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Sinha et al.

(54) SYSTEMS AND METHODS FOR RESPONDING TO THE OCCURRENCE OF AN EVENT

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(21) Appl. No.: **11/875,883**

(22) Filed: **Oct. 20, 2007**

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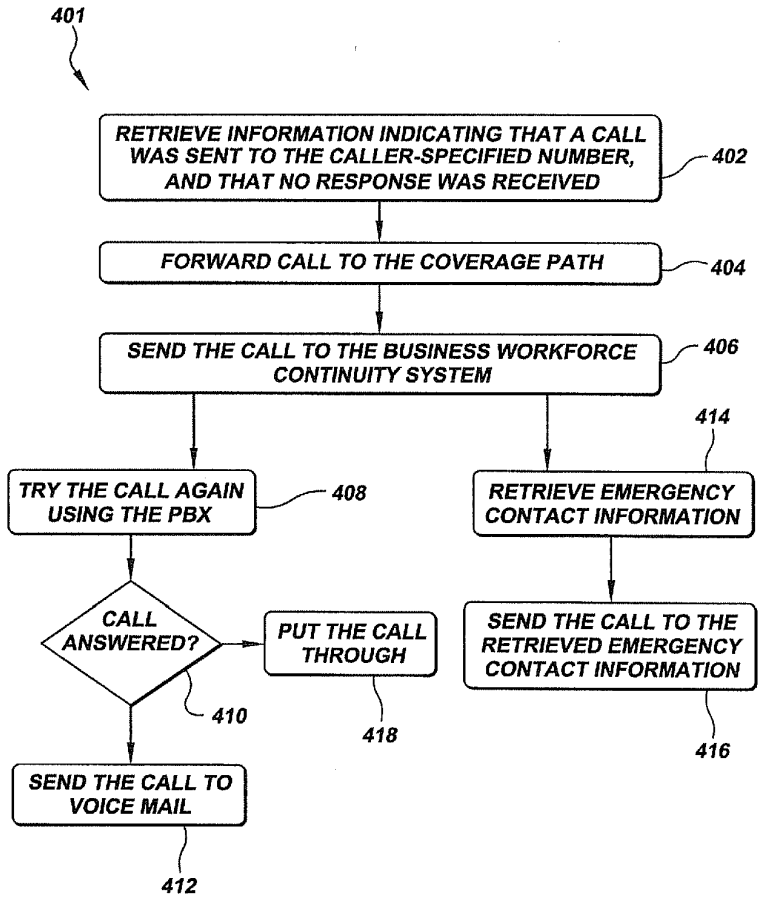
Publication Classification

(51) **Int. Cl.**
G06Q 99/00 (2006.01)

(52) **U.S. Cl.** **705/1**

(57) **ABSTRACT**

The system and method provide a business continuity application to a portion of a displaced workforce of an organization when an event occurs. The business continuity application, executing on a server within a data center, is used to define a response scenario to the occurrence of an event. The business continuity application allows for notifications to be sent to the workforce using a notification service that interfaces with the server, and further provides remote-access to computing resources via a remote access server that interfaces with the server. A communication gateway installed between the server and a private branch exchange further provides a portion of the business continuity application. Displays of portions of the business continuity application after the occurrence of an event are sent to end-users that can access the computing device. The computing device is further in communication with a portable memory device.



Meta EX1007
Meta v. SitNet
IPR2026-00100

FIG. 1A

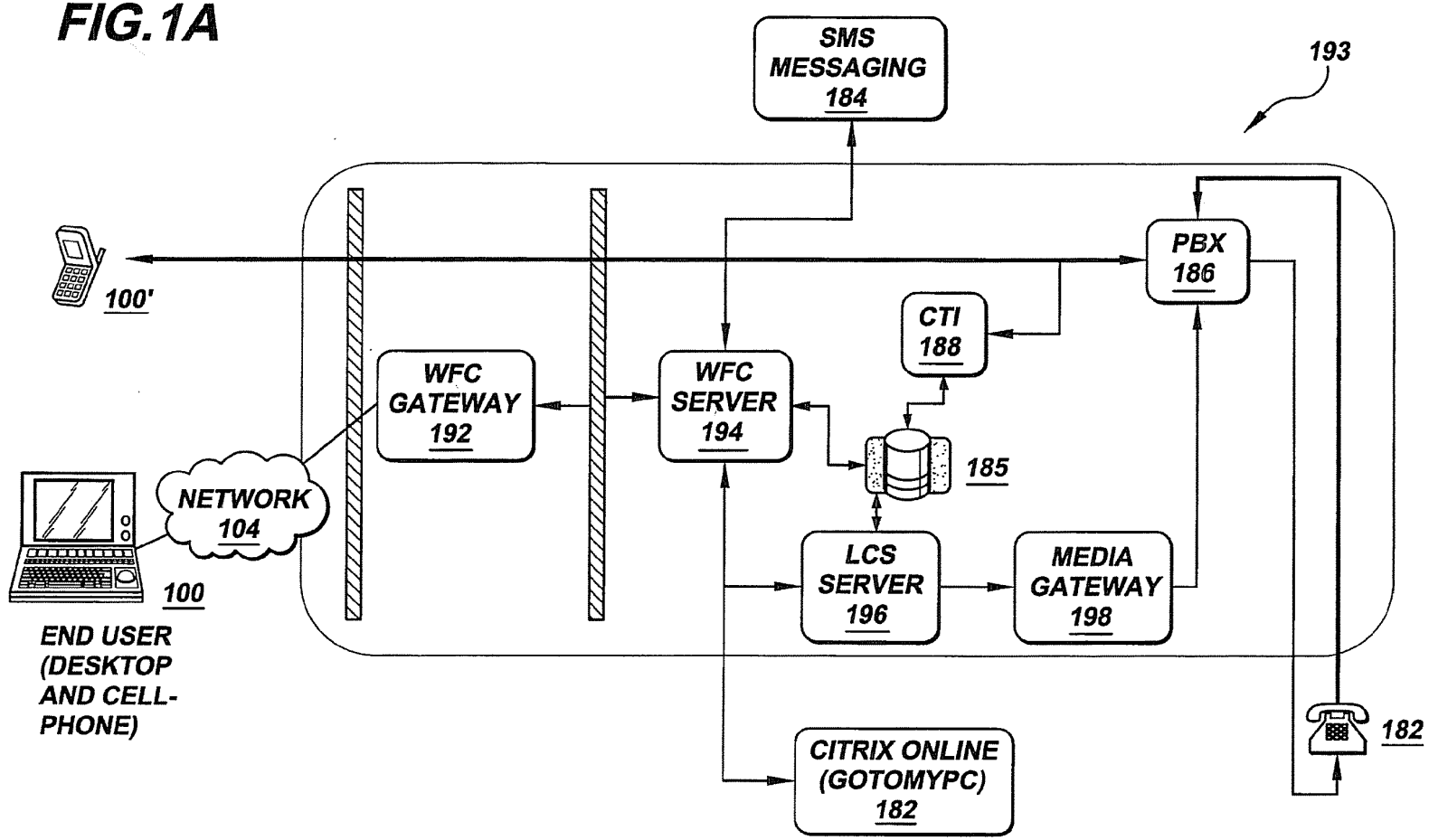

SMS MESSAGING 184
193
PBX 186
100'
CTI 188
WFC GATEWAY 192
WFC SERVER 194
185
NETWORK 104
LCS SERVER 196
MEDIA GATEWAY 198
100
END USER (DESKTOP AND CELL-PHONE)
182
CITRIX ONLINE (GOTOMYPC) 182

