 32-Bit

When you are connected to your ISP, type "winipcfg" at a command prompt, and press Enter. If the information displayed in the fields is all zeros when you are connected to your ISP, you are probably using a 16-bit version of Winsock.dll.

Check whether your ISP can work properly with a 32-bit version of Winsock.dll. If appropriate, upgrade to the 32-bit version. The Dial-up Networking tool included with Microsoft Windows 95 and Microsoft Windows NT 4.0 uses a 32-bit connection.

The ILS Is Unavailable

Be sure to verify whether the ILS to which you are attempting to connect is available before you perform any additional troubleshooting steps. To verify whether the ILS is available, contact the ILS administrator or attempt to connect to the ILS from another computer that you know can connect to another ILS.

If the ILS is not available, you may want to configure NetMeeting to use a different ILS. To do so, click Options on the Tools menu in NetMeeting, click the My Information tab, and type the name of a different ILS in the Directory Server box.

Double-Bound TCP/IP Protocol

If you have bound the TCP/IP protocol to both your network card and the dial-up adapter, the multihoming feature of the TCP/IP protocol may not function correctly. It may prevent you from connecting to an ILS. To determine whether the TCP/IP protocol is bound to your network card and the dial-up adapter, double-click Network in Control Panel. If the list of installed network components includes two lines that are similar to the following lines, the TCP/IP protocol is bound to both your network card and the dial-up adapter:

```
TCP/IP -> Dial-up Adapter

TCP/IP -> Intel EtherExpress Pro 16
```

To work around this problem, unbind the TCP/IP protocol from your network card before you attempt to connect to an ILS. To do so, follow these steps:

1. In Control Panel, double-click Network.
2. Click the instance of the TCP/IP protocol that corresponds to your network card in the list of installed components, and click Properties.
3. Click the Bindings tab, click all check boxes on the Bindings tab to clear them, and click OK.

SAMSUNG EXHIBIT 1017, Page 318

> **CAUTION**
>
> Changing these settings will affect your ability to use your network resources. Check with your system administrator if you are not sure about making changes to your network settings.

If unbinding the TCP/IP protocol from your network card does not correct the problem, you may want to try using the Winipcfg.exe tool to release all IP addresses assigned to the network adapter before you attempt to connect to an ILS. To do so, follow these steps:

1. Click the Start button, and click Run.
2. Type "winipcfg.exe" in the Open box, and click OK.
3. Click your network card in the IP Configuration dialog box that appears, click Release, and click OK.

Recently Closed NetMeeting

By default, NetMeeting sends a termination message on closing that tells the ILS to remove the user name. This normally takes less than one minute. If for some reason the ILS does not receive this termination message, your name will remain on the user list for about 5 minutes. This can happen if your NetMeeting session ends abnormally or your network connection is interrupted. In both cases, NetMeeting never had a chance to send the termination message to the ILS.You cannot reconnect to the ILS until your user name has been removed from the listing.

To work around this problem, wait a few minutes before attempting to reconnect to the ILS server. The ILS will automatically remove you from the list if it detects that you are not online after a certain time period.

An Invalid IP Address

If the saved NetMeeting connection in the SpeedDial refers to an IP address that is no longer valid for the person you are trying to call, you will not be able to connect to that person. To work around this problem, connect to the ILS again to find the current IP address of the person you want to call.

After you click a person listed on a ILS using your Internet browser, you have the option to call or save a connection to anyone logged into the server. If you choose to save the connection so you can dial it later, NetMeeting creates a file, with an ILS extension, that includes the information needed to connect to that person. These saved connections use the IP address of the person when they were connected to the ILS.

SAMSUNG EXHIBIT 1017, Page 319

Many Internet service providers and corporate networks are configured to use dynamic addressing, which may not assign the same IP address to a user each time he or she connects to the Internet or network. This creates an obvious problem with a SpeedDial that references a specific IP address. Some Internet service providers can provide you with a static IP address, which eliminates this problem.

Web Directory and NetMeeting Home Page Options Are Not Functional

After starting NetMeeting, you try to click a menu option. Both the toolbar buttons and the menu commands on the Web directory and NetMeeting home page do not respond. This can occur if one of the following conditions exists:

- Your Web browser has not registered itself properly with Windows.
- Your browser does not support the required Hypertext Transfer Protocol (HTTP) shell extension.

To solve this problem install an Internet browser, such as Microsoft Internet Explorer, that registers properly and supports the HTTP shell extension. This shell extension enables you to access a World Wide Web page by typing an HTTP address from the Run command on the Windows 95 or Windows NT Start menu. If your Internet browser registers properly with Windows 95 or Windows NT but does not support the required HTTP shell extension natively, you can install Microsoft Internet Explorer to add this functionality. By keeping your original browser as the default, you can use the Web directory and NetMeeting home page options.

DIALING AND CONNECTING

Getting connected to another NetMeeting user can be a difficult problem to solve. This section covers some of the most common troubles encountered when trying to connect with someone. Chapter 4, "Making Your First Call," contains more detailed information about placing a call and connecting.

NetMeeting Does Not Accept Incoming Calls

During a NetMeeting session, a dialog box notifies you of an incoming call. One of two conditions might exist:

- You cannot accept the incoming call by pressing Enter because the NetMeeting window displays an existing dialog box, such as Place Call.

SAMSUNG EXHIBIT 1017, Page 320

- You cannot accept the incoming call using the keyboard or mouse because another meeting participant currently controls a shared program and, therefore, controls keyboard and mouse functions.

This occurs because of the way Windows processes dialog boxes. The Place Call dialog box is a system modal dialog box that requires user input before the system can continue. You must close these modal dialog boxes before Windows allows normal keyboard input into nonmodal dialog boxes, such as the dialog box generated by an incoming call in NetMeeting.

In addition, the dialog box generated by an incoming call might not become the active dialog box if another meeting participant controls a shared program. Therefore, you cannot press Enter or use the mouse to accept the call because the other meeting participant controls the keyboard and mouse pointer functions.

If you cannot accept an incoming call because another meeting participant currently controls a shared program, press Alt + Tab to switch to NetMeeting, and press Enter to accept the call. You can also configure NetMeeting to accept incoming calls automatically.

To configure NetMeeting to accept incoming calls automatically, follow these steps:

1. On the Main Menu, click Tools and then Options.
2. In the Incoming Calls area on the General tab, check the "Automatically accept incoming calls" check box to enable this option.

> **NOTE**
>
> You can use the Spacebar to accept incoming calls when another dialog box is open in NetMeeting, but you cannot use the keyboard to ignore incoming calls in this manner. You must first close the other dialog box to ignore the call.

The Person You Called Is Not Able to Accept Calls

When you attempt to place a call using NetMeeting, you may receive the following error message: "The person you called is not able to accept NetMeeting calls." To place any call, you must have selected an installed, working protocol and an installed, working device (such as a modem or network adapter). To resolve this error, check these items:

SAMSUNG EXHIBIT 1017, Page 321

- Using standard network troubleshooting methods, verify that the protocol or device required is installed and working.
- If necessary, install the missing device or protocol and restart NetMeeting.

When you try to call someone listed on the ILS, you may receive one of the following error messages:

- "User did not accept your call."
- "User is unable to accept NetMeeting calls."

These error messages can occur if any of the following situations exist:

- You are not connected to the Internet.
- The other party is not accepting your calls.
- The person whom you are calling is not running NetMeeting or is not connected to the Internet.
- NetMeeting has become damaged and needs to be reinstalled.

Verify that you are connected to the Internet and that the person you are trying to call is also connected to the Internet and running NetMeeting. If the problem persists, try to connect with different users. If you are unable to connect with anyone, you may have damaged files. Remove and reinstall NetMeeting.

Windows Attempts to Dial when Started

After installing NetMeeting, you restart your computer and Windows displays a Connect To dialog box instructing you to dial your Internet service provider. This occurs when all of the following conditions exist:

- The "Run when Windows starts and notify me of incoming calls" option is enabled.
- Your computer is not directly connected to the Internet (that is, you are using a modem for Internet access).
- Your browser is set up to dial automatically when it starts.

If you enable the "Run when Windows starts and notify me of incoming calls" option, NetMeeting will load as part of the startup procedure and will attempt to locate the ILS server on startup. Windows recognizes the request to connect to the server as an HTTP address and starts your World Wide Web

SAMSUNG EXHIBIT 1017, Page 322

browser to make the Internet connection. To resolve this, disable the "Run when Windows starts and notify me of incoming calls" by performing these steps:

1. On the NetMeeting main menu, click Tools, then Options.
2. In the Incoming calls area of the General tab, clear the "Run when Windows starts and notify me of incoming calls" check box.

APPLICATION SHARING

Using the application sharing feature can add a lot to a NetMeeting session, but it can also introduce a set of problems. This section covers problems that can occur when you use this feature of NetMeeting. Refer to Chapter 8, "Application Sharing and File Transfer," for additional information about how to use application sharing during a conference.

Programs Inadvertently Shared when Sharing Windows Explorer

When you share an instance of Windows Explorer, Control Panel, Briefcase, My Computer, or another Windows Explorer-based program with Microsoft NetMeeting, all Windows Explorer-based programs that are currently running are automatically shared. In addition, after you share a Windows Explorer-based program with NetMeeting, any other programs that you start are automatically shared. To work around this problem, use one of the following methods:

- If a program that you do not want to share is automatically shared, manually stop sharing it. To do so, point to Share Application on the Tools menu, and click the program that you want to stop sharing.
- Do not share Windows Explorer during a NetMeeting session.

Sharing Full-Screen and Graphics-Intensive Programs

When you share a graphics-intensive program with Microsoft NetMeeting, the program may not display properly on other computers participating in the meeting. In addition, when you share a program that is running in full-screen mode, the program may appear differently on other computers participating in the meeting. The program may not display properly, or the program's window may be minimized.

Many video clips, graphics-intensive games, and other programs based on DirectX, DirectDraw, OpenGL, Video for Windows, or other similar technologies

SAMSUNG EXHIBIT 1017, Page 323

do not display properly when shared with NetMeeting. This known limitation of NetMeeting is most likely to occur when a video clip or graphics-intensive game or other program runs in a full screen, but it can also occur when the video clip or program runs in a window.

When a shared Windows-based program (such as Microsoft 3D Pinball) runs in full screen mode, NetMeeting will display a program window to all of the other computers who are in the meeting. If the Windows-based program is graphics-intensive, however, the contents of the Window may not be displayed properly to all of the participants because of the volume of information that must be transmitted. When a shared MS-DOS-based program (such as the MS-DOS Editor) runs in full screen mode, the window will be shown as a minimized program on the participating computers. So the full screen MS-DOS program will not be displayed to the members of the conference.

If you are unable to reliably share a particular video clip, graphics-intensive game, or other program, you should not share the video clip or program using NetMeeting.

Slow Performance in NetMeeting when Sharing Graphics

When you share a program that uses a large number of graphics, you may notice a decrease in performance that worsens with the number of members in the conference. This is due to the amount of information that must be transmitted to the participants. NetMeeting intercepts calls made to GDI, the Windows Graphical Display Interface, and transmits them to the other members of the conference. In this process, graphical resources are used and may slow the performance noticeably, depending on the amount of information being intercepted and transmitted. Use any of the following methods to improve performance:

- Decrease the number of participants.
- Increase the network speed. You can use a faster modem or lower the amount of traffic on the network (this may not be a practical solution).
- Close all unneeded programs that are running.

Sharing Programs Enables Other People to Access Your Files

NetMeeting enables you to share a program with other people in an online meeting. Depending on the program you share, their ability to use the program might include the ability to access your files. For example, if you can open files

SAMSUNG EXHIBIT 1017, Page 324

from your hard disk when using a program on your computer, the other participants can also open files from your hard disk when using the same program from their computers.

When you share a program in Microsoft NetMeeting and use the collaboration capabilities, other meeting participants can access files on your hard disk. Their ability to access your files might include the ability to create new files or open, modify, move, or delete existing files. Other meeting participants can access your files in this manner, regardless of whether you share the files on your computer.

Other participants can use features of the shared program to control hardware devices (for example, to print a file); however, they cannot share applications that report status for these devices (for example, the Background Print Monitor). Because sharing a file on your hard disk does not affect your ability to access the file locally, another person can access the file when you share a program with NetMeeting. You can take precautions to prevent additional access when sharing an application:

- You can stop someone from using your shared program while you do not have control of the cursor by pressing the Escape (Esc) key.
- Don't leave your computer unattended while you are in a session in which application sharing is enabled.

You Are Unable to Save Files in a Shared Application

During a conference, you can view and update a file shared by another participant, but you cannot print the file or save it to your own computer. This is because these functions only work on the computer that shared the application. To resolve this situation, ask the person who shared the program to send a copy of the file to everyone in the meeting. To send a copy of the file to all meeting participants, follow these steps:

1. On the main menu, click Tools, File Transfer, and Send File. Or you can press Ctrl + F to accomplish the same thing.
2. Send the file to all or select the names of the participants whom you want to have the file.
3. Locate and select the file you want to send.
4. Click Send.

Also, you can transfer a file by dragging the file's icon onto the NetMeeting main window. After you transfer a file, recipients see a standard warning dialog box that provides the following options: Open, Close, and Delete. If a participant accepts the

SAMSUNG EXHIBIT 1017, Page 325

file, the default destination is the PROGRAM FILES\NETMEETING\RECEIVED FILES folder.

Part of the Shared Window Is Masked

During a conference, you view a shared application from another participant. A bitmap window covers part of the shared application window, masking your view of the shared information. The person sharing the application has a second, unshared window covering the shared window. To prevent this problem, keep overlapping windows to a minimum. See Chapter 8 "Application Sharing and File Transfer," for an example of this behavior.

FILE TRANSFER

This section covers some of the problems that you might encounter when using the file transfer feature of NetMeeting. You can use this feature to send files to the participants of a meeting. You may also want to consider using a virus scanner, such as McAfee VirusScan on any files that you receive during a NetMeeting session.

Unable to Receive Files Using File Transfer

You might receive the following error message on the sending computer: "There was a problem transferring the file." This behavior can occur if either of the following conditions exists:

- NetMeeting is configured to receive files on a mapped network drive or removable media, and you do not have the ability to write to that network drive or removable media.
- There is not enough free disk space for the file.

The solution in this case is to change the location where files are received. To do so, follow these steps:

1. On the Tools menu, click Options.
2. On the General tab, change the setting in the "Save files sent to me" in the dialog box to a folder you can write files to.

   The default folder for incoming files is:

```
PROGRAM FILES\NETMEETING\RECEIVED FILES
```

If you change this folder, make sure there is enough free space and that you can write files in the folder. If you select a folder on a removable media, make sure the appropriate media is inserted when the file transfer is started.

SAMSUNG EXHIBIT 1017, Page 326

TROUBLESHOOTING THE WHITEBOARD

The Whiteboard allows a group of people to mark on a common space using text, brushes, and other graphical objects. This section covers some of the problems that can arise when you are using this feature of NetMeeting. For more information about this feature refer to Chapter 5, "Chat and Whiteboard."

Pasting a Bitmap into the Whiteboard Might Alter the Image

When you paste a bitmap into the NetMeeting Whiteboard, the image might appear damaged or altered from the original version. Some color intensive bitmap images might not display well on the Whiteboard, but the actual image file is not damaged. Try sending the graphic file to the members of the conference to correct the problem. They can then use another program such as Internet Explorer to display the graphic file.