FIG.1B

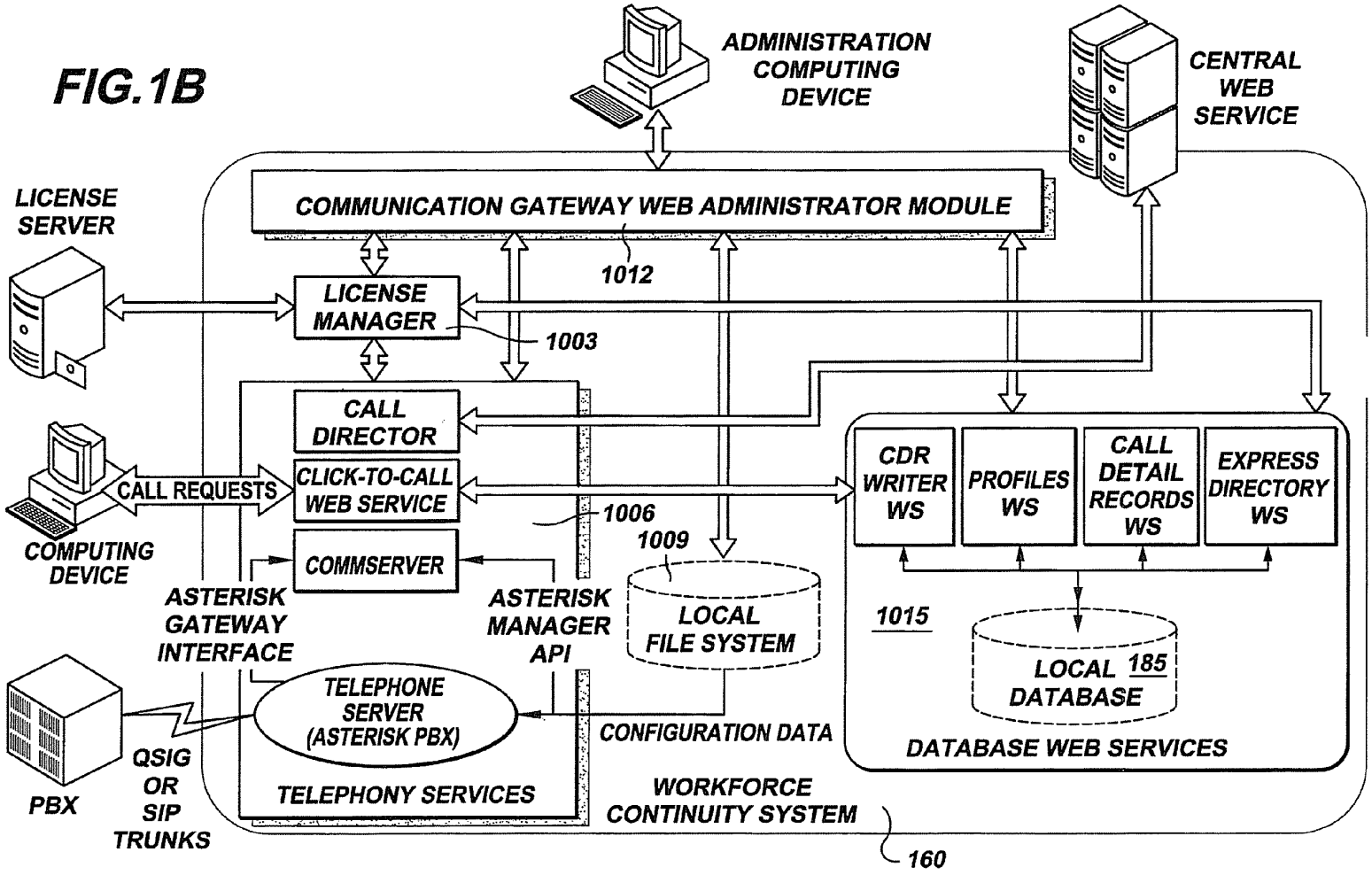

ADMINISTRATION COMPUTING DEVICE
CENTRAL WEB SERVICE
LICENSE SERVER
COMMUNICATION GATEWAY WEB ADMINISTRATOR MODULE
1012
LICENSE MANAGER
1003
CALL DIRECTOR
CALL REQUESTS
CLICK-TO-CALL WEB SERVICE
1006
COMPUTING DEVICE
COMMSERVER
1009
ASTERISK GATEWAY INTERFACE
ASTERISK MANAGER API
LOCAL FILE SYSTEM
CDR WRITER WS
PROFILES WS
CALL DETAIL RECORDS WS
EXPRESS DIRECTORY WS
1015
LOCAL DATABASE
185
DATABASE WEB SERVICES
TELEPHONE SERVER (ASTERISK PBX)
CONFIGURATION DATA
PBX
QSIG OR SIP TRUNKS
TELEPHONY SERVICES
WORKFORCE CONTINUITY SYSTEM
160