Text in Whiteboard Is Not Visible

When you type text in the Whiteboard tool, the text may not be visible if you place the mouse pointer near the top of the Whiteboard screen. After you click the Text button, move the mouse pointer away from the top of the Whiteboard screen. The text will then remain visible as you type.

Unpredictable Colors when Using the Highlight Pen

When you use the Whiteboard highlight pen, you might experience the following symptoms, depending on the combinations of colors used:

- Your pen might not overwrite the highlight color drawn by another participant.
- Your pen might not appear to work or might change the colors of a bitmap to a dark color.

These problems occur because NetMeeting optimizes the Whiteboard tool for a yellow highlighter on a white background. The best solution is to experiment with different colors to find combinations that work for all participants without affecting the usefulness of the Whiteboard tool. If you often use a bitmap on the Whiteboard, you might find that bitmaps with white backgrounds produce better results when you use the highlighter pen.

SAMSUNG EXHIBIT 1017, Page 327

Cannot Open a Saved Whiteboard File

When you double-click a saved Whiteboard (.wht) file or use the right mouse button to click the file and then click Open, the file may not open. When this occurs, you receive no error message. This is because the Whiteboard tool is already running. By design, you can run only one instance of Whiteboard at a time. To open a saved Whiteboard file, use one of the following methods:

- Drag the Whiteboard file to the open Whiteboard session.
- Switch to the current Whiteboard session by clicking its icon on the taskbar, click Open on the File menu, click the file you want to open, and then click Open.
- Close the current Whiteboard session, then double-click the Whiteboard file you want to open.

FROM HERE...

This chapter covered problems commonly encountered with many of NetMeeting's features. Hopefully, you found the problem that you were experiencing and it has been resolved. If not, check the chapter relating to the feature that you are having trouble with.

You may want to check the following chapters for additional detailed troubleshooting information on video and audio:

- Chapter 15, "Troubleshooting Audio," focuses on solving problems relating to the audio feature of NetMeeting. If you are having trouble sending or receiving audio then you should read this chapter.
- Chapter 16, "Troubleshooting Video," covers the problems and solutions for the video feature of NetMeeting.

SAMSUNG EXHIBIT 1017, Page 328

Part V

NetMeeting Resources



Chapter 18

Products That Extend NetMeeting

In this chapter, you will learn:

- **Where to find Web sites that will teach you more about NetMeeting.** There are already several good information sources about NetMeeting on the World Wide Web, with more arriving often.
- **Where to find NetMeeting newsgroups.** Newsgroups are places where you can ask other enthusiasts questions, post experiences, and even make friends. I'll show you how to get to the most popular places.
- **The audio and video products that work with NetMeeting.** There are many audio and video products that work with NetMeeting. I cover the field for you and get you started on your shopping spree for more hardware.
- **Products that enhance NetMeeting.** There are several dozen products designed for NetMeeting. Some enhance audio, others enable multipoint video. Read the product guide in this chapter to see if there's a NetMeeting add-on for you.

SAMSUNG EXHIBIT 1017, Page 332

I'd like you to think that this book is the be all and end all of NetMeeting information sources, but it's not. While researching this book, I've found several Web sites and information sources that might be helpful in your search for new information and new ways of using NetMeeting.

I assume that you've already visited the main NetMeeting Web site at http://www.microsoft.com/netmeeting/ but you may not realize just how much information it offers (and Microsoft posts new additons all the time). In fact, if you really like NetMeeting, you should check back there every month or so, because Microsoft releases new information and updates to NetMeeting quite often. I'll take you on a quick tour of what you can find on the Microsoft site, because there is so much information for NetMeeting users.

Later on in this chapter, we'll take a look at the various products that other companies have released for use with NetMeeting.

NETMEETING ONLINE SUPPORT

The first stop for many people is the online support page for NetMeeting. Online technical support for NetMeeting includes a Knowledge Base, Troubleshooting Wizards and downloadable files. This page also has a link to the online Frequently Asked Questions (FAQ).

The link to NetMeeting's online technical support is rather complex because, like all Microsoft products, the support is located in a huge online database that is accessed through active server pages. There are two easy ways to access the online technical support for NetMeeting. The first is to go to the NetMeeting Web site (previously mentioned) and click on Support in the leftmost frame. You may also run NetMeeting and click Online Support in the Help menu. Both of these options will bring you to the entry point of the NetMeeting online support, as shown in Figure 18-1.

The Knowledge Base is the best place to go for information on any Microsoft product (there are thousands of pages of information here, with more than 100 pages of information about NetMeeting alone).

If you are having trouble with NetMeeting, and the troubleshooting chapters in this book didn't help solve your problem, try the NetMeeting Troubleshooter page at: http://support.microsoft.com/support/tshoot/NetMeet.asp. This page will take you step-by-step through NetMeeting's thorniest issues (see Figure 18-2).

If you are a corporate user, or would just like to learn more about NetMeeting's technical side, download the NetMeeting Resource Kit from http://www.microsoft.com/netmeeting/reskit/. The Resource Kit includes information about how to set up a firewall to allow NetMeeting use and it also provides lots of information about the amount of bandwidth NetMeeting uses.

SAMSUNG EXHIBIT 1017, Page 333



Figure 18-1. *The NetMeeting online technical support page can help you solve problems.*

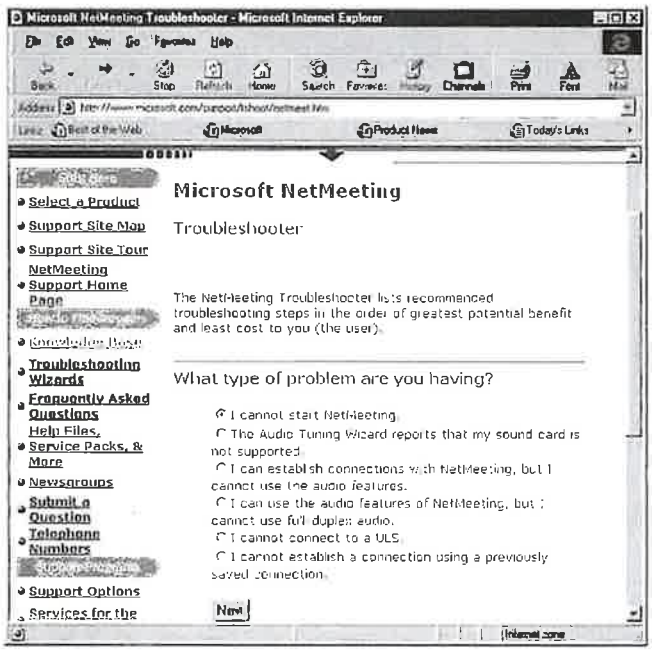


Figure 18-2. *The NetMeeting Troubleshooter page will help you solve the thorniest problems with NetMeeting.*

SAMSUNG EXHIBIT 1017, Page 334

After you've visited all of Microsoft's NetMeeting information sources, you might want to try some of the third-party information sources.

There's the "NetMeeting Place" Web site that was developed by contributor Robert Scoble at http://www.netmeet.net. It includes a comprehensive list of ILS directories (more than 100 at press time) and a lot more of information for NetMeeting users (see Figure 18-3).



Figure 18-3. *The NetMeeting Place is a useful Web site, especially if you are looking for other ILS directories to use.*

While we are talking about ILS directories, there are a few companies that are making their ILS directories a part of their content offerings. These include:

- `http://www.populus.com`
- `http://www.bigfoot.com`
- `http://www.whowhere.com`
- `http://www.four11.com`

Four11 has the first Net Phone Directory services for all products supporting the H.323 standard, which helps people connect with one another more easily. You

SAMSUNG EXHIBIT 1017, Page 335

can search the Four11 directory to find specific people, as well as to find NetMeeting users with similar interests and hobbies.

Populus is a great place to find someone on NetMeeting. They host a good database for you to search for friends and family, and they have an ILS server, too.

Bigfoot has a comprehensive suite of server-based products for email users. The Bigfoot Directory has more than 8 million email addresses and 110 million white page listings. Bigfoot also has a major ILS server.

WhoWhere? puts NetMeeting users into one easy-to-use, browsable directory, which eliminates the need to search multiple ILS servers.

Some of you might like to know a little more about the video, audio, and data sharing standards that NetMeeting complies with, and where those standards come from. The International Multimedia Teleconferencing Consortium Website, http://www.imtc.org/, explains all about the H.323, T.120, and the other standards that NetMeeting uses.

Microsoft Newsgroups

Finally, there's the best resource of NetMeeting information: Microsoft's Support Newsgroups. You can access the NetMeeting newsgroup on the Microsoft news server at msnews.microsoft.com. The following newsgroups are available on this news server:

- `microsoft.public.inetexplorer.ie4.netmeeting`
- `microsoft.public.internet.netmeeting`
- `microsoft.public.internet.netmeeting.beta`

An Internet news reader program is required to access these newsgroups. You can also follow the Newsgroups link on the online support page, mentioned earlier in this chapter, to access the NetMeeting newsgroups.

Newsgroups are online message bases where you can post a message asking a question, and pretty quickly you'll get an answer, either from other NetMeeting users (as is usually the case) or from Microsoft's technical support staff.

It's most helpful if you follow a few simple rules when you ask a question in a newsgroup. By following these rules, you'll have a very good chance of getting an answer from another NetMeeting user and that answer will be more complete and accurate:

- Post with a specific subject line. Don't just say "Help Me" in the subject line. Say instead: "Full-duplex problem with SoundBlaster AWE32 card." It's important that you include the hardware or software that's causing your problem and try to include a little bit about the symptom

SAMSUNG EXHIBIT 1017, Page 336

of the problem too. This way, other SoundBlaster users can come to your rescue, and you won't waste the time of people who aren't familiar with SoundBlaster cards.

- Include as much detail about the problem as possible, especially the steps you took to rectify the problem. Posting something like "my sound card doesn't work" isn't very helpful, and is likely either to be ignored by people who frequent the newsgroups or publicly flogged. Instead, include the operating system you are using, all the hardware that you can list, and the version of each software driver, especially the piece that you think is giving you the problem.
- Be nice, even if it's a bug in NetMeeting that's causing you a lot of trouble. If you are caustic toward Microsoft, or the people who help out in the newsgroup (the general term for such behavior is "flaming"), expect to be flamed back, or worse, ignored. A little politeness goes a long way online.
- Don't use ALL CAPITALS because most online users think you are shouting, plus it's very hard to read.
- Please read the FAQs (Frequently Asked Questions) and check all of the Web sites listed earlier before you post your question. If you do your homework first, you'll be respected online, and you'll probably solve the problem before you have to resort to the newsgroup anyway.
- Try to return the favor. If someone answers your question, spread the goodwill around. Answer someone else's question online.

Paid Technical Support

If you have tried all of these suggestions, and still can't get an answer to your question, then you'll need to resort to Microsoft's paid technical support. To get access to paid support, just visit http://support.microsoft.com/support/supportnet/. The price you pay depends on several factors, but most people will wind up spending around $35 for each issue that Microsoft works on.

PRODUCTS FOR EVERYDAY NETMEETING USERS

Most of the products listed in this section were gathered from the Microsoft NetMeeting Partner Pavilion at http://www.microsoft.com/netmeeting/partners/. This is not a comprehensive list. More products are announced every day, and

SAMSUNG EXHIBIT 1017, Page 337

they'll also be listed on the Partner Pavilion Web site. Where I have personal experience (I've tested dozens of video capture devices, for instance) I've listed my personal feedback.

Audio and Video Devices for NetMeeting

There are several products that enhance NetMeeting for nearly all users. First of all, there are sound cards, which I won't go into here because nearly every Windows sound card, like the Creative Labs popular AWE32 and AWE64 SoundBlaster types of cards, works with NetMeeting. NT users, however, have to be careful because only a few sound cards work with the full-duplex feature of NetMeeting. Creative Labs, for example, has a driver update on its Web site that works properly, but earlier drivers may not work.

For Windows 95, nearly all sound cards work okay, but you might want to check the newsgroups for prior experiences, just in case. In any event, I didn't have the resources to test every single sound card for NetMeeting compatibility, and even if I did, I wouldn't have space to list them all here. Check with the manufacturer for more information.

Now that NetMeeting supports videoconferencing features (version 1 did not), many companies are selling video devices that will work with NetMeeting. Here's a sampling of the desktop video products you'll find on the market (from press releases included in the Microsoft Partner Pavilion):

- **Connectix QuickCam VC.** This is an easy-to-install, low cost, parallel-port or USB (Universal Serial Bus) camera. It gives acceptable video quality, but a video capture card will give a better frame rate and a sharper picture, while using less processor power than this camera. Works with Windows 95 (NT 4 drivers not available at press time). Parallel-port cameras are popular because they are easier to install and they are the most inexpensive way of getting video into NetMeeting. Suggested retail: $139.

  `http://www.connectix.com`

- **Kodak DVC-300.** This is one of the first USB cameras. It provides a little better image than most parallel-port cameras.You must have a USB port, which most computers shipped prior to 1997 did not have. Like the Connectix QuickCam VC, this camera is easy to install but does not perform as well as a video capture card. Suggested retail: $199.

  `http://www.kodak.com`

- **Xirlink, Inc.** The Visionlink Video Phone is a camera similar to the Kodak USB model, but promises better performance. This camera was not available at press time. Suggested retail: $199.

  `http://www.xirlink.com`

SAMSUNG EXHIBIT 1017, Page 338

- **Brooktree-based video capture cards.** The Brooktree-based cards are capable video capture cards designed for the PCI bus. They all use the same basic design (based on the Brooktree chip and board design) and give good performance (30 frames per second at 320 x 240) at a fairly low price. Windows NT 4.0 support has been weak in the past (all three vendors were beta testing drivers at press time). All Brooktree boards require a separate sound card. They can handle only one video source at a time with NetMeeting.

  http://www.usr.com. (USRobotics Big Picture. List price: $199.)

  http://www.intel.com. (Intel Smart Video Recorder III. List price: $199.)

  http://www.hauppauge.com. (Hauppauge WinTV. List price: $129.)

- **Winnov-Videum AV and VO.** Both of these products are ISA video capture cards that can capture video from one of four different video sources: TV tuner, NTSC (camcorder), SVHS (high-end cameras) or from an integrated camera. Drivers for these two products support both Windows NT and Windows 95. The AV model has both full-duplex audio and video combined on one card (the only product on the market that has this feature), while the VO model is a video-only version.The Videum product is easy to install and I recommend it highly to those users who demand good quality audio and video conferencing. List price for Videum AV: $199. List price for Videum VO: $99.

  http://www.winnov.com

Different packages are available for all video capture cards (including some with cameras and bundled software), and street prices may vary. Check with the manufacturer for latest details.