FIG.1C

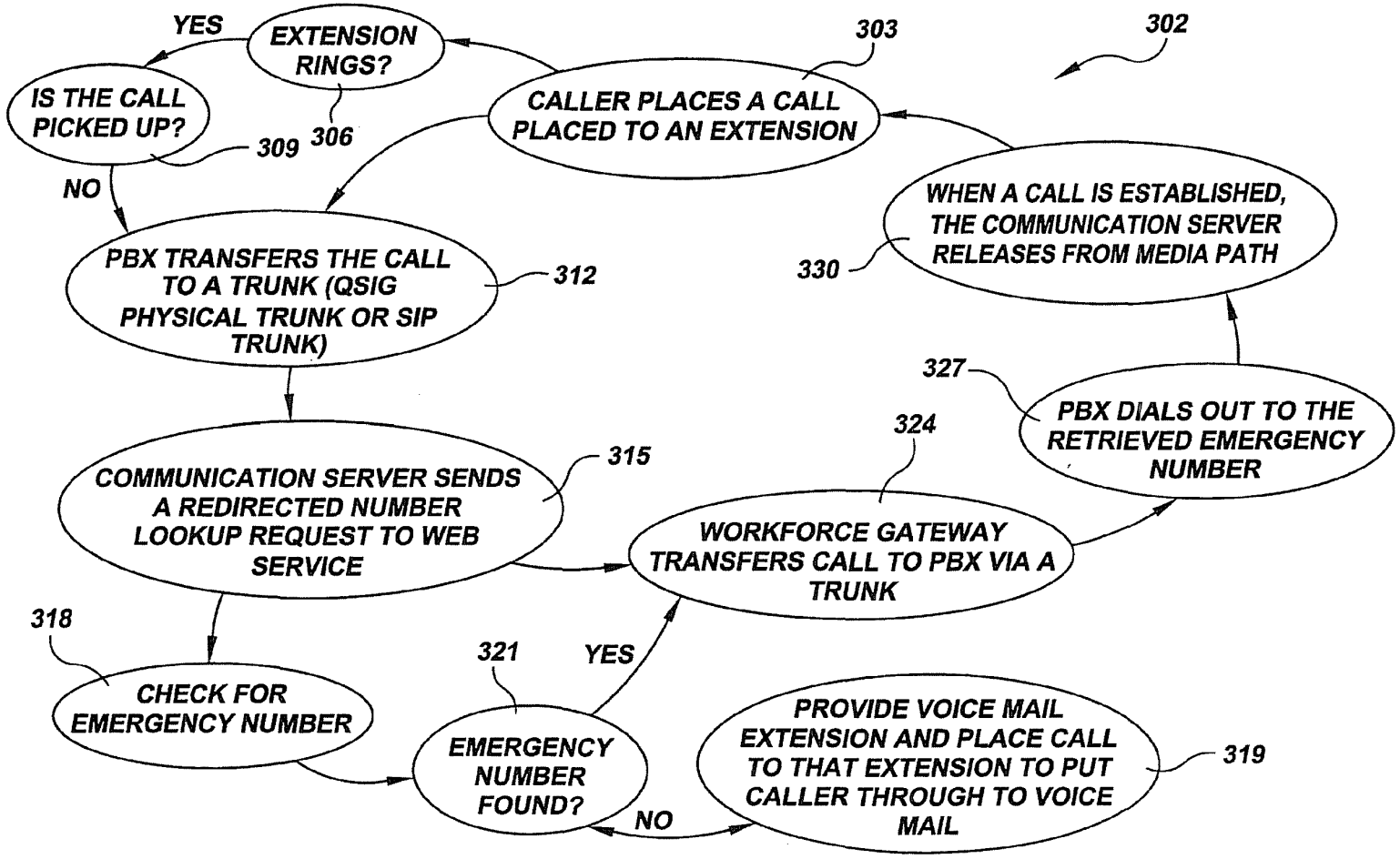

302
303
CALLER PLACES A CALL PLACED TO AN EXTENSION
EXTENSION RINGS?
306
YES
IS THE CALL PICKED UP?
309
NO
PBX TRANSFERS THE CALL TO A TRUNK (QSIG PHYSICAL TRUNK OR SIP TRUNK)
312
COMMUNICATION SERVER SENDS A REDIRECTED NUMBER LOOKUP REQUEST TO WEB SERVICE
315
318
CHECK FOR EMERGENCY NUMBER
321
EMERGENCY NUMBER FOUND?
YES
NO
WORKFORCE GATEWAY TRANSFERS CALL TO PBX VIA A TRUNK
324
PBX DIALS OUT TO THE RETRIEVED EMERGENCY NUMBER
327
WHEN A CALL IS ESTABLISHED, THE COMMUNICATION SERVER RELEASES FROM MEDIA PATH
330
PROVIDE VOICE MAIL EXTENSION AND PLACE CALL TO THAT EXTENSION TO PUT CALLER THROUGH TO VOICE MAIL
319

FIG. 1D

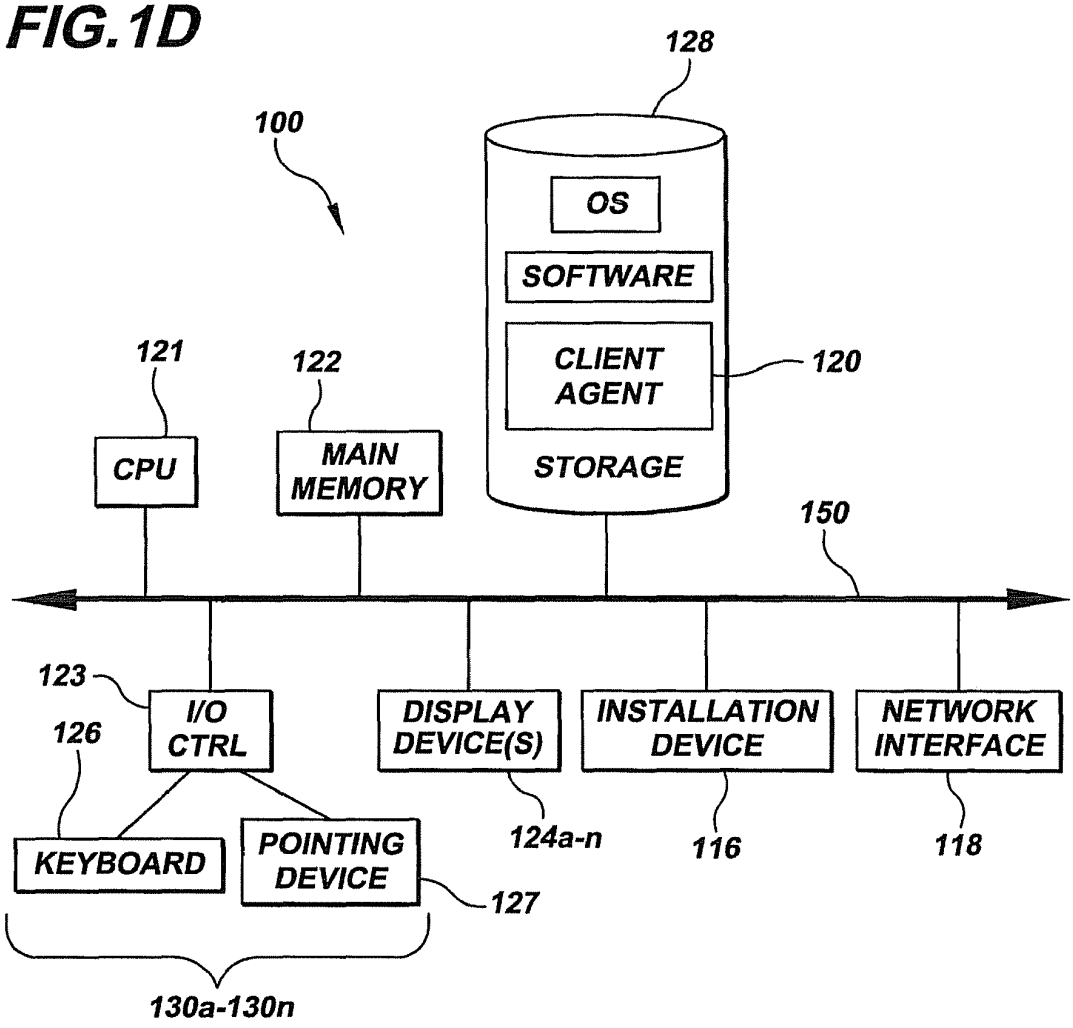

128
100
OS
SOFTWARE
CLIENT AGENT
120
121
122
CPU
MAIN MEMORY
STORAGE
150
123
I/O CTRL
DISPLAY DEVICE(S)
INSTALLATION DEVICE
NETWORK INTERFACE
126
KEYBOARD
POINTING DEVICE
124a-n
116
118
127
130a-130n

FIG.1E

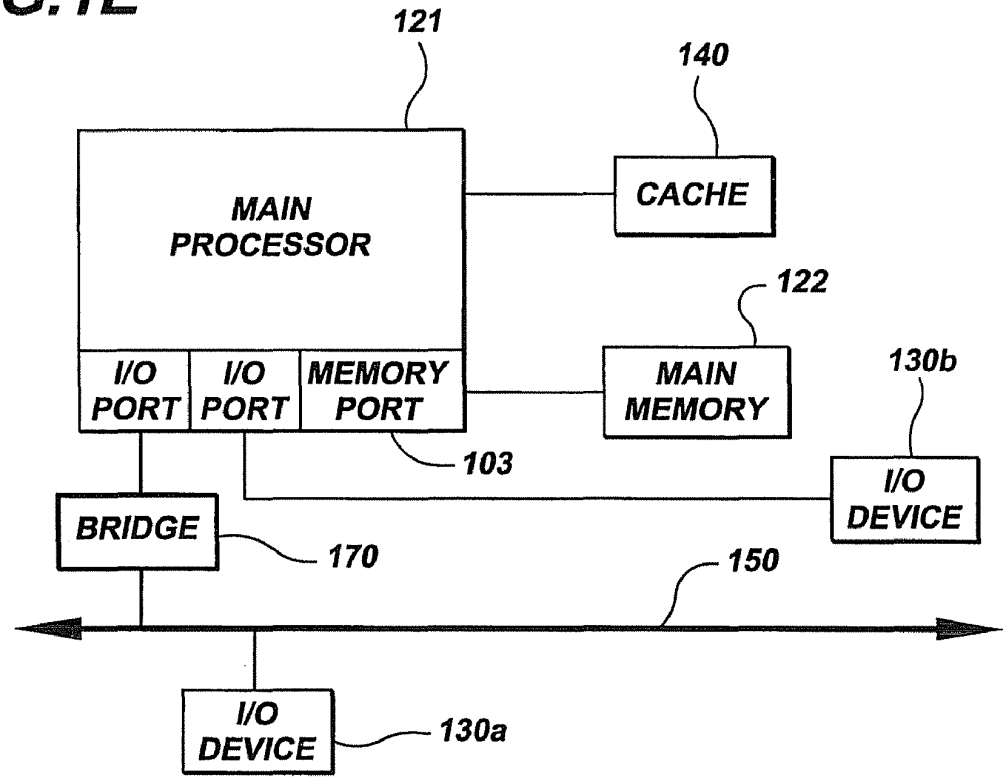

121
140
MAIN PROCESSOR
CACHE
122
I/O PORT
I/O PORT
MEMORY PORT
MAIN MEMORY
130b
103
I/O DEVICE
BRIDGE
170
150
I/O DEVICE
130a

FIG.2A

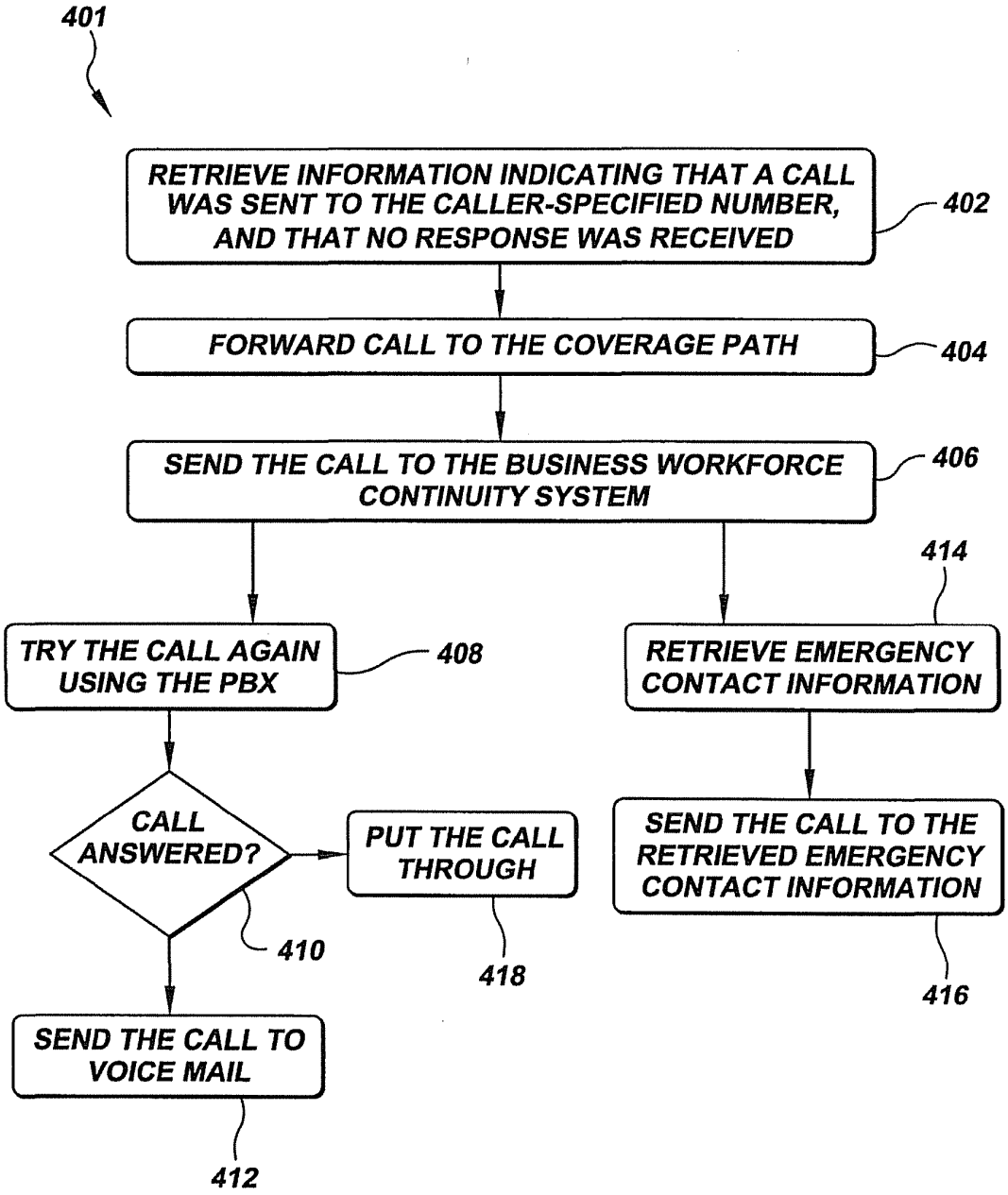

401
RETRIEVE INFORMATION INDICATING THAT A CALL WAS SENT TO THE CALLER-SPECIFIED NUMBER, AND THAT NO RESPONSE WAS RECEIVED
402
FORWARD CALL TO THE COVERAGE PATH
404
SEND THE CALL TO THE BUSINESS WORKFORCE CONTINUITY SYSTEM
406
414
TRY THE CALL AGAIN USING THE PBX
408
RETRIEVE EMERGENCY CONTACT INFORMATION
CALL ANSWERED?
PUT THE CALL THROUGH
SEND THE CALL TO THE RETRIEVED EMERGENCY CONTACT INFORMATION
410
418
416
SEND THE CALL TO VOICE MAIL
412