Video for Notebook Users

If you are using a notebook computer and want video, you have fewer options. The Connectix is one, but again, parallel-port cameras don't give the kind of performance that most people want (even the NetMeeting README.TXT file says that users should avoid parallel-port cameras if they want the best performance). So, that leaves a few options:

- **Nogatech's ConferenceCard.** The ConferenceCard is a PC Card (formerly known as PCMCIA Type II) and an external dongle (box) that you can plug a video camera or camcorder into. It works only on Windows 95.

  http://www.nogatech.com

SAMSUNG EXHIBIT 1017, Page 339

- **Winnov's VideumCam Traveler.** The Traveler is a digital video camera that will work with either PC Card (PCMCIA Type II) or an ISA slot. It works on both Windows 95 and Windows NT 4.0, and gives the best video performance I've seen to date on portables. The Traveler has a full-duplex sound card built in, which works better than the audio built into most portable computers. Suggested retail price: $299.

  `http://www.winnov.com`

Optional Audio Devices

There are few items that will improve your NetMeeting experience as much as a good headset. Why? NetMeeting works best with a clean audio source and it will probably give an annoying echo if you use a common set of multimedia speakers and a microphone.

The echo problem is what caused me to look for a good set of headphones and I finally found them at Andrea Electronics. Andrea's headsets do something magic: they cancel out any echo and also any noises from the outside. Andrea's Active Noise Cancellation microphone technology improves speech intelligibility by electronically creating a signal that cancels background noise and echo speaker feedback. In a noisy environment (lots of other employees talking in neighboring cubicles), the Andrea headsets performed well and cancelled out every bit of background noise.

I can't emphasize how important this is to audio quality on NetMeeting. Background noise like computer fans, air-conditioning units, radios, cars, or other people talking near your system force NetMeeting to do additional work, and they also will take additional bandwidth to send over a phone line.

Anyway, if there's one purchase every NetMeeting user should make, it's a good headset (any headset will solve the echo problem that NetMeeting and other videophones have). The price is $59.

`http://www.andreaelectronics.com`

If you absolutely can't use a headset, Polycom might have an answer for you with its SoundPoint PC conference phone. SoundPoint PC is a full-duplex, hands-free audio conferencing system. It's basically a system that includes a speaker, a microphone, and a headset for private conversations. I used one and found it invaluable for group conferences, where several people were sitting around a table talking with a remote party. The price is $299.

`http://www.polycom.com`

SAMSUNG EXHIBIT 1017, Page 340

Other Videophones

NetMeeting isn't the only H.323 kid on the block: Intel's Internet Video Phone is also fully compatible with NetMeeting. The Intel Internet Video Phone has a simpler user interface than NetMeeting, but it doesn't offer application sharing or Whiteboarding like NetMeeting. It's a free product from http://www.intel.com and you might find the user interface to be more to your liking than NetMeeting.

If you are looking for better video quality, or if you want an easy-to-use videophone that lets you connect modem-to-modem, then the VDOnet VDOPhone might be for you. You might wonder why I'm mentioning this in a NetMeeting book, but the VDOPhone is interoperable with NetMeeting. VDOPhone uses its own video and audio compression technology, but it will "hook onto" NetMeeting and use NetMeeting's dataconferencing features (Chat, Whiteboard, and application sharing).

VDOnet's VDOPhone 3.0 adds H.323 compliance (it already was H.324 compliant) and many people believe that VDOPhone 3.0's video quality is superior to NetMeeting's. It's too hard for me to tell you conclusively that it's better, but it certainly deserves a look. Its improved quality comes with a price tag, though: at press time copies were running $79 each.

```
http://www.vdo.net
```

White Pine software has also announced that it is joining the H.323 fray. In fact, it has just delivered a Meeting Point server that will allow multiple NetMeeting users to hook up, talk, and see each other (sorry, this server came out as we were going to press, so I didn't get a chance to test it). White Pine, you might remember, was the first company to publicly sell Internet-based videoconferencing software (Enhanced CU-SeeMe). Enhanced CU-SeeMe 3.1 (expected to be out by the time this book is printed) will be H.323 compliant, which means a NetMeeting user should be able to call a CU-SeeMe use). CU-SeeMe versions were being sold at press time for $49.

```
http://www.wpine.com.
```

VCON has a version of its videoconferencing software that uses NetMeeting. VCON claims that its software gets faster frame rates and faster file transfer rates than NetMeeting alone if used on ISDN or high-speed LANs.

```
http://www.vcon.com
```

Get Phone Jacked!

Quicknet Technologies takes NetMeeting back to your real telephone with its Internet PhoneJACK product. The PhoneJACK is an enhanced sound card that lets you use NetMeeting with your regular telephone. It includes full-duplex audio support, echo cancellation in hardware, and support for a variety of audio sampling rates.

SAMSUNG EXHIBIT 1017, Page 341

With the PhoneJACK, you can set your regular telephone to ring when someone calls you on NetMeeting. You can dial users of NetMeeting with a regular touchtone phone. You can conference parties into a NetMeeting call using their local phone system, and you can bridge callers from a local phone into a NetMeeting call.

I found this $200 device exciting because it married the telephone to NetMeeting, which makes both more useful.

`http://www.quicknet.net`

CORPORATE NETMEETING PRODUCTS

There are a whole range of products that are aimed at corporate users and buyers, including special firewalls, high-priced but useful whiteboards, and gateways to allow your NetMeeting users to call a real telephone or an older H.320 videoconferencing system. This is a comprehensive roundup based on the NetMeeting Companion Products and Services Directory.

`http://www.microsoft.com/netmeeting/partners/`

Productivity Skyrockets with Conferencing Server

The CONFERease 100, from OutReach Technologies, is a Windows NT Server-based application that simplifies scheduling, participation, and application sharing and features integration of NetMeeting's application sharing component. The server builds a virtual conference session with meeting scheduling, invitations, and status checks of conference activity, all through a browser interface. Once users join a conference, the browser will automatically launch NetMeeting.

`http://www.outreachtech.com`

Host a Multipoint Conference on the Net

DataBeam's neT.120 Conference Server hosts multipoint conferences on the Internet. It uses a browser interface and a server to provide high-performance application sharing, whiteboarding, multipoint file transfer, and other collaborative applications. It gives NetMeeting users workgroup and enterprise resources that include:

- Multipoint bridging services
- Browser-based conference setup utilities
- Conference reservation and scheduling facilities

SAMSUNG EXHIBIT 1017, Page 342

- Increased scalability and network performance
- Reporting and management facilities

DataBeam developed the Whiteboard that was included with NetMeeting. This site is also a great source for information about data conferencing.

```
http://www.databeam.com
```

Whiteboards for Business

Teamboard, Inc., offers several conference room-style whiteboards that offer superior integration with NetMeeting. I had the opportunity to use this product and was very impressed with its capability. Their largest wall mount model is 5 feet by 4 feet, which is the normal size for a whiteboard in a corporate conference room. If you are serious about integrating NetMeeting capabilities in your corporation, I suggest that you examine this product.

```
http://www.teamboard.com
```

Make Your Whiteboard More Powerful

Drawing on the NetMeeting Whiteboard with a mouse can be frustrating. I've found using a stylus (an input device that looks like a pen) and a drawing tablet to be a far better way to go. I use the Wacom ArtPad II, which costs less than $200. The stylus is wireless and a joy to use. After a headset, this could be the most useful NetMeeting accessory.

```
http://www.wacom.com
```

A Better Whiteboard

MicroTouch Systems, Inc. produces Ibid, a personal electronic PC whiteboard that is interoperable with NetMeeting. Ibid has a 2-by-3 foot writing surface and instantly sends anything written on it to NetMeeting's Whiteboard.

```
http://www.microtouch.com
```

A Whiteboard Everyone Can See

SMART Technologies developed the SMART Board, a conference room-style whiteboard. Any meeting participant can walk up to the SMART Board, pick up a pen, write and erase his ideas just as he would on a regular whiteboard, and transmit those notes and drawings to all NetMeeting participants.

```
http://www.smarttech.com
```


SAMSUNG EXHIBIT 1017, Page 343

Share Unix with NetMeeting Users

Data Connection Limited's DC-Share for Unix lets Unix users share applications with Windows NetMeeting users through the T.120 standard.

`http://www.datcon.co.uk`

Offer Direct Dial to Your Users

eStream, from eFusion, Inc., enables PC-to-phone and phone-to-PC voice calls over the Internet.

`http://www.efusion.com`

Build a Customer Support Call Center

EveNTs Software Products, Inc. has built an Internet/intranet customer service system designed around NetMeeting 2.0 and later. Allow customers to click on a link on your Web page and connect to a real live customer support or sales person.

`http://www.eventssoftware.com`

Bridge Between H.320 and H.323 Videoconferencing

First Virtual Corporation developed a gateway that allows NetMeeting users to communicate with H.320 users (like PictureTel users).

`http.//www.fvc.com`

High-Performance Collaboration

NeTpower has announced TEAMview, which is designed to allow engineers and designers to collaborate on 3D models on Windows NT-based workstations. TEAMview extends NetMeeting by adding a lightweight user interface, a shared high-performance Whiteboard, optional secure transmission of all data, full 32-bit color application sharing, and sharing of any 2D or 3D application over a network with performance enhancements over standard NetMeeting and more.

`http://www.netpower.com`

Connect Your PBX to NetMeeting

Latitude Communications has added NetMeeting and T.120 data conference support to its MeetingPlace conference server, which connects to a company's PBX or the public switched telephone network and its LAN. It lets you use

SAMSUNG EXHIBIT 1017, Page 344

NetMeeting during multipoint conference calls by using your PBX-based telephone system for voice, and your LAN for T.120 data communications.

`http://www.latitude.com`

Call a Real Telephone from NetMeeting

The MICOM V/IP phone/fax IP gateway lets you use NetMeeting to make free intracompany calls to ordinary telephones and fax machines on the corporate intranet and make off-net calls anywhere in the world.

`http://www.micom.com`

Multi-User Video and Audio with NetMeeting

MultiLink's System 80 is a mixed-media multipoint control unit (MCU) that supports combinations of audio/video and audio/data on a multipoint conference call.

`http://www.multilink.com`

Multipoint Audio Conferencing

OnLive! Technologies, Inc. will deliver an audio conferencing server that allows companies to host large audio conferences using NetMeeting's H.323 standard audio.

`http://www.onlive.com`

Multipoint Video and Audio Conferences

VideoServer, Inc.'s Multimedia Conference Server technology enables multimedia, multipoint conferencing for electronic meetings across several remote sites, and will support H.323 and NetMeeting.

`http://www.videoserver.com`

NetMeeting-Supported Firewall

Trusted Information Systems introduced the Gauntlet Internet Firewall that supports NetMeeting and doesn't need a lot of configuration to work properly with NetMeeting.

`http://www.tis.com`

SAMSUNG EXHIBIT 1017, Page 345

H.320 to H.323 Gateway

RADVision's H.323/H.320 videoconferencing gateway, the L2W-323, enables NetMeeting users to communicate with H.320 devices like corporate-based meeting room conferencing systems.

`http://www.radvision.com`

Integrate Your PBX with NetMeeting

Lucent's MMCX server integrates your PC or Unix-based computers into your PBX phone system and adds call control, workgroup, and call coverage features to allow multipoint, multimedia conferencing via NetMeeting.

`http://www.lucent.com`

Use Voice, Video, and Data Networks

Incite has announced plans to deliver multimedia networking products that will include components required to integrate sophisticated data, voice, and video networks in a managed, client-server environment.

`http://www.incite.com`

FROM HERE...

In this chapter, I have discussed the online support available for NetMeeting that can help you through any problems you may encounter while using this product. I have also shown you some valuable companion products that you can use with NetMeeting to increase the productivity of your online sessions.

Take a look at these chapters for more information on troubleshooting and online information:

- Chapter 15, "Troubleshooting Audio," covers how to diagnose problems that can arise while using the audio functions of NetMeeting.
- Chapter 16, "Troubleshooting Video," examines the most common problems encountered while using the video features of NetMeeting and shows how to solve them.
- Appendix B, "Additional Online Information," lists a number of sites that have information relating to NetMeeting and data conferencing technologies.

SAMSUNG EXHIBIT 1017, Page 346

Chapter 19

Frequently Asked Questions

Throughout this book, I have done my best to detail every aspect of the operation of NetMeeting. But sometimes the easiest way to get information you want is to ask a question. This chapter has the most commonly asked questions relating to NetMeeting, as found in newsgroups and through my personal experience. If the question and answer does not solve your problem then you should look through the chapter that covers the topic of your question.

GENERAL QUESTIONS

Where Do I Get NetMeeting and Find Out About Updates?

NetMeeting is available from a variety of sources, but the best and safest way to get it is from Microsoft's Website at http://www.microsoft.com/netmeeting/ (there are several other NetMeeting resources linked from this page as well). You can also find it included with Microsoft's Internet Explorer Web browser at http://www.microsoft.com/ie/. Internet Explorer and NetMeeting are included on the companion CD-ROM for this book, too.

SAMSUNG EXHIBIT 1017, Page 348

Do I Need a Pentium Processor to Use NetMeeting?

No, but it is recommended, especially if you are planning to use video.

Do Processors with the MMX Instruction Set Really Help NetMeeting?

Yes they do—the audio and video codecs that NetMeeting uses are optimized for MMX processor instructions. There wasn't hard data available at press time, but on the author's test systems (two 200-MHz MMX systems), I saw between a 10 percent and a 100 percent increase in frame rate, along with better audio quality and less processor utilization.

Can I Use NetMeeting with Windows 3.1x?

No. NetMeeting requires a 32-bit operating system. In the near future, there will be videophones and collaborative software based on international communication and collaboration standards that will interoperate with NetMeeting on a variety of operating systems including UNIX and Macintosh (although I don't expect to see those developed for Windows 3.1x systems).

What Are the Best Places for More Information About NetMeeting?

There are several stops in our search for more information:

- The NetMeeting Web site at http://www.microsoft.com/netmeeting/
- The NetMeeting newsgroups at microsoft.public.internet.netmeeting and microsoft.public.inetexplorer.ie4.netmeeting, which are on the msnews.microsoft.com newsserver
- The NetMeeting Resource Kit at http://www.microsoft.com/netmeeting/reskit/

Can I Use NetMeeting to See and Talk with Numerous People at the Same Time?

Yes, but not with the NetMeeting client alone. You'll need to call into a service that is set up with an H.323-based server or a multipoint control unit that will support multiple users. One of the first demonstrations of this was with White Pine software's Meeting Point technology (formerly known as a CU-SeeMe Reflector).

SAMSUNG EXHIBIT 1017, Page 349

Can I Call a Real Telephone from NetMeeting?

Yes, you can, *but* you'll need to use an H.323 gateway to do that, and as of January 1998, there were no public gateways available. A gateway is simply a machine, hooked to the Internet, that you can call. It asks NetMeeting what telephone number you would like to call, and then it translates the NetMeeting audio into telephone-based audio and vice versa. It's expected that companies that open gateways for public use will charge a minimal fee for that use (at least it should be considerably less than the same long-distance call). More information will be made available on the NetMeeting Web site at http://www.microsoft.com/netmeeting.

Can I Call a Macintosh or UNIX User with NetMeeting?

Yes, through use of products that support the H.323 and T.120 standards, you will be able to use NetMeeting and interoperate with standards-based products on other platforms. Data Connection Limited (www.datcon.co.uk) is working on a NetMeeting-compatible product for UNIX, and NetOpia (www.netopia.com), formerly Farallon, is working on a NetMeeting-compatible product for Macintosh. For additional information, contact these respective companies.

Do I Need a Video Camera to Use NetMeeting?