FIG.2B

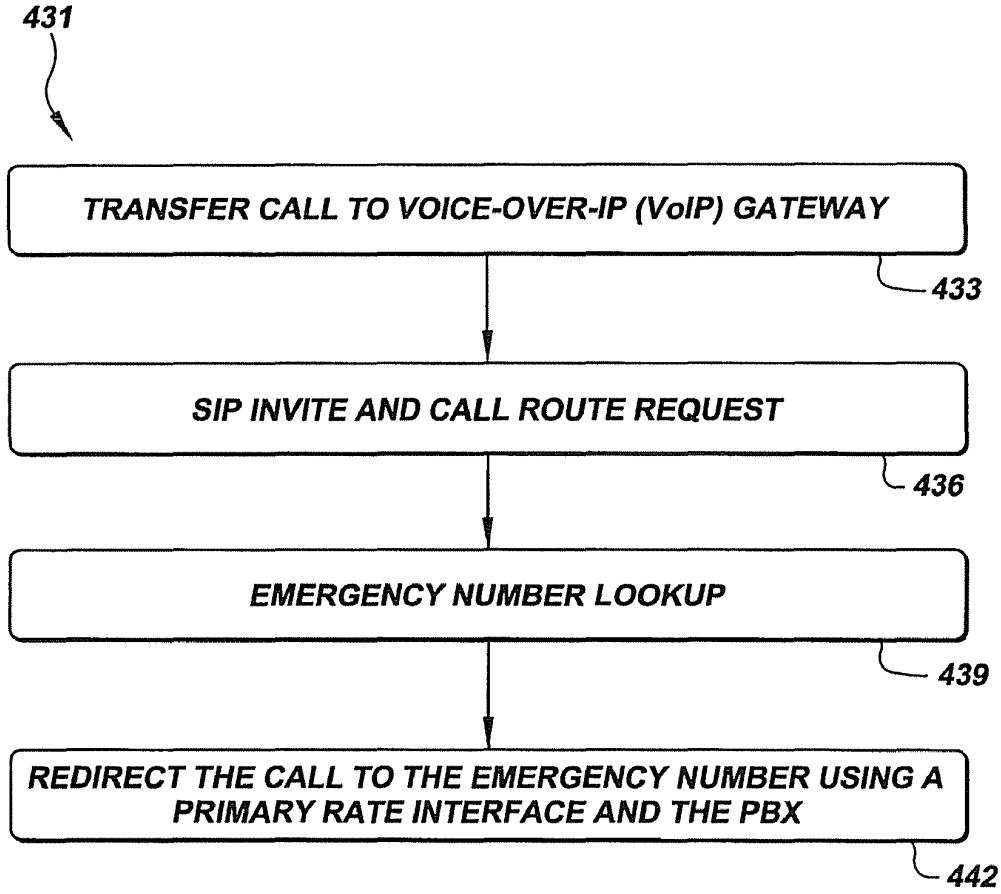

431
TRANSFER CALL TO VOICE-OVER-IP (VoIP) GATEWAY
433
SIP INVITE AND CALL ROUTE REQUEST
436
EMERGENCY NUMBER LOOKUP
439
REDIRECT THE CALL TO THE EMERGENCY NUMBER USING A PRIMARY RATE INTERFACE AND THE PBX
442

FIG.2C

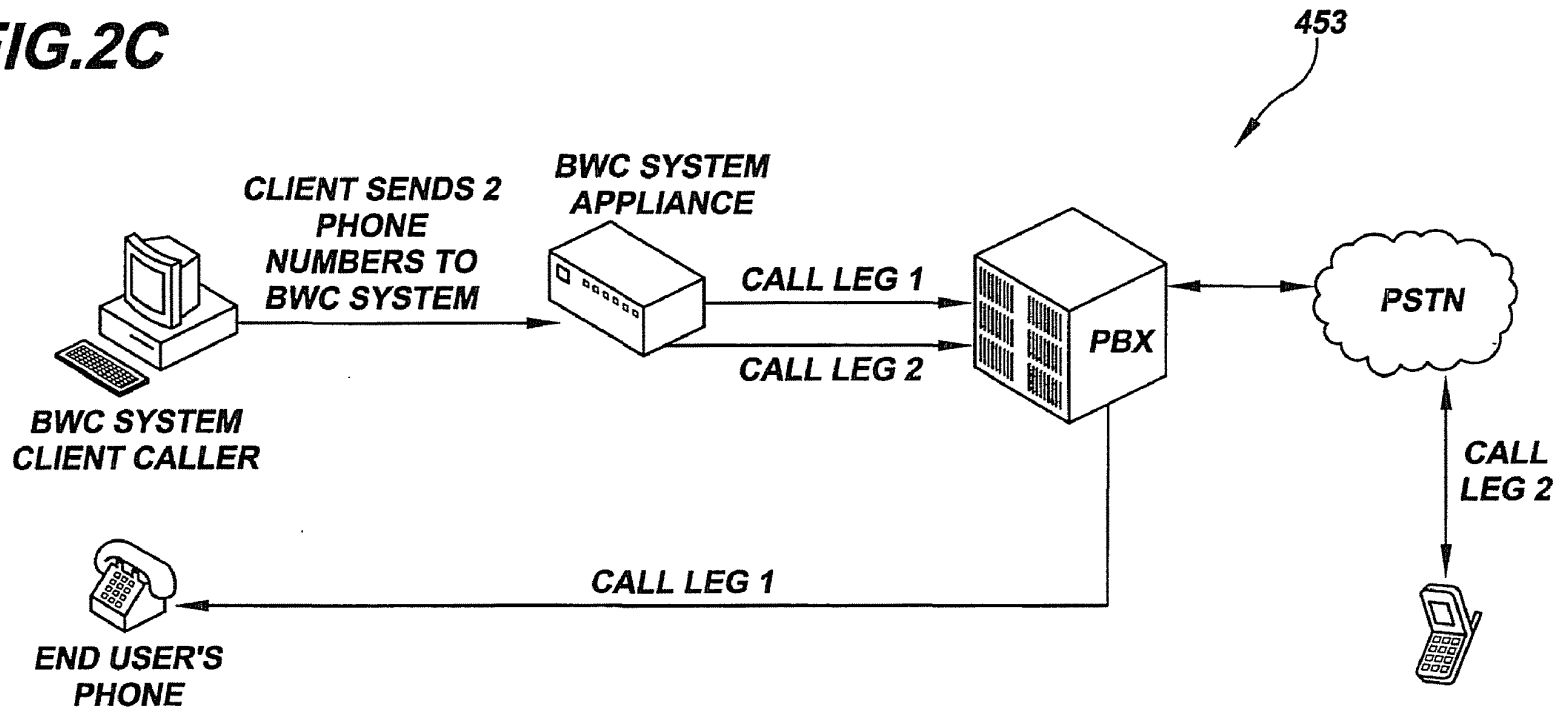

453
CLIENT SENDS 2 PHONE NUMBERS TO BWC SYSTEM
BWC SYSTEM APPLIANCE
CALL LEG 1
CALL LEG 2
PBX
PSTN
BWC SYSTEM CLIENT CALLER
CALL LEG 2
CALL LEG 1
END USER'S PHONE

FIG.2D

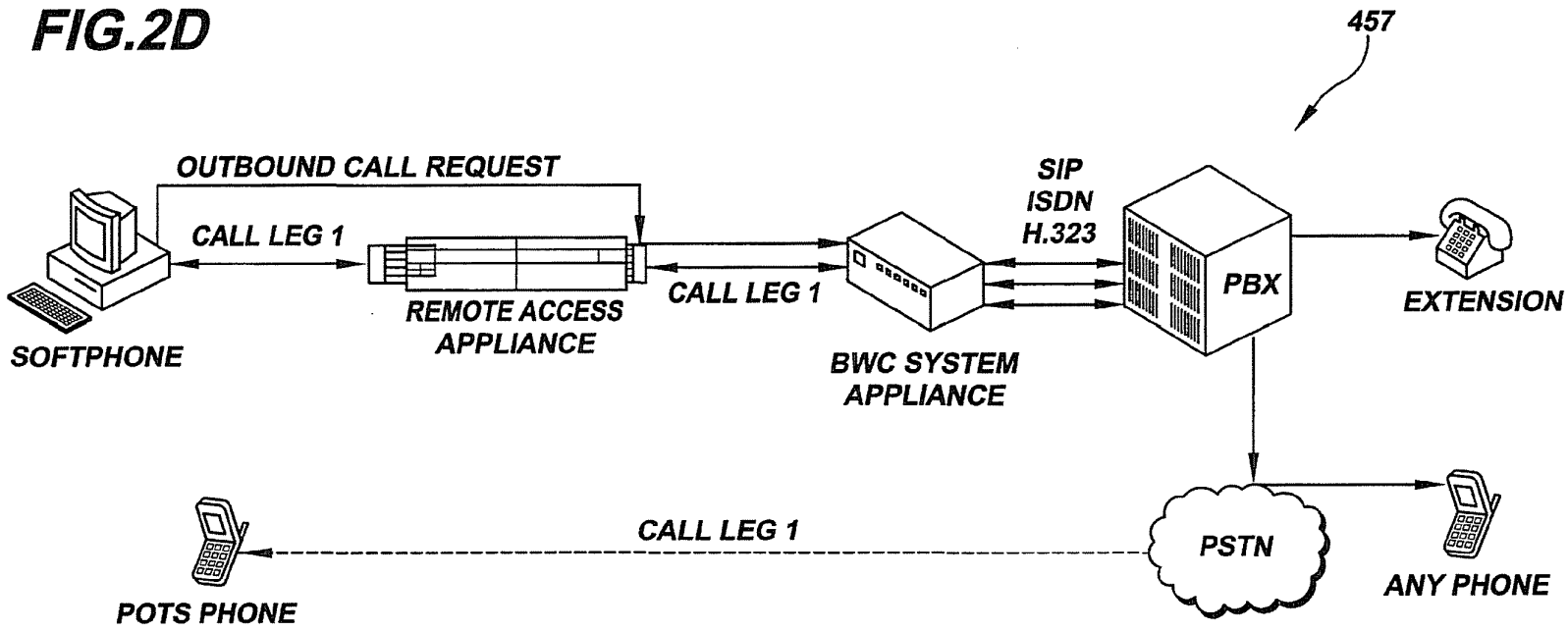

457
OUTBOUND CALL REQUEST
CALL LEG 1
SOFTPHONE
REMOTE ACCESS APPLIANCE
CALL LEG 1
BWC SYSTEM APPLIANCE
SIP
ISDN
H.323
PBX
EXTENSION
PSTN
ANY PHONE
CALL LEG 1
POTS PHONE

FIG.3A

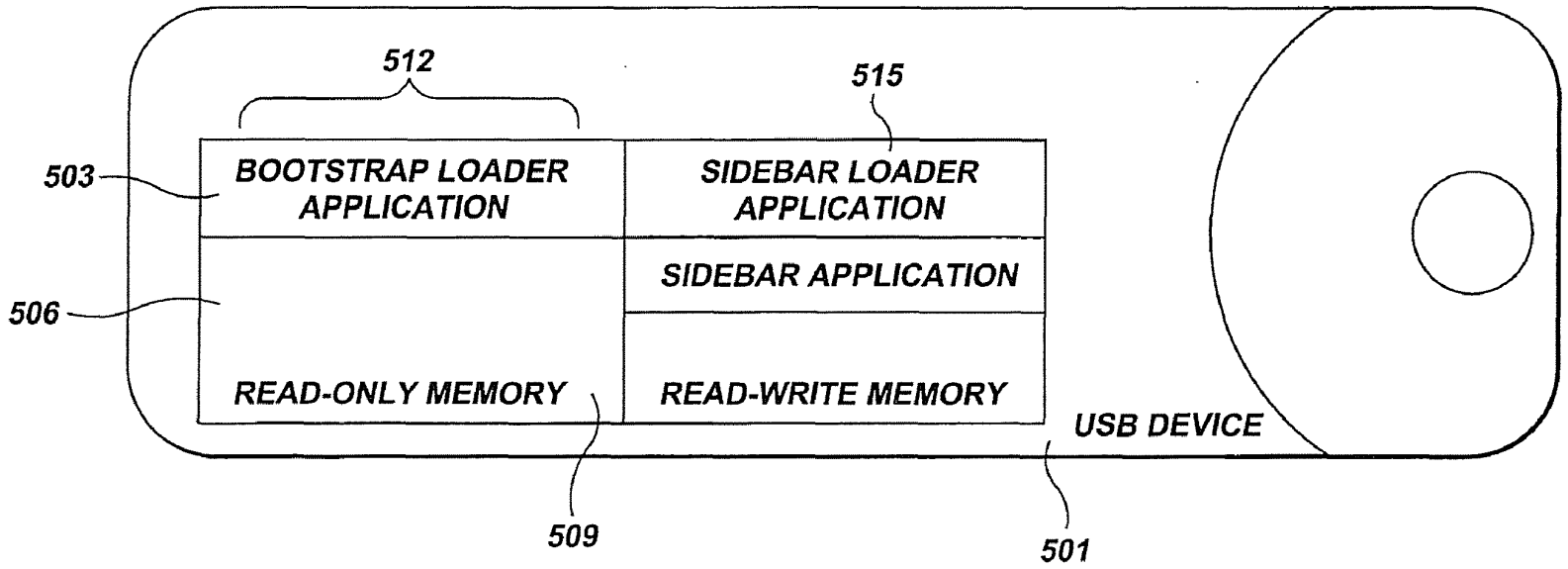

512
515
503
BOOTSTRAP LOADER APPLICATION
SIDEBAR LOADER APPLICATION
SIDEBAR APPLICATION
506
READ-ONLY MEMORY
READ-WRITE MEMORY
USB DEVICE
509
501