No, you don't need a video camera or a video capture device to use NetMeeting and receive video another person sends to you. However, you do need a video camera or video capture device if you want to send video so people can see you during a NetMeeting call.

Do I Need a Sound Card to Use NetMeeting?

No, you do not need a sound card to use NetMeeting. However if you don't have one, you will not be able to use the audio capabilities to hear or talk to another person. Only the data conferencing work (application sharing, Whiteboard, Chat, and file transfer) and video features of NetMeeting will be available.

What Does H.323 Mean and Why Is It Important to NetMeeting Users?

H.323 simply means that NetMeeting is one of the first of a new breed of standards-based Internet videophones/collaborative tools. For most people, it just means they will be able to call people using other H.323-compliant devices from NetMeeting. (Intel's Video Phone is the first device that NetMeeting can call, but it's expected that by the middle of 1998 there will be dozens of other products that are H.323 compliant, thus NetMeeting compatible.)

SAMSUNG EXHIBIT 1017, Page 350

What's the Difference Between Using NetMeeting on Windows NT 4.0 Versus Windows 95?

There are two subtle differences. The first is the most important. Since Windows NT is a much better multitasking operating system, I've found that it is much more difficult to interrupt the audio or video on Windows NT 4.0 when performing other tasks on the computer than it is with Windows 95. The other difference is that on Windows NT, you'll need to load the Service Pack 3.0 or newer to use the application sharing features of NetMeeting.

I See There Are Some People with Adult-Oriented Comments on the NetMeeting ILS Directories—How Do I Keep This Information from My Children?

Here are some suggestions:

- Supervise what your children do while online. Realize that letting them use NetMeeting is akin to letting them talk with strangers.
- Consider prohibiting your children from using NetMeeting to call or receive calls from random people, allowing them to only accept calls from people they know. Perhaps even allow them only to call their friends (and put a list of their friends into NetMeeting's SpeedDial list).
- Have your children and their friends join an ILS that is watched regularly by parents or by you (setting up an ILS at work, for instance, isn't that difficult, and there are more than 100 ILS directories in the world, most of which are very quiet most of the time).

I've Been Getting Unwanted Calls from Other NetMeeting Users While Online—What Can I Do?

If you want to prevent people from being able to reach you through the ILS directory, you can hide your user information on the ILS server by selecting the "Do not list my name in the directory" option on the Calling tab from the NetMeeting Options dialog. If you do so, then the other person needs to know the ILS directory you are using, as well as the email address you are using. I also don't list in ILS directories except for my private ILSs, which greatly cuts down on the amount of frivolous NetMeeting calls I receive. (There's a list of more than 100 ILS servers at http://www.netmeet.net/ilslist.htm.)

SAMSUNG EXHIBIT 1017, Page 351

Can I Use NetMeeting with America Online?

NetMeeting works just fine with America Online, but you'll need to use the 32-bit version of America Online (in other words, version 3.0 or newer). NetMeeting requires the 32-bit version of Winsock and either Windows NT 4.0 and newer, or Windows 95 and newer. Check to see if you have AOL 3.0 or newer by opening the "Add/Remove Programs" control panel. America Online 3.0 or newer should be listed as one of the programs that is loaded on your system.

NetMeeting also works with the 32-bit versions of CompuServe, Prodigy, and Microsoft Network (MSN). Always make sure you have the latest version of your online service's software.

When I Start NetMeeting, It "Hangs" (Freezes)—How Can I Fix This?

You most likely have corrupted fonts (especially if you loaded Hewlett Packard's "Fonts for the Family"). Remove any nonstandard fonts and start NetMeeting again.

Also, try doing a "clean" install of NetMeeting. First, uninstall NetMeeting by using the "Add/Remove Programs" Control Panel device. Then delete the NetMeeting folder and restart the computer. Then update any video capture device drivers, any sound card drivers, or any modem drivers. Then reinstall NetMeeting (make sure you have the latest version).

Where Can I Go to Learn More About NetMeeting?

After reading this book, you should know all there is to know, right? Well, no, because NetMeeting is a changing product, and the information about NetMeeting changes every day, too. There are several places to regularly visit for more NetMeeting information. The first is Microsoft's NetMeeting Web site. This is where you should start your quest for NetMeeting information. Then, look at the NetMeeting newsgroups on Microsoft's news server at msnews.microsoft.com. The group names are:

- microsoft.public.internet.netmeeting
- microsoft.public.internet.netmeeting.beta
- microsoft.public.inetexplorer.ie4.netmeeting

SAMSUNG EXHIBIT 1017, Page 352

NETWORK QUESTIONS

How Do I Find My IP Address?

Finding your IP address is often useful so people can call you directly without looking for your listing in a directory listing. Every computer that is using TCP/IP protocol will have a different IP address when connected to a network (especially when connected to the Internet). Your IP address may change every time you log onto your network or Internet service provider.

For Windows 95, you can find your IP by running WINIPCFG.EXE, which is in your Windows directory. You can run this program simply by using the Start menu, choosing Run, typing "winipcfg," and hitting the Enter key or OK button.

For Windows NT 4.0 you'll need to run IPCONFIG from the command-line prompt.

Why Doesn't NetMeeting Work with My SLIRP Connection?

NetMeeting requires a PPP connection and won't work with SLIRP accounts or other emulated IP connections. A SLIRP account is a shell account connection to a UNIX server that can emulate an IP account, such as SLIP (Serial Line Internet Protocol) or PPP (Point-to-Point Protocol).

Does NetMeeting Work with Cable and Wireless Modems?

Yes. NetMeeting works with any connection device that uses TCP/IP protocol on Windows NT or Windows 95. I have used NetMeeting on cable modems, on cellular phones, and on radio modems. The higher the bandwidth (the amount of bits per second that a device sends and receives), the better the quality of the audio and video that you'll experience with NetMeeting.

Why Does My Internet Connection Work Well Sometimes, but the Audio Is Choppy and the Video Is Slow at Other Times?

First off, the Internet does not guarantee consistent or "good" bandwidth. The Internet's available bandwidth will fluctuate based on many factors. If the availability of bandwidth is consistently poor, then you might consider moving to another Internet Service Provider. The problems with Internet bandwidth are worse over long distances, especially if you are trying to connect with someone overseas or in a developing country. Often you can get a better connection

SAMSUNG EXHIBIT 1017, Page 353

simply by waiting a few minutes and calling back.

Choppy audio and poor video, however, can be caused by a number of different factors, especially if you have a slower computer (in other words, less than a Pentium 133 in speed). You should read through the troubleshooting chapters in this book for more information about factors that can degrade audio and video quality.

How Can I Use NetMeeting to Call People Outside My Company?

If your corporation has a firewall to isolate your network from the Internet, it may be configured to block the flow of packets from NetMeeting from leaving your corporate network. Check with your network administrator to see if you have a firewall, and if you do, you can ask him or her to open certain ports in the firewall that NetMeeting will need. See Chapter 11 for more information on firewalls.

Why Does NetMeeting Function So Well When I Use It on My Company's Network, but Not over the Internet?

You are probably noticing the bandwidth differences between the LAN (local area network) that you have at work and the Internet at large (or your corporate intranet), which has a lower amount of bandwidth.

You might also be facing some difficulties with your corporate firewall or proxy server (both of which are really an additional computer that "slows down" your NetMeeting data packets as they leave and enter your building). There's not much you can do about this slowdown except ask your network administrator for a direct line to the outside Internet or try to use a standard modem.

MAKING AND RECEIVING CALLS

How Come When I Call Someone I Get a Message That Says "The Person You Called Is Not Able to Accept a NetMeeting Call?"

There are several reasons this might happen:

- Your system is not set up properly (check your protocol settings both in NetMeeting and on your system, check your network or modem connection, check NetMeeting with another system that you know is working).
- You are behind a corporate firewall. To work properly, NetMeeting needs specific TCP/IP ports to be open. Try NetMeeting with another computer

SAMSUNG EXHIBIT 1017, Page 354

on your corporate network in your building and see if that works.

- The person you are trying to call has signed off or closed NetMeeting.
- The person you are trying to call has crashed his or her computer.
- You have entered an incorrect email address and NetMeeting is confused by it.

To properly use NetMeeting, you need to be using the same protocol as the other person, and you both must be properly connected. Some things to try: make sure the other person is still running NetMeeting and is willing to accept your call. Make sure that you are both using the same protocol (audio and video calls require TCP/IP protocol). Make sure that the person you are trying to call is not behind a corporate firewall that's not adapted for NetMeeting users (same for your machine). Try calling a computer on the same network you are on (a friend in the next cubicle or office, for instance). Can you PING the IP address of the person you are trying to call? (Open a DOS or command-line session and type "PING *xxx.xxx.xxx.xxx*," replacing the "*xxx*" with your partner's IP address.) If you are not receiving PING information back from your partner, then make sure your TCP/IP settings are correct (and have your potential partner do the same).

How Do I Change the ILS My Name Is Listed In?

There are more than 100 ILS directories to use around the world. Before I tell you how to change your directory listing, however, make sure you don't change it indiscriminately. If you do, anyone who added you to their SpeedDial list won't be able to call you after you move to a different directory. NetMeeting also uses the ILS servers for listing your name and finding other people. You can look for people on different directories without changing where your name is listed and that will let people find you in one spot.

However, if you are tired of the ILS that you are listed on and you'd like to be listed in another directory, simply use the Tools/Options menu selection and change the ILS. It's that simple.

How Do I Make My Name Invisible in an ILS but Allow People to Call Me?

Just use the Tools/Options menu selection and select the Calling tab. Then check the checkbox that says "Do not list my name..."

SAMSUNG EXHIBIT 1017, Page 355

How Do I Let People Click on a Link on My Web Page to Call Me Using NetMeeting?

You can add a link to your Web page for Internet Explorer users to click on to call you. There are several different calling methodologies you can use:

Format	*Example*
callto:DNS name	callto:machine2.test.com
callto:IP address	callto:208.203.3.120
callto:e-mail address	callto:user@somedomain.com
callto:server name/e-mail address	callto:ils2.microsoft.com/ user@somedomain.com

For example, if I, Bob Summers, wanted to embed a link in my Web page so other people can call me, I would add the following HTML tag to my Web page:

```
Call me using NetMeeting at
<A HREF="callto:ils2.microsoft.com/bob@nanocom.com">
ils2.microsoft.com/bob@nanocom.com</A>
```

See Chapter 11 in the Microsoft NetMeeting Resource Kit for more information about adding NetMeeting functionality to your Web pages and also see Chapter 13 in this book.

Why Do My Chat and Whiteboard Applications Sometimes Start Up When I'm in a Call?

Anyone who opens up a Chat or Whiteboard application will cause NetMeeting to open up that same application on all participants' computers. If you leave Chat or the Whiteboard open before you make the call, NetMeeting will automatically open these applications at the beginning of the connection with each participant.

Once you have opened Chat or the Whiteboard in a call, do not close it. Instead, just minimize the application, otherwise your partners won't be able to communicate with you in the Chat or Whiteboard applications, and their Chat and Whiteboard applications will say "0 users in call".

How Do I Call Someone Who Won't List Themselves in an ILS?

This one is tough, especially if the person you are trying to call has a dynamic IP address that changes every time he or she logs onto the Internet. There are at least four ways to attack this problem:

SAMSUNG EXHIBIT 1017, Page 356

- Call them on the telephone, get their IP address, and then call them in NetMeeting.
- Have them send you their IP address via email when they get online.
- Talk them into logging onto an ILS server as invisible, which would let you use the *ils2.microsoft.com/user@somedomain.com* syntax to call them.

My Friend's Computer Accepted My Call but He's Not There—Can I Leave Him a Message?

Yes, but it's not apparent at first that you can leave a message. However, there's a little trick. Open the Chat window and type a message for him or her. Then hang up. The Chat window on your friend's computer will not disappear until your friend closes NetMeeting and he or she will see your Chat window message upon returning to the computer.

How Can I Leave a Message for a Colleague Who Doesn't Have NetMeeting Running or Who Has Rejected My Call?

NetMeeting makes it easy for you to send an email message to the other person if they aren't available to accept your call. NetMeeting will display a message, and allow you to use your email program to send them a message.

How Can I Tell If My Friends Are Online and Ready to Accept NetMeeting Calls?

There are a couple of different ways. If you've added them to your SpeedDial list, NetMeeting will automatically check to see whether they are online every few minutes (you set the interval). If you are looking at an ILS directory listing, you'll see a little gray icon that shows they are online but not in a call. If they are in a call, the directory listing will show a little computer icon with a red star on it.

Why Does NetMeeting's Whiteboard and Chat Occasionally Say That There Are 0 Users Connected, Even Though I'm Definitely in a NetMeeting Session with Someone Else?

This happens because your partner closed down his Chat or Whiteboard application. Ask him or her to open it back up and all will be fine. If you have no way to tell your partner that they need to open up the Chat board or Whiteboard, you might be forced to call back.

SAMSUNG EXHIBIT 1017, Page 357

I Can't Connect with Anyone Listed on the ILS Server (It Says "Person Can't Accept NetMeeting Calls")—What Can I Do?

Something is probably wrong with your setup if you've called more than a dozen people and no one is answering your calls. Make sure you entered a real email address. Make sure you have only selected the TCP/IP protocol in the Tools/Options menu selection. Make sure you are not behind a firewall or proxy server. Make sure your Networking Control panel is set up properly and that you have configured your network and especially your TCP/IP protocol properly. If you've checked all of those things, try uninstalling NetMeeting, deleting the NetMeeting folder, restarting the machine, and then reinstalling the latest version of NetMeeting. Still stumped? Post a question on the NetMeeting newsgroup.

USING AUDIO AND VIDEO

Why Do I Hear My Voice a Second or Two After I Talk When My Partner Uses Full-Duplex Audio Mode?

There are two parts to this answer. The first is that there is some inherent delay in the processing of audio by NetMeeting, in the PC subsystem, and in the transfer of data over the Internet, resulting in a short delay in the audio sent each way over the network. Usually this delay is around half a second. You can see the length of the delay by opening the Intel Connection Advisor and switching to the Audio tab.

The second part to this answer is that if you are using full-duplex, your speakers are able to play audio at the same time your microphone records your voice, and this may result in an "echo" when you communicate with another person. NetMeeting has no way to discriminate between your voice and the voice of your partner, which goes out of your speakers and then straight back into your microphone.

There are a few ways you can attack this problem:

- Ask your partner to move his or her speakers away from the microphone.
- Ask your partner to adjust the sensitivity and level of his or her microphone.
- Ask your partner to buy a microphone that has anti-echoing software built in (I recommend the ones from Andrea Electronics, at http://www.andreaelectronics.com).

SAMSUNG EXHIBIT 1017, Page 358

- Ask your partner to buy a headset (especially one with built-in anti-echoing circuitry).
- Ask your partner to turn off full-duplex mode.

There are some other techniques you can try, especially if you are using a video capture device:

- If you are using a parallel-port or USB camera, consider upgrading to a video capture card. Video capture cards use less processor power, which lets NetMeeting process the audio faster.
- Use a smaller video size. Using large video sizes slows down NetMeeting's ability to process audio.
- Use lower quality or "faster" video. If both sides use the fastest setting available for receiving video, you'll notice a substantial decrease in audio delay.
- Get a computer with MMX instruction set enhancements. NetMeeting has been tuned for MMX instructions and the audio delay is often less on computers with MMX.