FIG.3B

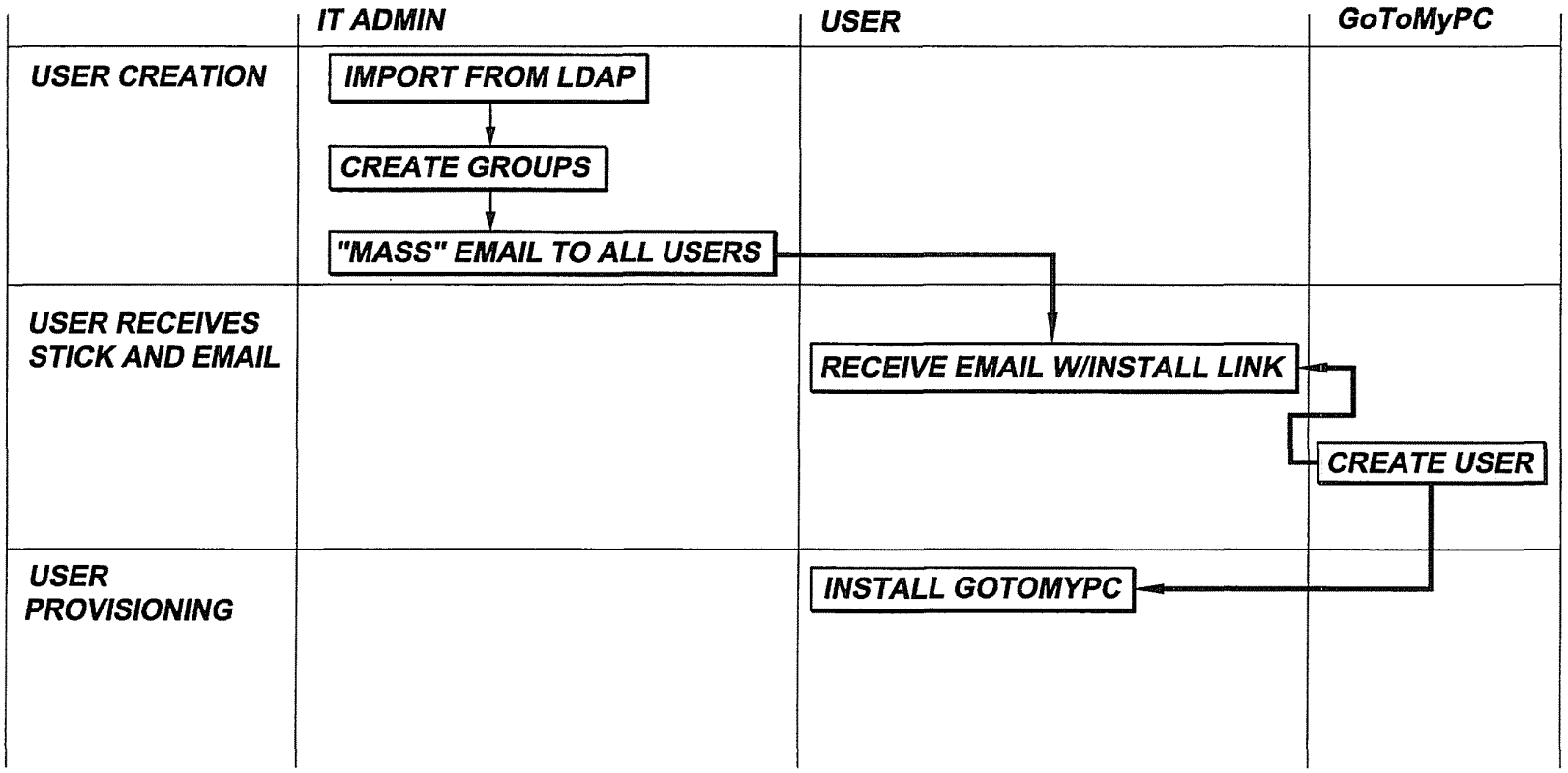

IT ADMIN
USER
GoToMyPC
USER CREATION
IMPORT FROM LDAP
CREATE GROUPS
"MASS" EMAIL TO ALL USERS
USER RECEIVES STICK AND EMAIL
RECEIVE EMAIL W/INSTALL LINK
CREATE USER
USER PROVISIONING
INSTALL GOTOMYPC

FIG.3C

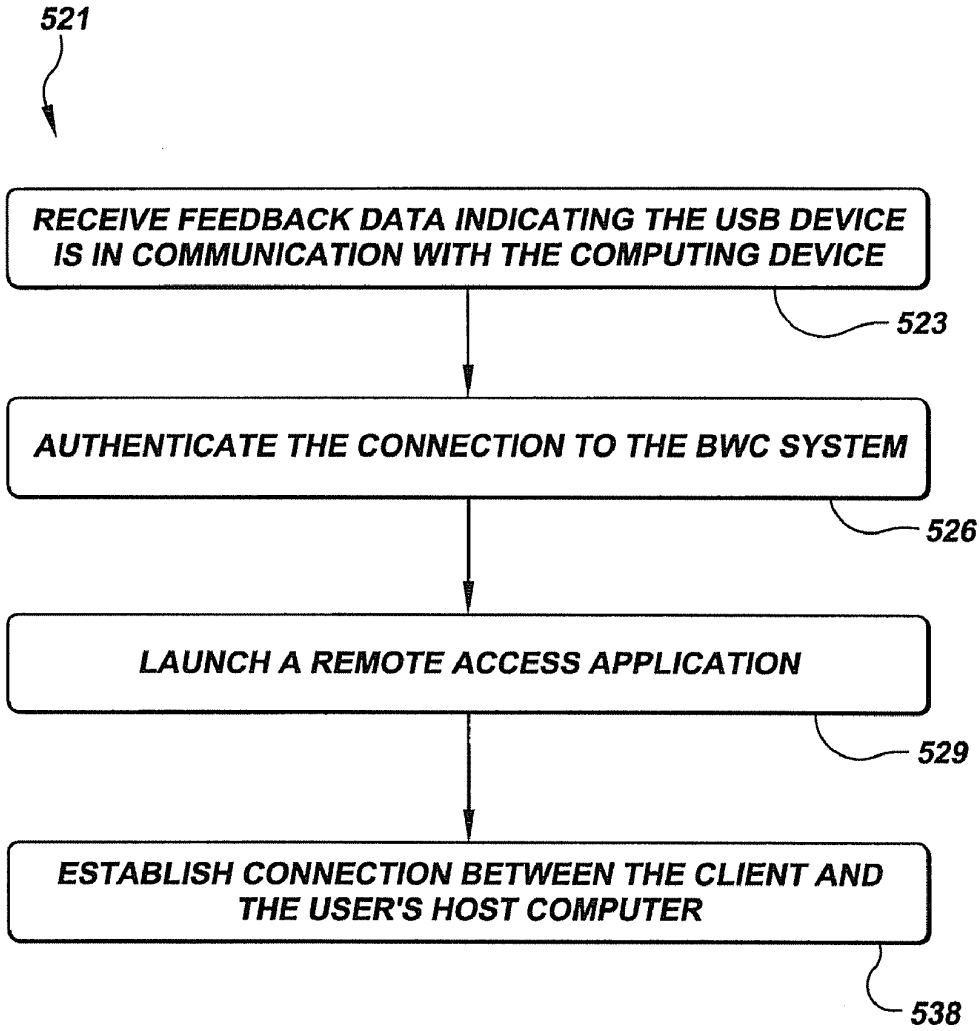
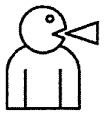

521
RECEIVE FEEDBACK DATA INDICATING THE USB DEVICE IS IN COMMUNICATION WITH THE COMPUTING DEVICE
523
AUTHENTICATE THE CONNECTION TO THE BWC SYSTEM
526
LAUNCH A REMOTE ACCESS APPLICATION
529
ESTABLISH CONNECTION BETWEEN THE CLIENT AND THE USER'S HOST COMPUTER
538

FIG.4A

PERSONAS



EMERGENCY RESPONSE TEAM (ERT):

PREPARE AND CONFIGURE SCENARIOS, GROUPS, ZONES. ACTIVATE EMERGENCY SITUATIONS, SEND NOTIFICATIONS. MANAGE ROLL CALL AND EMERGENCY WORKPLACE.

EMPLOYEES:

RECEIVE AND RESPOND TO ALERT NOTIFICATIONS. USE SIDEBAR AND EMERGENCY WORKPLACE TO WORK DURING EMERGENCY SITUATION.