Why Is the Video Fuzzy and Small in NetMeeting?

Because the technical challenge of sending digital video over the Internet with a 28.8 modem is a big problem. You can attack the problem by all of the following:

- Compress the video (which means removing data that your eye can't easily perceive).
- Make it small (the smaller the video is, the less data needs to be sent).
- Reduce the frame rate (the lower the frame rate, the less data that needs to be sent).

To give you an idea of the technical challenge that NetMeeting's developers were up against, one second of 320 x 240 uncompressed video (not even TV quality) takes more than one megabyte of data. To send that over a 28.8 modem line would take several minutes. Sending video over a telephone line is the technical equivalent of taking all the water in Niagara Falls and putting it into a drinking straw.

Most people don't realize that they can make NetMeeting's video sharper simply by right-clicking on the Video window, choosing Properties, and then selecting "Better quality" video.

SAMSUNG EXHIBIT 1017, Page 359

Why Is My Friend's Video Better Than Mine?

Video quality is governed by a few factors:

- **Bandwidth.** The person with the most bandwidth will usually have the best video.
- **Processor speed.** Obviously the more the better, but I've found that the person with the best processor speed will send more frames to their partner than their partner can send back. Also, having an MMX instruction set on a Pentium helps too.
- **Having a better video capture device.** USB and parallel-port cameras are definitely slower than real video capture devices like the Winnov Videum AV.

Why Do I Need to Run the Audio Tuning Wizard, Even Though I Don't Have a Microphone and Don't Plan to Use NetMeeting's Audio Features?

NetMeeting requires you to set up your sound card before you can use the program. If you hit cancel, it will make you go through the Audio Tuning Wizard again.

SHARING AND OTHER FEATURES

When Sharing Applications, Do My Partners Need the Same Applications?

No. NetMeeting will share any application with your partner, even if your partner doesn't have the same fonts, the same application, or even the same operating system (a Windows NT user can now share with a Windows 95 user, for instance).

Can I Share My Video Games with My Friends?

Maybe. If the video game you are trying to share doesn't have a lot of action and doesn't use DirectX or AVI files, you'll probably be able to share it with some success. However, for most fast action video games, you'll either find that NetMeeting won't share the game outright or, if it tries, you'll get very poor performance.

How Do I Use Application Sharing with Windows NT 4.0?

You'll need to load the latest service pack (at press time it was NT Service Pack 3.0) on your system before you can use application sharing with NetMeeting

SAMSUNG EXHIBIT 1017, Page 360

on NT. If you don't have the NT Service Pack 3.0 loaded, you'll still be able to use NetMeeting, you just won't be able to utilize the application sharing features of NetMeeting.

FROM HERE...

Hopefully, you found the answer to your question about NetMeeting in this chapter. I have presented questions and answers for every aspect of NetMeeting.

If you are still having difficulty, I suggest you refer to the following:

- Chapter 15, "Troubleshooting Audio," which covers how to diagnose problems that can arise while using the audio functions of NetMeeting.
- Chapter 16, "Troubleshooting Video," which examines the most common problems encountered with the video features of NetMeeting and shows how to solve them.
- The Online FAQ that is part of the NetMeeting online technical support system, which is discussed in Chapter 18.

SAMSUNG EXHIBIT 1017, Page 361

Appendix A

Glossary

NetMeeting uses many technologies from different areas of computer science, communications, networking, and engineering. This makes it a powerful tool but it also creates a large vocabulary that may be confusing to new users. In addition, each NetMeeting feature has its own vocabulary (engineers love to use abbreviations as a code language that excludes the user).

This glossary gives you a simple definition for each term and should be useful to both the beginner and the advanced user. Included are some basic computing terms for users who might need them.

address mask A bit mask that is part of the local computer's configuration and is used to select bits from an IP address for subnet addressing. An address mask is 32 bits long, and selects the network portion of the IP address and one or more bits of the local portion.

application sharing Running an application on a local system and allowing remote users to see and control the application. Any application that can be executed can be shared.

ARPA (Advanced Research Projects Agency) The former name for DARPA, the government agency that funded the ARPANET and the Internet. *See also* ARPANET, DARPA.

ARPANET A pioneering long-haul network funded by ARPA (later called DARPA). ARPANET served from 1969 through 1990 as the basis for early networking research and for development of the Internet. ARPANET consisted of individual packet-switched nodes interconnected by leased lines. *See also* Internet.

asymmetric digital subscriber line (ADSL) A new technology used by local phone companies to give home users high-speed digital access to the Internet at a relatively low cost using normal telephone wires.

bandwidth A frequency measurement of the amount of information that can flow through a channel, expressed in cycles per second (hertz) or bits per second (bps). The higher the frequency, the higher the bandwidth.

baud A variable unit of data transmission speed, as in 1 bit per second (bps).

bit mask A set of bits that is applied to data for the purpose of selection. For example the bit mask "10000001" would select the first and last bits of a data word.

SAMSUNG EXHIBIT 1017, Page 362

bridge A computer or network component that connects two or more networks and sends packets among them. Bridges typically work at the physical network level. For example, an Ethernet bridge connects two physical Ethernet cables and sends packets from one cable to another. Unlike a repeater, a bridge stores and sends complete packets; a repeater sends electrical signals. *See also* repeater.

CCITT (Consultative Committee on International Telephony and Telegraphy) An international organization that sets standards for the interconnection of phone equipment.

chat One of the first methods of live communication between two or more computers. Chat allows text to be exchanged between two or more users and needs a very small amount of bandwidth.

checksum A small integer value computed from data being transferred, used for error detection and data recovery. The sending protocol typically calculates the checksum and puts it in the data stream. The receiving protocol checks the checksum and the data for errors.

client-server The model of interaction for a distributed system in which a program at one site sends a request to a program at another site and awaits a response. The requesting program is called a *client* and the program satisfying the request is called a *server*. A Web browser is an example of client software. NetMeeting is both a client and a server.

codec (compressor-decompressor) A mathematical computer algorithm used to compress and decompress digital data. The data can be video or audio. Codecs are an important part of any Internet telephony application such as NetMeeting.

commercial online service A company that offers computer online services, such as America Online, CompuServe, and Microsoft Network, and also serves as an Internet service provider (ISP).

compression The reduction of a file's size by means of a compression program. Compression can be *lossless* or *lossy*. Most video and audio compression is lossy. ZIP compression is lossless. *See also* lossless, lossy.

connection A path between two applications that provides reliable data transfer. A NetMeeting session can consist of one or more connections.

DARPA (Defense Advanced Research Projects Agency) Formerly called ARPA, the government agency that funded research and experimentation for ARPANET and later for the connected Internet.

data conferencing The interactive exchange of information between two or more computers.

data stream A collection of information that is sent or received. NetMeeting uses many data streams (audio and video for example) for communication.

datagram *See* IP datagram.

SAMSUNG EXHIBIT 1017, Page 363

decompression The inverse of compression. Data is decompressed to restore it to the original size. If the compression method is lossless, an exact copy of the original results. If the compression method is lossy, a degraded version may result. *See also* lossless, lossy.

desktop videoconferencing (DVC) Video conferencing on a personal computer.

digitize To convert an analog signal to a digital signal. Computers can only process digital signals, so analog signals are sampled and converted into numbers that the computer can understand.

directory server A central system that is responsible for tracking similar resources. NetMeeting uses the Internet Locator Service as a directory server to track users on the network. *See also* Internet Locator Service (ILS).

DNS (domain name system) The online distributed database system used to map human-readable machine names into IP addresses. DNS servers on the Internet use a name that allows sites freedom to assign machine names and addresses. For example, the host name www.microsoft.com is tranlated to 207.68.143.192.

dotted decimal notation The syntactic representation of a 32-bit integer consisting of four numbers that can range from 0 to 255. The numbers are written in base 10 with periods separating each number. Many TCP/IP applications accept dotted decimal notation for a host name. An example is 207.68.143.192, the dotted decimal notation for www.microsoft.com.

dynamic addressing A method used by an ISP to provide IP addresses to dial-in modems. Each time a connection is made with the ISP, a new address is assigned to the computer making the connection. This reduces the overall number of addresses needed to serve Internet users. *See also* static addressing.

Ethernet The most widely used local area network (LAN) technology. An Ethernet itself is a passive cable: the interconnections hold all the active components. Xerox Corporation, Digital Equipment Corporation (DEC), and Intel Corporation developed and published the standard for a 10-Mbps Ethernet.

firewall A security mechanism on a network that prevents unauthorized access to the network. The firewall analyzes network packets for packet type (protocol port), and source and destination addresses. A firewall can be configured to prevent a certain type of packet from accessing the network.

flow control Control of the rate at which hosts or gateways insert packets into a network or the Internet, usually to avoid congestion. Flow control is also used between modems to negotiate the rate for the data transfer.

fragment One of the pieces that results when an IP gateway divides an IP datagram into smaller pieces for transmission across a network that can't handle the original datagram size. Fragments use the same formats as the original datagram but are smaller. When received, the fragments are put back together to form the original datagram.

SAMSUNG EXHIBIT 1017, Page 364

frame rate The number of video images (frames) that are displayed in one second.

frames per second (fps) The number of still images displayed or captured per second. fps is a good measure of video quality. Full-motion video is 30 fps.

FTP (File Transfer Protocol) An Internet standard for the exchange of files.

full-duplex A connection that can send and receive at the same time. Your phone is an example of a full-duplex connection. *See also* half-duplex, simplex.

G.723.1 An ITU standard for audio compression and decompression that is part of the ITU H.323 videoconferencing standard. G.723.1 uses a 5.3-Kbps and a 6.3-Kbps codec for voice conversations on low-speed Internet connections.

gateway A special-purpose, dedicated computer that attaches to two or more networks or terminal adapters to route packets between them. An IP gateway routes IP datagrams from one IP network to another. An H.323 telephony gateway can connect a computer telephony application to the public phone network and enable you to use your computer to talk with someone on a phone. Gateways are sometimes used as translators between two existing protocols. An example is an H.320-to-H.323 video conferencing gateway.

H.263 An ITU standard for video compression and decompression that is part of the ITU H.323 video conferencing standard.

H.320 An ITU standard for video and audio conferencing using switched connections such as ISDN, T1, or switched 56. One or more 64-Kbps ISDN connections can be used together to transmit conferencing information.

H.323 An ITU standard for video and audio conferencing on packet-switched networks such as the Internet. NetMeeting is a H.323 standard compliant application.

half-duplex A connection that can either send or receive but can't send and receive at the same time. A one-lane bridge is an example of a half-duplex connection. *See also* full-duplex, simplex.

host Any computer that connects to a network. A host can be a personal computer or a supercomputer.

host name The network name assigned to a host computer. The host name is an easy way of accessing the host computer on the network.

HTTP (Hypertext Transfer Protocol) An internet standard for communications between Web servers and browsers.

Internet The collection of networks and gateways that use the TCP/IP protocol suite and function as a single, cooperative, virtual network. The Internet provides universal connectivity and three levels of network services: unreliable, connectionless packet delivery; reliable, full-duplex stream delivery; and application-level services like email that build on the first two services. The Internet reaches people all over the world for personal, educational, and business use.

SAMSUNG EXHIBIT 1017, Page 365

Internet address *See* IP address.

Internet Engineering Task Force (IETF) A group concerned with short-term and medium-term problems with TCP/IP and the connected Internet. The IETF is responsible for most ongoing research and standards relating to the Internet.

Internet Explorer (IE) The Microsoft Web browser that is free for any user of the Windows and Macintosh operating system. NetMeeting is part of the Internet Explorer platform.

Internet Locator Service (ILS) Formerly ULS, the standards-based directory server developed by Microsoft that runs on the Windows NT server platform. ILS is a central point on the network for Internet applications to register information such as name, location, IP address, and email address. This information is passed on to other applications so that connections can be made easily between similar applications. *See also* directory server.

Internet Protocol *See* IP (Internet Protocol).

interoperability The ability of software and hardware on multiple machines from multiple vendors to communicate. Standards are created and used to make interoperability possible.

IP (Internet Protocol) A protocol in which the IP datagram is the unit of information passed across a network. IP is the basis for a connectionless, unreliable, packet-delivery service.

IP address The 32-bit address assigned to hosts on a TCP/IP network. The IP address can be dynamically or statically assigned by the network administrator or network. Your computer sends and receives data from an IP address just as you send and receive mail from your home address. *See also* static addressing, dynamic addressing.

IP datagram The basic unit of information sent across a TCP/IP network. An IP datagram consists of a header and data. The header includes information about the datagram's sending and receiving IP address. This allows parts of the network, such as routers and bridges, to send the packet to its destination.

IPX/SPX A Novell network protocol with a different addressing scheme from IP networks. IPX/SPX is widely used by corporate networks.

Integrated Services Digital Network (ISDN) A digital network provided to customers by phone companies. ISDN sends data and voice services through the same medium. An ISDN connection consists of two 64-Kbps channels that can be used together to provide 128 Kbps. ISDN is the most widely available high-speed communication for homes and businesses.

International Telecommunications Union (ITU) An international organization of communications manufacturers and providers that sets standards to ensure the interoperability of communications equipment and services.

ISP (Internet service provider) A company that offers access to the Internet for residential and commercial use. If you access the Internet, you're using an ISP. Phone companies also offer Internet services.

SAMSUNG EXHIBIT 1017, Page 366

local area network (LAN) Any physical network that operates at high speed (10 Mbps or more) over short distances. A LAN connected to another remote LAN is part of a wide area network (WAN). *See also* (wide area network) WAN.

LDAP (Lightweight Directory Access Protocol) A protocol established by the IETF that allows standards-based directory servers and applications to query and exchange directory information. The Microsoft ILS supports the LDAP standard.

lossless Compression type that does not degrade the data. This type of compression is most commonly used by file compression utilities. ZIP compression is an example of lossless compression.

lossy Compression type that degrades the data being compressed. Video and audio compression are examples of lossy compression.

multipoint control unit (MCU) A device that links three or more point-to-point video conferencing systems into a multipoint conference.

name resolution The process of mapping a host address to an IP address. When you use a host name to specify a computer on the network, name resolution converts the host name to an IP address to make the connection. *See also* host name, IP address.

packet The unit of data that is sent on a network. On TCP/IP networks, a packet is an IP datagram. During a file transfer, a file is broken into packets and transmitted. (The Internet is a packet-switched network that routes packets from one place to another.) Splitting data into packets allows many applications to use the same communication channels without interfering with each other.

PING (Packet InterNet Groper) A program used with TCP/IP networks to test the connection between hosts. PING sends a simple *echo* message to the remote side and times how long it takes for the echo to return. If the echo is not returned, there may be a problem in the connection between the corresponding hosts.

pixel Fundamental unit of a computer display. You can think of a pixel as a dot. A pixel represents a color on the screen where the entire screen is a grid of *x* by *y* pixels. A typical display has 640 pixels across by 480 pixels down.

POTS (plain old telephone system) The public phone network. *Also called* public switched telephone network (PSTN).

protocol The formats and rules two or more machines use to exchange messages. A protocol can describe low-level details of how bytes are represented or high-level exchanges between applications. Protocols are the basis of communications standards on the Internet and between conferencing applications. When two programs or machines communicate with each other, a protocol enables them to understand each other.

protocol port A method used by transport protocols to allow multiple destinations on one given computer. TCP/IP protocols identify ports using small positive integers. Many standard ports are assigned for commonly used services

SAMSUNG EXHIBIT 1017, Page 367

such as email, FTP, and Web browsing. Every IP datagram must have a destination IP address and port number.

QoS (Quality of Service) The quality of the bandwidth provided by the network between two communications points. The Internet has no mechanism yet for guaranteeing QoS, though work on such a mechanism is under way.

repeater On a LAN, a hardware device used to extend the length of network cabling by amplifying and passing along the messages traveling through the network. *See also* bridge.

route The path that packets take in the network from source to destination computers. On TCP/IP networks, every datagram is routed separately. This means that during a large file transfer when the file is broken into many datagrams, the datagrams may travel different parts of the network to get from the source to the destination.

router Any computer that makes decisions about which of several paths network traffic will take. A piece of data goes through many routers to get from one location to another on the Internet. A utility called TraceRoute (TRACERT.EXE) allows you to see what route data is taking from your computer to another.

simplex A connection that sends data in only one direction. *See also* full-duplex, half-duplex.

socket An application interface used by software developers to access TCP/IP protocols. Just as a wall socket in your home or office gives your computer access to power, a socket on your computer gives an application access to the Internet (if you're connected). The WINSOCK.DLL is used on Windows computers by developers as a standard interface to the Internet.

static addressing A method of assigning an IP address that doesn't change to a computer. An Internet server has a static address. Corporate networks are usually set up with static addressing because every computer in the network must have a unique address and is always connected. *See also* dynamic addressing.

subnet address An extension of the IP addressing scheme that allows a site to use a single IP network address for multiple physical networks. You may see this configuration as subnet mask, which is generally set to 255.255.255.0.

T1 A digital phone service that offers 1.54 Mbps of bandwidth and is typically used for linking corporate networks or large video conferencing systems.

T.120 An ITU standard for data conferencing. T.120 is very broad and covers every aspect of NetMeeting, from Whiteboard to video conferencing. H.320 and H.323 are part of the T.120 standard.

TCP (Transmission Control Protocol) A transport-level protocol that provides reliable, full-duplex, stream services on which many applications depend.

TCP/IP Internet Protocol Suite The official name of the TCP/IP protocols.

SAMSUNG EXHIBIT 1017, Page 368

telephony The use of your personal computer and a computer network in telephone applications. Internet telephony has opened an entire industry of long distance providers that use the Internet to place inexpensive phone calls.

UART (universal asynchronous receiver and transmitter) An electronic device consisting of a single chip that can send or receive characters on asynchronous communications lines using RS-232. This chip talks to your modem and represents the serial port on your computer.

UDP (User Datagram Protocol) The TCP/IP protocol that allows an application program on one machine to send a datagram to an application program on another machine. UDP uses the IP to deliver datagrams. The difference between UDP and TCP is that UDP is not a reliable protocol (it doesn't make sure that the data is delivered to the destination).

ULS (User Location Service) The Microsoft directory server software for Windows NT that works with NetMeeting version 1.0. This has been superseded by the ILS.

videophone A communications device that can send and receive video and audio. First introduced by AT&T at the World's Fair in 1964, this device has been long awaited by the consumer market.

whiteboard A common area where participants can draw, collaborate, and share ideas. NetMeeting contains an electronic Whiteboard that can be marked on by participants from remote locations.

wide area network (WAN) Any network that spans a large geographic distance. A WAN typically operates at a lower speed than a LAN. *See also* (local area network) LAN.

ZIP A file-compression format widely used for compressing files on the Internet. A variety of tools allow you to create and use ZIP files. A file that has been compressed in this format has an extension of .ZIP.

SAMSUNG EXHIBIT 1017, Page 369

Appendix B

Additional Online Information

While there is a wealth of information about data conferencing on the Internet, few resources are available in book form and only a couple of magazines come close to covering this new area of computer technology. This will certainly change as the technology is adopted by a wider group of users and as it becomes part of our everyday lives. Compiled here is a listing of resources on the Internet that can help you in your search for answers and information relating to conferencing technologies and Microsoft NetMeeting. Most information about NetMeeting will be on the Microsoft site, as you might expect. It seems that every week the folks at Microsoft are adding more information about this new product.

RESOURCES ON THE INTERNET

The following Internet links on the Microsoft site point to where you can find NetMeeting information and other related resources:

- **General NetMeeting Information**

  `http://www.microsoft.com/netmeeting`

- **Software Development Kit**

  `http://www.microsoft.com/netmeeting/sdk`

- **Internet Locator Service**

  `http://www.microsoft.com/netmeeting/ils`

- **Resource Kit**

  `http://www.microsoft.com/netmeeting/reskit`

- **How-to Guide**

  `http://www.microsoft.com/IESupport/NetMeeting/content/howto/`

SAMSUNG EXHIBIT 1017, Page 370

- **Companion Products & Services**

  `http://www.microsoft.com/netmeeting/partners/`

Standards are a very important part of NetMeeting. The following links point to the organizations responsible for setting some of the standards that are used by NetMeeting. These sites contain detailed information about standards and interoperability:

- **International Telecommunications Union (ITU)**

  `http://www.itu.ch`

- **Internet Engineering Task Force (IETF)**

  `http://www.ietf.org`

- **International Multimedia Telecommuncications Consortium (IMTC)**

  `http://www.imtc.org`

If you are interested in learning more about Internet telephony, the following site is a good resource. It also has a listing of many of the conferencing products on the market today including NetMeeting:

- **Voice On the Net (VON)**

  `http://www.pulver.com`

For general information on video conferencing, the next link is a great resource. It even has a message forum area where you can read and post messages about video conferencing:

- **VideoConference.Com**

  `http://www.videoconference.com`

The first Internet video conferencing application was a program called CU-SeeMe (pronounced "See You See Me"). It is one of the most widely used conferencing programs, with both a Macintosh and Windows version. There are also good links to other conferencing information on this site:

- **CU-SeeMe**

  `http://www.cuseeme.com`

SAMSUNG EXHIBIT 1017, Page 371

USEFUL PROGRAMS AND UTILITIES

Throughout this book, I have made reference to several utilities and programs. Table B-1 lists these programs and tells you where you can get them. Many of the utilities in the table (the link is "Windows Network Installation") are part of the Windows installation and are automatically installed when you install dial-up networking and add the TCP/IP protocol. See Chapter 4, "Making Your First Call," for information on how to install dial-up networking.

Program Name	*Description*	*Link*
NetMeeting	Microsoft NetMeeting	http://www.microsoft.com/netmeeting
ILS	Internet Locator Service used for directory management	http://www.microsoft.com/netmeeting/ils
PING	Network utility used for verifying network stability	Windows Network Installation
TRACERT	Trace Route utility for tracking a network packet as it goes through your network	Windows Network Installation
NETSTAT	Monitors network connections on your computer	Windows Network Installation
WINIPCFG	Checks your current Internet connection and Address on Windows 95—on Windows NT, use IPCONFIG from a command prompt	Windows Network Installation

Table B-1. *NetMeeting Utilities.*

COMPANIES OF INTEREST

There are a number of companies that offer services and complete conferencing solutions. Table B-2 lists a few of them. Most of these sites also contain additional information about conferencing technologies, so they are worth a look even if you are not interested in the products or services they provide.

SAMSUNG EXHIBIT 1017, Page 372

Company Name	*Description*	*Address*
nanoCom	My company. Provider of Internet conferencing software, services, and consulting.	http://www.nanocom.com or email me: bob@nanocom.com
Databeam	Provider of T.120 standards software for NetMeeting.	http://www.databeam.com
PictureTel	Video conference system manufacturer and developer. They have systems from the low end to the high end.	http://www.picturetel.com
VTEL	Corporate conference system manufacturer and developer. Offering low-end and high-end conferencing systems.	http://www.vtel.com
Intel	Makers of H.323 software and Intel Video Phone that is compatible with NetMeeting	http://www.intel.com

Table B-2. *Company Links.*

VIDEO CAPTURE HARDWARE

Most computers do not come with any built-in video capture equipment. In fact, it is extremely rare, but this type of hardware is necessary to get full use of NetMeeting. In Chapter 7, "Video Conferencing," I discussed the details of using video with NetMeeting. Table B-3 lists the most commonly used video capture devices on the market. If you have hardware from one of these manufactures, you should check their Web site for updated device drivers because most of them release new ones about every six months.

SAMSUNG EXHIBIT 1017, Page 373

Company Name	*Product Name/ Information*	*Internet Address*
Cybration	ICUII Communicator. Complete video conferencing system with camera and hardware. All configurations are available. I recommend this package.	http://www.icuii.com
Winnov	Winnov Videum ISA/PCMCIA/PCI video and audio capture board and cameras. I highly recommended Winnov products.	http://www.winnov.com
Nogatech	Nogavision PCMCIA video and audio capture device.	http://www.nogatech.com
Connectix	QuickCam, Color QuickCam parallel-port cameras and Color QuickCam VC for PCs and Macintosh.	http://www.connectix.com
ACS	Compro DCAM color parallel-port camera for the PC.	http://www.acscompro.com

Table B-3. *Video Conference Equipment Manufacturers.*

ONLINE DOCUMENTATION

If you are still hungry for additional information about NetMeeting, there are some other resources available that are worth noting. Both NetMeeting and the ILS come with online help. However, the online help for NetMeeting is limited. You can turn to the index or table of contents in this book and find your topic of interest for a better understanding of the function that you need help with.

There are detailed technical documents that come with the ILS that may interest Web developers and network administrators. These are installed optionally with the ILS installation on your Windows NT Server.

SAMSUNG EXHIBIT 1017, Page 374

Index

A

Active Server Pages (ASP), 222
ActiveX control, 240
  initializing, 256
  control, NetMeeting, 243
  objects, 241
ActiveX, introduction, 240
addresses, IP static, 8
addresses, IP dynamic, 8
Adobe PageMaker, 9
America Online, 333
application sharing problems, *see* problems, application sharing
application sharing, 211, 214
  collaboration mode, 151
  experiments, email yourself, 161
  experiments, share Explorer Window, 162
  experiments, share a game, 159
  experiments, share Solitaire, 160
  explained, 150
  screen resolution, 155-6
  setting up, 152-5
  using phone line, 157-8
  view mode, 150
  Word document, 162
audio capture, 98-110
audio devices, 24-6
  Audio Tuning Wizard, 24
  optional, 321
  sound cards, 24
  sound recorder, 24-5
audio problems, *see* problems, audio
Audio Transmission and Reception
  latency, 101
  packet loss, 102
  propagation, 101
Audio Tuning Wizard, 42, 112, 270, 277-8, 341, 449
  changing settings, 49
audio
  alternatives, 178-9
  changing settings, 48
  compression, 100, 107-9
  compression, differential codec, 108
  compression, harmonic codec, 109
  compression, linear codec, 108
  compression, NetMeeting's codecs, 109-10
  decompression, 102-3
  features, 212
  fixing poor quality, 276
  multipoint conferencing, 326
  in Multipoint Meeting, 183-5
  multi-user, 326
  nonstandard Internet phones, 107
  playback, 103
  recording and testing, 41-2
  standards, 106
  standards, H.323, 106
  switching in multipoint meeting, 183
  transmission and reception, 101
Auto-gain, 112

B

bandwidth, 120-1
  bottleneck problems, 122
basics, Networking, 6
basics, Windows, 6
Brooktree-based video capture cards, 320

C

calls, receiving, 69
  Auto Accept, 70

SAMSUNG EXHIBIT 1017, Page 376

calls, receiving *(continued)*
Auto Start, 70
Do Not Disturb, 70
Callto, 178
cameras
multiple, 130-2
not responding, 285
parallel-port, 128-9
Quickcam, 129
serial-port, 128-9
video capture device, 128
CB-radio syndrome, 105
channels, circuit-switched, 122
channels, packet-switched, 122
Chat, 80-1, 226, 338
changing fonts, 83
Chatiquette, 84-5
connection, 81-2
customizing, 83
questions, 337
saving, 84
Chatiquette, 84-5
CO switch, 145
codecs, 101, 108-9
differential, 108
harmonic, 109
linear, 108
lossless, 140-3
lossy, 140-3
NetMeeting's, 109-10
their role, 139
collaboration, 158-60, 325
Escape key, 159
COM Object interface, 242
communications channel, 120
compression settings, advanced, 111
conference calls, enhancing, 213
Conference Manager object, 244-52
Conference Manager object events, *see* events
Conference Manager object methods, *see* methods
Conference Manager object properties, *see* properties
conferencing, 253-62
cleaning up code, 258
clearing information, 258
constants used by SDK, 261
handling buttons, 258
conferencing *(continued)*
handling manager events, 260
leave conference, 259
loading and testing, 261
uninitializing the control, 254
updating member list box, 257
conferencing example, 253-62
Conferencing Server, 323
connection of computer, 23-4
speed, 40
Timeout, 228
Internet, dynamic address, 57
Internet, with Internet Service Provider, 57
Internet, Microsoft Dial-Up Networking, 57
Internet, with Online Service, 58
Internet, directory server, 57
IP Network, 58
IP Network, LAN Connection, 59
IP Network, private network, 58
Connectix QuickCam VC, 319
Controls, NetMeeting ActiveX, 243
Corporate Network, using, 207
corporate networks, limitations, 200
CU-SeeMe, 9
Customer support call center, 325

D

Data Connection Limited, 331
degradation, general, 144
dialing and connecting problems, *see* problems, dialing and connecting
dialog box, New Call, 62-3
digital video, Sending, 121
Direct dial, 325
directory listing, 66-7
Domain Name Service, 60
downloading NetMeeting, 32-3
drivers, problems, 271

E

echo, avoiding, 278-9
encryption, 169
Ethernet, 125
events
Conference Manager object, ConferenceCreated, 247
Conference Manager object, DataReceived, 250

SAMSUNG EXHIBIT 1017, Page 377

events *(continued)*
Conference Manager object, DataSend, 249
Conference Manager object, FileReceived, 252
Conference Manager object, FileSent, 251
Conference Manager object, MemberChanged, 248
Conference Manager object, StateChanged, 248

F

features
application sharing, 211
audio, 212
file transfer, 211
Text Chat, 211
use of, 211-13
video, 212, 215
Whiteboard, 211
file transfer, 165-7, 211
applications, 168
compressing, 169
features, 211
virus free, 169
file transfer problems, *see* problems, file transfer
firewalls, 192-3, 200, 205-6
function, 201-2
NetMeeting-supported, 326
Four11, 316
fragmentation, disk, 19
frame rate, 121
full-duplex, 103-4
configuration options, 275-6
full-duplex problems, *see* problems, full-duplex

G

graphics, optimizing, 138

H

H.320 to H.323 Gateway, 327
H.323, 331
half-duplex, 103-4
Hardware Compatibility List (HCL), 283
headset, 105
HTML using VBScript, 254-6
Hughes Data Service, 125

I

ILS, 216
additional information, 237
administering, 234
comparison with ULS, 223
configuring, 227-33
free, 227
how to change, 336
installing corporate, 220-3
and LDAP, 223
server, 63
unauthorized users, 234-5
ILS, connecting and other problems, *see* problems, ILS connecting
Initialize method, 241
installation, 34-5
preparation, 33
removing old copies, 34
Intel Connection Advisor, troubleshooting, 52-3
Internet Locator Server (ILS), 14, *see also* ILS
Internet Locator Service *see* ILS
Internet protocols (IP), 7
IP address, 334
IP address, dynamic, 8
IP address, static, 8
ISDN, improving video, 144-5
ISDN, improving video, demodulation, 145
ISDN, improving video, modulation, 145
ISDN, tips on setting up, 146-7
ISDN, understanding, 145

J

Joint Photographic Experts Group (JPEG), 140

K

key, Escape, 159
Kodak DVC-300, 319

L

LAN connection, 59
finding someone, 60
events
finding someone, Domain Name Service, 60
with other LAN users, 61
logs, 205

SAMSUNG EXHIBIT 1017, Page 378

M

MCIS components, 226-7
  Address Book, 226
  Chat, 226
  Content Replication, 226
  Internet locator, 226
  MCIS Mail, 226
  MCIS News, 226
  Membership, 226
  Merchant, 226
  Personalization, 227
methods
  Conference Manager object, Advise, 245
  Conference Manager object, CreateConference, 245
  Conference Manager object, CreateUser, 246
  Conference Manager object, Initialize, 245
  Conference Manager object, Unadvise, 247
  Conference Manager object, Uninitialize, 245
microphone, adjusting, 112
Microsoft Commercial Internet System (MCIS), *see* MCIS
Microsoft Internet Explorer, 4, 20
Microsoft's Free Download Page, 20
MMX, 330
monitors, performance, 237
multipoint audio conferencing, 326
multipoint conferencing, 174
  centralized, 174-6
  decentralized, 174-6
  decentralized, limitations, 176-7
multipoint meeting, 177-83
  alternatives for audio, 178-9
  with audio and video, 183-5
  hosting, 180-1
  notifying users, 178
  notifying users, Callto, 178
  multipoint meeting
  notifying users, Outlook 98, 178
  notifying users, SpeedDial shortcut, 178
  planning, 177
  removing people, 181
  switching audio and video, 183
  video conferences, 326
MultipointConference Server, 323

N

NetMeeting
  2.1, 20
  ActiveX control, 243
  defined, xv
  downloading, 32-3
  incorporating, 210
  unique features, 11
NetMeeting, questions, *see* questions on NetMeeting
NetMeeting, setting up, *see* setting up NetMeeting
NetShow, 118
Netstat, 195-6
Networds, voice, video and data, 327
New Call dialog box, 62-3
NI-x standard, 146
Nogatech's ConferenceCard, 320

O

object, defined, 242
  interface COM, 242
  user, 252
objects
  ActiveX, 241
  conference, 242
  dynamic, 224
  MeetingPlace, 224
  user, 224
Objects, Conference Manager, 244, *see also* Conference Manager object
online support, 314-8
  Four11, 316
  knowledge base, 314
  Microsoft newsgroups, 317-8
  paid technical support, 318
  Resource Kit, 314
  Support, troubleshooter page, 314
OnLive, 179
Outlook 98, 178

P

packet stuffers, 190
packet types, 203-4
packets, 200
password authentication, 229
PBX, connected, 325

SAMSUNG EXHIBIT 1017, Page 379

PBX, integrated, 327
Pentium processor, 330
performance, improvements, 224
performance issues, 286-7
  poor quality in conference, 288-9
  slow video, 287
PhoneJACK, 322
PictureTel, 9
port number, 200, *see also* security
preparation, 16-22
  disk fragmentation, 19
  drivers, 21
  hard drive, 16-7
  recommended hardware, 16
  ScanDisk, 18
  Swap file, 18
  system updates, 19
  virus scanners, 18
problems, application sharing, 304-7
  outside access to files, 306-7
  programs inadvertently shared, 304
  shared window masked, 307
  sharing full-screen and graphics-intensive, 304-5
  slow performance, 305
problems, audio, 269-73
  changing volume, 271
  control to NetMeeting, 270
  hosting conference, 270
  more than two participants, 269
  solving, 269
  someone who can't use audio, 269
  sound cards and drivers, 271-3
  Tuning Wizard without microphone, 270
problems, common, 295-7
  access violation error, 296
  cannot modify SpeedDial, 297
  cannot open FrontPage, 297
  close program dialog box, 296
  conferencing application running, 295
  damaged fonts, 295
  no send to mail option, 297
  setup does not finish, 296
problems, dialing and connecting, 301-4
  caller cannot accept, 302
  not accept incoming calls, 301
  Windows dials, 303
problems, file transfer, 307
  unable to receive files, 307
problems, full-duplex, 273-4
  sound card capability, 274
  testing, 274-5
problems, ILS connecting, 298
  double-bound TCP/IP protocol, 299
  ILS unavailable, 299
  invalid IP address, 300
  recently closed, 300
  server down, 298
  Web directory not functional, 301
  whether 16-bit or 32-bit, 299
problems, video, 282-5
  black window, 285
  camera not responding, 285
  solving, 282
  video configuration options, 282-4
processor speed, leveraging, 109
products for users, 318-323
products, corporate, 323-7
property
  Conference Manager object, conference capabilities, 244
  Conference Manager object, conferences, 245
  Conference Manager object, remote conference, 244
protocols
  changing settings, 51
  problems ILS connecting, 299
  real-time protocol (RTP), 204
  transfer control protocol (TCP), 203
  user diagram protocol (UDP), 203
proxy server, 192-3, 202
  limitations, 206
  Web, 200

Q

questions on NetMeeting, 329-42
  audio, 339-41
  general, 329-33
  making and receiving calls, 335-9
  Network, 334-5
  sharing and other features, 341-2
Quickcam, 129

SAMSUNG EXHIBIT 1017, Page 380

R

real-time interactive communication, 210-1
Remote Access Service (RAS), 215
remote video, 135

S

safety, online, 193-4
safety, sharing applications, 196
scanners, virus, 18
script processor, 222
SDK, 240
security
  enhancements, 225
  making session secure, 190-2
  understanding, 190-1
setting up application sharing, 152-5
setting up NetMeeting,
  category of user type, adult, 39
  category of user type, business, 39
  category of user type, personal, 38
  directory server, 36
  entering personal information, 37
  entering personal information, hidden, 38
  entering personal information, move higher, 38
  entering personal information, SpeedDial, 38
  Installation Wizard, 35
settings
  changing, 44
  changing, general options, audio, 48
  changing, general options, protocols, 51
  changing, general options, video, 49-50
settings, general options, 44-6
  Audio Tuning Wizard, 49
  Calling, 47
  My Information, 46
sharing applications, in groups, 184
sharing applications, safety, 196
sharing, the Clipboard, 164
SLIRP connection, 334
Solitaire, 160
sound cards, 24
  problems, 271
sound recorder, 24-5
SoundBlaster, 96
sounds, customizing, 52
speaker volume, adjusting, 41
SpeedDial, 71
  delete entry, 74
  directory, 61
  managing list, 73-4
  problems, 297
  setting options, 72-3
  shortcuts, 47, 178
switch translations, 146

T

TCP/IP, 7
telecommuting, 215-6
teleconferencing, 8-14
  dataconferencing, 9-10
  groupware, 9-10
  limitations, 10-11
  tradeoffs, 10
teleconferencing, lingo, 12-3
  echoing, 12
  full-duplex audio, 12
  H-323, 13
  half-duplex mode, 12
telemedicine, 118-9
Telephone, 326
Telephony, 97-8
Text Chat, 211
tracking, 205
troubleshooter page, online support, 314
troubleshooting
  Intex Connection Advisor, 52-3
troubleshooting basics, 292
  checking common problems, 293
  identify problem, 292
  isolating problems, 293
  online, 294
troubleshooting, Whiteboard, 308-9
  cannot open file, 309
  pasting bitmap, 308
  text not visible, 308
  unpredictable colors, 308

U

ULS, 223
Unix, share, 325
updates, 329
updates, system, 19-21

SAMSUNG EXHIBIT 1017, Page 381

URL, 6
User authentication, anonymous, 225
User authentication, Windows NT, 225
User Object property, name, 252
User Object property, type, 253
utilities, monitoring, 194-5
utility, WINIPCFG, 8

V

VBScript, 254-6
video, 130-2, 212, 215
  capture device, 26-7
  capture device, VidCap, 32
  changing settings, 49-50
  color, 128
  controls under TollsOptions, 132-5
  data, redundancy, 143-4
  demodulation, 145
  features, 212, 215
  improving demodulation, 145
  improving with ISDN, 144-5
  improving modulation, 145
  modulation, 145
  multipoint conferencing, 326
  multipoint meeting, 183-5
  multi-user, 326
  problems, 282-6
  resolution, 127
  switching in multipoint meeting, 183
video conferencing
  basics, 116
  bridge between H.320 and H.323, 325
  desktop, 116-7
  for PR and crises, 119
  for universities, 119
  optimizing, 136-8
  optimizing, graphics, 138
  optimizing, preparation, 138-40
  as professional tool, 117
  standards, 126-8
  technology, 119-20
  telemedicine, 118-9
  transmission methods, 124-5
Videophones, 322
virus free file transfer, 169
viruses, avoiding, 196
volume Control Program, 42

W

Web proxy server, 200
Web without directory, 69
Whiteboard, 85-6, 211, 213, 338
  application screens, 91-3
  better, 324
  for business, 324
  everyone can see, 324
  graphic images, 90-1
  more powerful, 324
  questions, 337
  tools, 86-8
  troubleshooting, 308-9
Windows 95 Advanced Updates, 20
Windows 95 Update for Home Users Page, 20
Windows NT Updates, 21
Winnov's VadeumCam Traveler, 321
Winnov-Videum AV and VC, 320
Winsock, 58
WinZip, 21

X

Xirlink, Inc., 319

SAMSUNG EXHIBIT 1017, Page 382

BOB SUMMERS

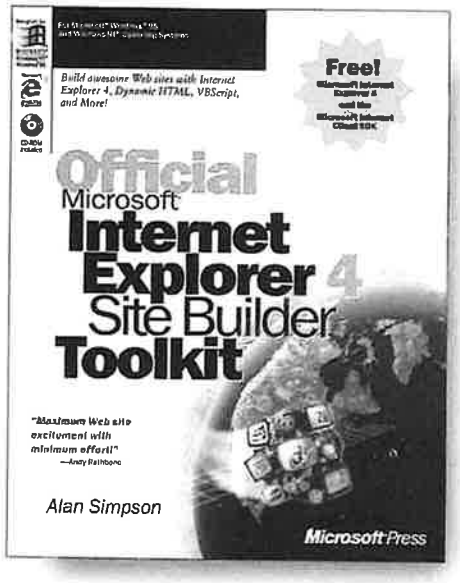
Bob is an expert in conferencing and communications software and is currently a consultant and student at Virginia Tech in Blacksburg, Virginia. Since the first time he touched a computer, he has been fascinated by their possible applications and has concentrated mostly in the area of communications software. He designed and developed several commercially available conferencing products. In February 1997, he took third place (Business category) in the Microsoft ActiveX challenge and his software has been highly acclaimed by television, print, and online media. Bob enjoys water and snow skiing, mountain biking, golf, and driving fast cars.



The manuscript for this book was prepared using Microsoft Word for Windows. Pages were composed by LightSpeed Publishing using Adobe PageMaker 6.5, with text in Garamond and display type in Helvetica Black. Composed pages were delivered to the printer as electronic prepress files.



Build awesome Web sites with Microsoft Internet Explorer 4!



U.S.A. **$39.99**
U.K. £37.49 [V.A.T. included]
Canada $53.99
ISBN 1-57231-572-5

OFFICIAL MICROSOFT® INTERNET EXPLORER 4 SITE BUILDER TOOLKIT, written by bestselling Internet author Alan Simpson, starts you off with a basic HTML review and an introduction to scripting, and then builds on those skills to show you how to manipulate objects in your Web pages. Alan gives you expert guidance by showing you multiple examples of how to add rich, interactive content to your Web pages. You'll find coverage of key topics such as:

- Dynamic HTML
- Cascading Style Sheets
- VBScript
- Special effects with filters and transitions
- ActiveX®
- Data binding
- Channels

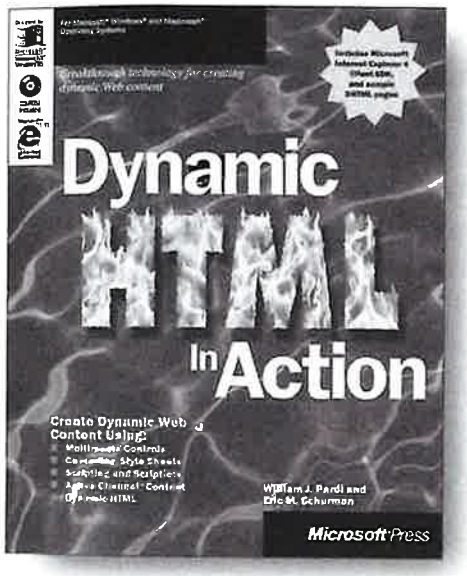
You'll also get Microsoft Internet Explorer 4 and the complete Microsoft Internet Client Software Development Kit (SDK) on CD-ROM, as well as numerous samples for creating Web pages. All of which makes this book your essential guide and reference for building your best Web sites ever.

Microsoft Press® products are available worldwide wherever quality computer books are sold. For more information, contact your book or computer retailer, software reseller, or local Microsoft Sales Office, or visit our Web site at mspress.microsoft.com. To locate your nearest source for Microsoft Press products, or to order directly, call 1-800-MSPRESS in the U.S. (in Canada, call 1-800-268-2222).

Prices and availability dates are subject to change.

Microsoft® Press

Create **vivid interactive Web content** with Microsoft **Internet Explorer 4!**



U.S.A. **$39.99**
U.K. £37.49 [V.A.T. included]
Canada $57.99
ISBN 1-57231-820-1

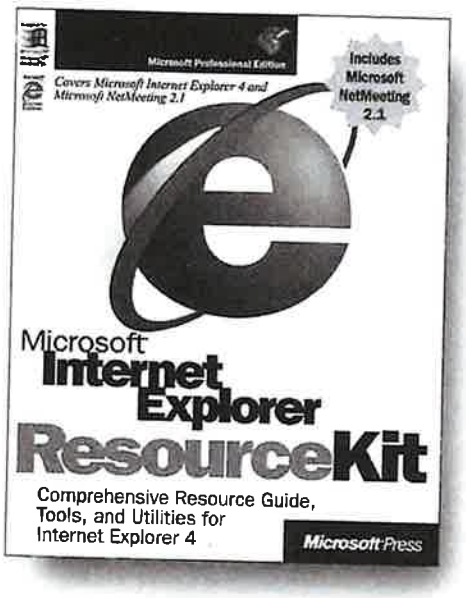
Here's the indispensable volume for site builders, Webmasters, multimedia authors, and anyone else who wants to discover all the technologies that make Microsoft® Internet Explorer 4 a major breakthrough. Inside is a rich exploration of Dynamic HTML, Cascading Style Sheets, the Internet Explorer 4 object model, scripting, multimedia effects and controls, and data binding. You'll discover Dynamic HTML as a multimedia authoring tool for Web, network, or CD-ROM–based productions. And you'll work with plenty of helpful examples on the enclosed CD-ROM. In short, if you want to do great things with Dynamic HTML, you want DYNAMIC HTML IN ACTION.

Microsoft Press® products are available worldwide wherever quality computer books are sold. For more information, contact your book or computer retailer, software reseller, or local Microsoft Sales Office, or visit our Web site at mspress.microsoft.com. To locate your nearest source for Microsoft Press products, or to order directly, call 1-800-MSPRESS in the U.S. (in Canada, call 1-800-268-2222).

Prices and availability dates are subject to change.

Microsoft® Press

The professional's companion to Microsoft Internet Explorer 4.



U.S.A. **$49.99**
U.K. £46.99 [V.A.T. included]
Canada $71.99
ISBN 1-57231-842-2

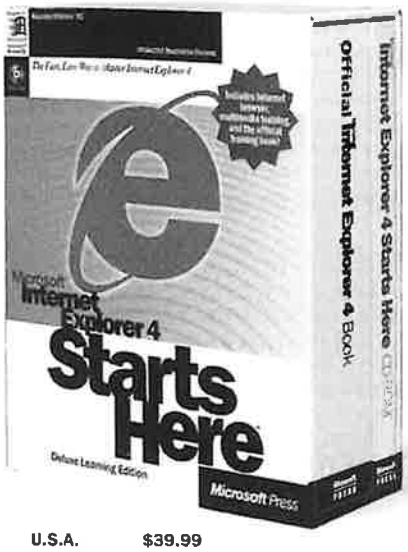
This exclusive Microsoft® collection provides complete technical information on Microsoft Internet Explorer version 4.0 for the network administrator, the support professional, and the internet service provider. The MICROSOFT INTERNET EXPLORER RESOURCE KIT gives you a technical resource guide packed with authoritative information and an indispensable CD-ROM containing Microsoft Internet Explorer 4, the Microsoft Internet Explorer Administration Kit, valuable utilities, accessory programs, and source code that help you save time and accomplish more—all of which makes it easier for you to deploy and support customized versions of Internet Explorer in your organization.

Microsoft Press® products are available worldwide wherever quality computer books are sold. For more information, contact your book or computer retailer, software reseller, or local Microsoft Sales Office, or visit our Web site at mspress.microsoft.com. To locate your nearest source for Microsoft Press products, or to order directly, call 1-800-MSPRESS in the U.S. (in Canada, call 1-800-268-2222).

Prices and availability dates are subject to change.

Microsoft® Press

Master Internet Explorer 4!



U.S.A. **$39.99**
Canada $57.99
ISBN 1-57231-882-1

Along with the Microsoft® Internet Explorer 4 product, complete with add-ons, MICROSOFT INTERNET EXPLORER 4 STARTS HERE™, DELUXE LEARNING EDITION, includes the *Official Microsoft Internet Explorer 4 Book* and the *Microsoft Internet Explorer 4 Starts Here* CD-ROM from Microsoft Press. The result is a combination that not only enables you to upgrade effortlessly to Internet Explorer 4, it also provides quick and easy ways to learn how to use it.

Microsoft Press® products are available worldwide wherever quality computer books are sold. For more information, contact your book or computer retailer, software reseller, or local Microsoft Sales Office, or visit our Web site at mspress.microsoft.com. To locate your nearest source for Microsoft Press products, or to order directly, call 1-800-MSPRESS in the U.S. (in Canada, call 1-800-268-2222).

Prices and availability dates are subject to change.

Microsoft® Press

IMPORTANT—READ CAREFULLY BEFORE OPENING SOFTWARE PACKET(S). By opening the sealed packet(s) containing the software, you indicate your acceptance of the following Microsoft License Agreement.

MICROSOFT LICENSE AGREEMENT

(Book Companion CD)

This is a legal agreement between you (either an individual or an entity) and Microsoft Corporation. By opening the sealed software packet(s) you are agreeing to be bound by the terms of this agreement. If you do not agree to the terms of this agreement, promptly return the unopened software packet(s) and any accompanying written materials to the place you obtained them for a full refund.

MICROSOFT SOFTWARE LICENSE

1. GRANT OF LICENSE. Microsoft grants to you the right to use one copy of the Microsoft software program included with this book (the "SOFTWARE") on a single terminal connected to a single computer. The SOFTWARE is in "use" on a computer when it is loaded into the temporary memory (i.e., RAM) or installed into the permanent memory (e.g., hard disk, CD-ROM, or other storage device) of that computer. You may not network the SOFTWARE or otherwise use it on more than one computer or computer terminal at the same time.

2. COPYRIGHT. The SOFTWARE is owned by Microsoft or its suppliers and is protected by United States copyright laws and international treaty provisions. Therefore, you must treat the SOFTWARE like any other copyrighted material (e.g., a book or musical recording) except that you may either (a) make one copy of the SOFTWARE solely for backup or archival purposes, or (b) transfer the SOFTWARE to a single hard disk provided you keep the original solely for backup or archival purposes. You may not copy the written materials accompanying the SOFTWARE.

3. OTHER RESTRICTIONS. You may not rent or lease the SOFTWARE, but you may transfer the SOFTWARE and accompanying written materials on a permanent basis provided you retain no copies and the recipient agrees to the terms of this Agreement. You may not reverse engineer, decompile, or disassemble the SOFTWARE. If the SOFTWARE is an update or has been updated, any transfer must include the most recent update and all prior versions.

4. DUAL MEDIA SOFTWARE. If the SOFTWARE package contains more than one kind of disk (3.5", 5.25", and CD-ROM), then you may use only the disks appropriate for your single-user computer. You may not use the other disks on another computer or loan, rent, lease, or transfer them to another user except as part of the permanent transfer (as provided above) of all SOFTWARE and written materials.

5. SAMPLE CODE. If the SOFTWARE includes Sample Code, then Microsoft grants you a royalty-free right to reproduce and distribute the sample code of the SOFTWARE provided that you: (a) distribute the sample code only in conjunction with and as a part of your software product; (b) do not use Microsoft's or its authors' names, logos, or trademarks to market your software product; (c) include the copyright notice that appears on the SOFTWARE on your product label and as a part of the sign-on message for your software product; and (d) agree to indemnify, hold harmless, and defend Microsoft and its authors from and against any claims or lawsuits, including attorneys' fees, that arise or result from the use or distribution of your software product.

DISCLAIMER OF WARRANTY

THE SOFTWARE (INCLUDING INSTRUCTIONS FOR ITS USE) IS PROVIDED "AS IS" WITHOUT WARRANTY OF ANY KIND. MICROSOFT FURTHER DISCLAIMS ALL IMPLIED WARRANTIES INCLUDING WITHOUT LIMITATION ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE. THE ENTIRE RISK ARISING OUT OF THE USE OR PERFORMANCE OF THE SOFTWARE AND DOCUMENTATION REMAINS WITH YOU.

IN NO EVENT SHALL MICROSOFT, ITS AUTHORS, OR ANYONE ELSE INVOLVED IN THE CREATION, PRODUCTION, OR DELIVERY OF THE SOFTWARE BE LIABLE FOR ANY DAMAGES WHATSOEVER (INCLUDING, WITHOUT LIMITATION, DAMAGES FOR LOSS OF BUSINESS PROFITS, BUSINESS INTERRUPTION, LOSS OF BUSINESS INFORMATION, OR OTHER PECUNIARY LOSS) ARISING OUT OF THE USE OF OR INABILITY TO USE THE SOFTWARE OR DOCUMENTATION, EVEN IF MICROSOFT HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. BECAUSE SOME STATES/COUNTRIES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF LIABILITY FOR CONSEQUENTIAL OR INCIDENTAL DAMAGES, THE ABOVE LIMITATION MAY NOT APPLY TO YOU.

U.S. GOVERNMENT RESTRICTED RIGHTS

The SOFTWARE and documentation are provided with RESTRICTED RIGHTS. Use, duplication, or disclosure by the Government is subject to restrictions as set forth in subparagraph (c)(1)(ii) of The Rights in Technical Data and Computer Software clause at DFARS 252.227-7013 or subparagraphs (c)(1) and (2) of the Commercial Computer Software — Restricted Rights 48 CFR 52.227-19, as applicable. Manufacturer is Microsoft Corporation, One Microsoft Way, Redmond, WA 98052-6399.

If you acquired this product in the United States, this Agreement is governed by the laws of the State of Washington.

Should you have any questions concerning this Agreement, or if you desire to contact Microsoft Press for any reason, please write: Microsoft Press, One Microsoft Way, Redmond, WA 98052-6399.

Register Today!

Return this
Official Microsoft® NetMeeting™ Book
registration card for
a Microsoft Press® catalog

U.S. and Canada addresses only. Fill in information below and mail postage-free. Please mail only the bottom half of this page.

1-57231-816-3 ***OFFICIAL MICROSOFT® NETMEETING™ BOOK*** ***Owner Registration Card***

NAME

INSTITUTION OR COMPANY NAME

ADDRESS

CITY STATE ZIP

Microsoft® Press
Quality Computer Books

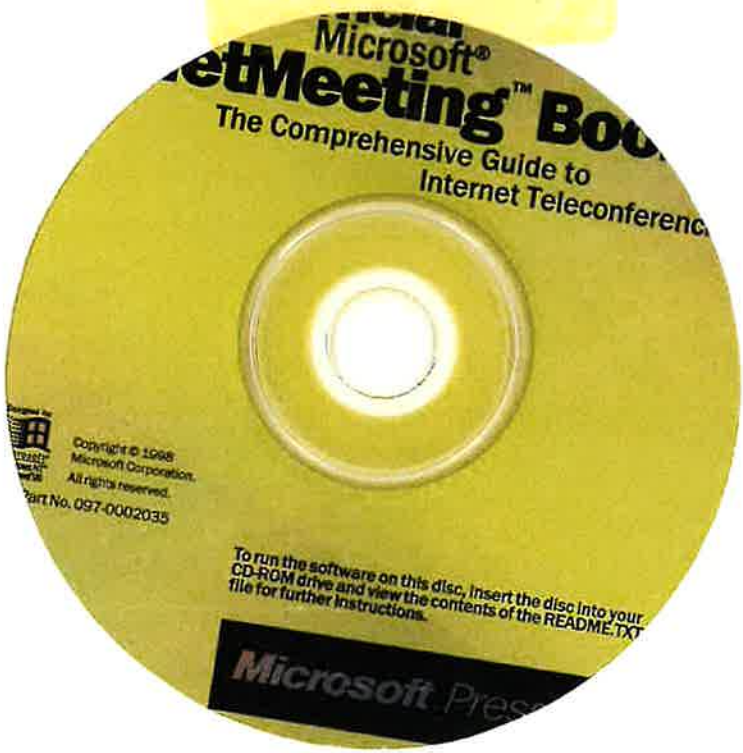
For a free catalog of
Microsoft Press® products, call
1-800-MSPRESS

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST-CLASS MAIL PERMIT NO. 53 BOTHELL, WA

POSTAGE WILL BE PAID BY ADDRESSEE

MICROSOFT PRESS REGISTRATION
OFFICIAL MICROSOFT® NETMEETING™
BOOK
PO BOX 3019
BOTHELL WA 98041-9946


Microsoft®
The Comprehensive Guide to
Internet Teleconferenc
Copyright © 1998
Microsoft Corporation.
All rights reserved.
Part No. 097-0002035
To run the software on this disc, insert the disc into your
CD-ROM drive and view the contents of the README.TXT
file for further instructions.
Microsoft Press

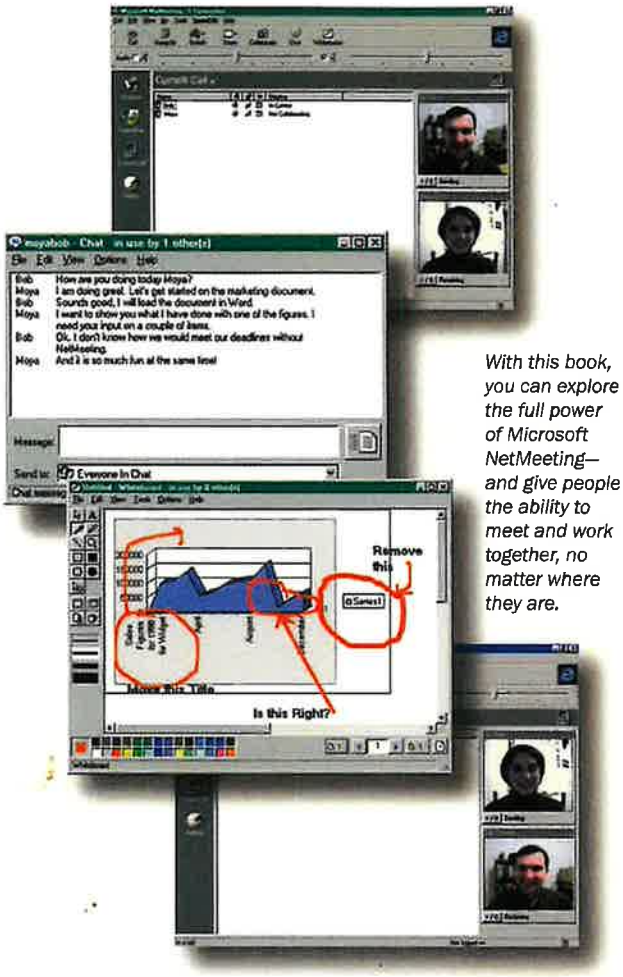
"Bob has done a great job showing how to empower corporate networks with Internet conferencing!"
—John Yochim, Systems Developer, First Union National Bank

Unleash the power to communicate on the Internet!

Microsoft® NetMeeting™ conferencing software lets you meet and work face to face with colleagues and friends, no matter how far apart you are, via the Internet or your corporate intranet. And this guide—the first of its kind—helps you understand and learn how to use this remarkable software. Here you'll find clear, detailed descriptions of video conferencing, application sharing, and every other component of NetMeeting—which makes this a great book for corporate network managers as well. The OFFICIAL MICROSOFT NETMEETING BOOK will show you how to use NetMeeting to:

- See and talk with family, friends, and colleagues via the Internet
- Collaborate electronically with clients and businesses
- Create a virtual community where everyone can interact
- Develop your own conferencing applications
- Use the Whiteboard and Chat features in NetMeeting
- Share applications, host a group conference, handle security, troubleshoot, and use additional resources

Talk face to face with friends, collaborate in real time with coworkers, create advanced Help Desk services, build unmatched training and distance learning systems, and far more—the key is Microsoft NetMeeting. And the key to NetMeeting is the OFFICIAL MICROSOFT NETMEETING BOOK.



With this book, you can explore the full power of Microsoft NetMeeting—and give people the ability to meet and work together, no matter where they are.

Inside on CD-ROM!
- **Complete Microsoft NetMeeting 2.1 client**
- **Microsoft Internet Explorer 4**
- **Searchable book text**
- **Internet Locator Service (ILS) server software**

ISBN 1-57231-816-3

U.S.A. **$34.99**
U.K. £32.99 [V.A.T. included]
Canada $50.99
[Recommended]

mspress.microsoft.com

Internet/Microsoft NetMeeting/ Microsoft Internet Explorer

Microsoft Press