MANAGERS:

USE THE PRODUCT TO ACCESS EMERGENCY SITUATION HISTORY & REPORTS

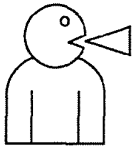
FIG.4B

USER FLOW ARCHITECTURE

	PREPARE	EMERGENCY	WORK
EMERGENCY RESPONSE TEAM (ERT)	PREPARE ZONES, GROUPS, SURVEYS & NOTIFICATIONS. CREATE, TEST & APPROVE EMERGENCY SCENARIOS.	ACTIVATE EMERGENCY SEND EMERGENCY ALERT NOTIFICATIONS UPDATE STATUS, ISSUE ANNOUNCEMENTS AND SURVEYS	
EMPLOYEE	RECEIVE EMAIL OF EXPLANATION RECEIVE USB DEVICE KIT	RECEIVE EMERGENCY ALERT NOTIFICATIONS RESPOND AND UPDATE CONTACT INFO PLUG IN USB DEVICE	USE SIDEBAR TO COLLABORATE WITH COLLEAGUES LAUNCH GOTOMYPC AND USE WORK COMPUTER REMOTELY
MANAGER	APPROVE SCENARIO	USE REMOTE WORKPLACE TO POST MESSAGES, READ STATUS UPDATES & ANSWER SURVEYS. MANAGE ROLL CALL	REPORTS & HISTORY

FIG.4C

ERT CREATES EMERGENCY SCENARIOS



ERT CREATES
- GROUPS
- ZONES
- SURVEYS
- NOTIFICATIONS
- SCENARIOS

New Group

Follow the four simple steps below to create a new Group

New Group Step 1

1. Name Group
2. Privileges
3. Members
4. Reserve & Save

Group name

Group Type (these settings control what privileges are available for this group)

- ☐ Administrators
- ☒ ERT members
- ☐ Managers
- ☐ Employees

CANCEL

EDIT SCENARIO WIZARD - STEP 1

1. Name & Description
2. Alert Notification
3. Status
4. Zones
5. Surveys
6. News & Resources
7. Review

Approval

Scenario Name:

Atlanta Hurricane

Scenario Descriptions:

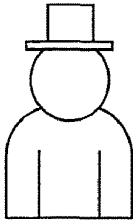
Hurricane maps, resources and news feeds included for a major hurricane warning or disaster in the Atlantic South region.

BACK NEXT

SAVE CANCEL

FIG.4D

MANAGERS APPROVE SCENARIOS



MANAGER APPROVES A SCENARIO

- MINIMUM NUMBER OF SIGNATURES REQUIRED

NEW SCENARIO WIZARD STEP 9

1. Start and Choose Scenario Source
2. Names & Description
3. Zones
4. Alerts
5. Status
6. Surveys
7. News & Resources

Scenarios must be approved by at least one other ERT Member to be deployed Select one or two ETR members below to receive a Scenario Approval Request Via email.

EMERGENCY RESPONSE TEAM

- ☒ Adam Kingsley
- ☐ Bob Woo
- ☐ Chris Singha
- ☒ Debbie Smith
- ☐ Earl Erlington
- ☐ Francine Black
- ☐ Heather Bishop

CANCEL

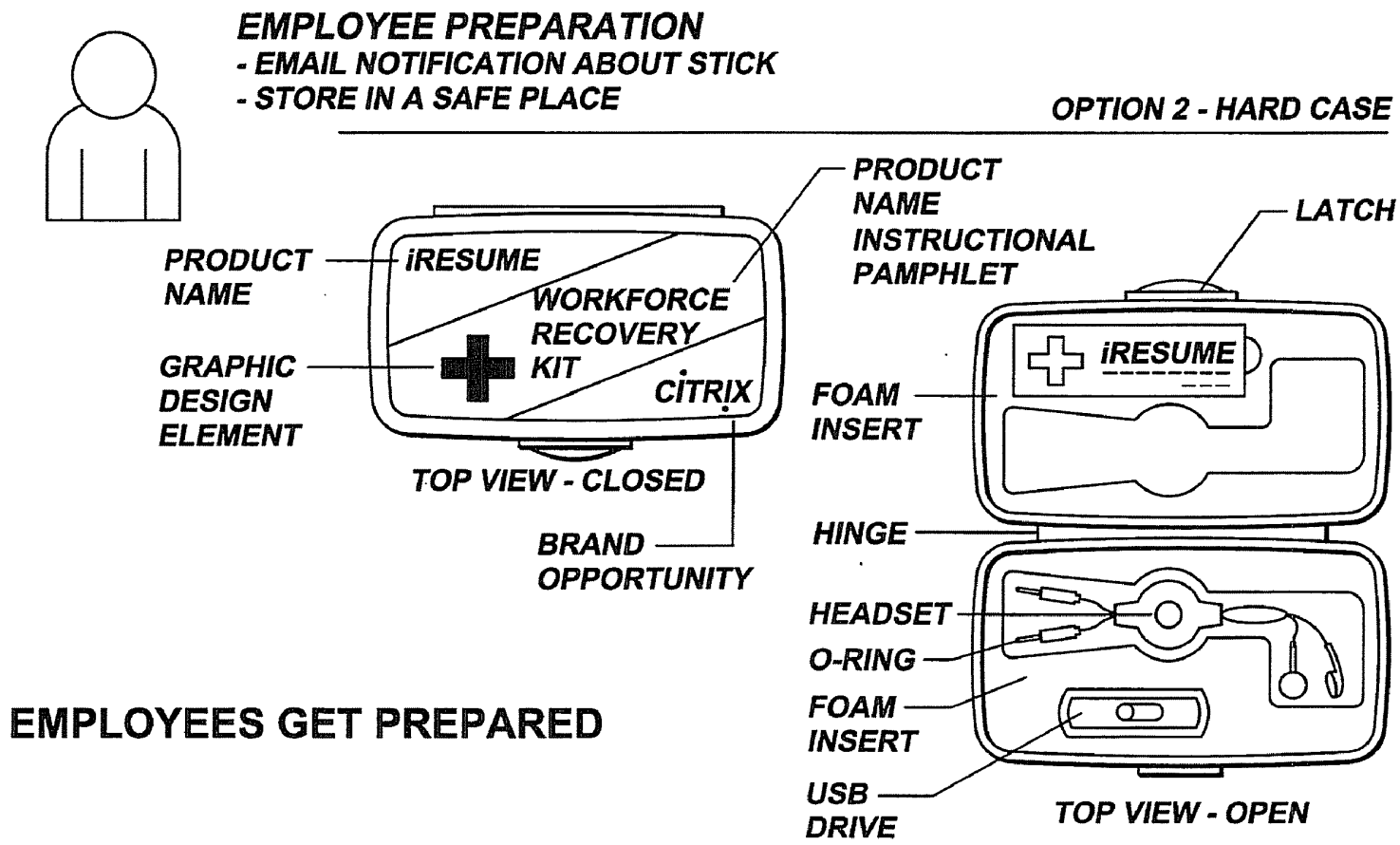
You have been asked to approve the new Emergency Scenario shown below. Please review the Scenario details below. When you are finished, click the Approve or Deny button. If you deny this Scenario please include comments explaining why.

Scenario Name: Atlanta Hurricane Southern Office Closure
▸ Scenario Description: A Hurricane warning for the southern coast of Georgia requires closure of the Offices.
★ Workflow: Urgent, every four hours until response received.
SMS Message: A Hurricane has forced office closure Respond and activate USB device.
▸ Email Message: A Hurricane has forced office closure for your area. If you have not
▸ Phone Message: A Hurricane has forced office closure Respond and activate USB device.
Voice Mail Message: <date stamps> A Hurricane has forced office closure for <selected zones>
Web Status Message: <date stamps> A Hurricane has forced office cloister for <selected zones> Dial 1-800-667-5500 to reply
Selected Zones: Atlantic South
Selected Survey: Family Health
News: Atlantic Times, Atlantic Special Edition, New York Times
Resources: Atlantic Employee Status Map, Hurricane Maps

APPROVE DENY

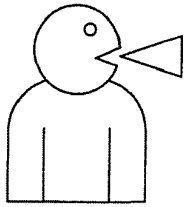
Include the reason for denying this Scenario here...

FIG.4E



EMPLOYEES GET PREPARED

FIG.4F



EMERGENCY TEST:

- LIKE THE REAL THING EXCEPT FOR A SMALLER GROUP
- ERT SELECTS A SCENARIO
- ERT ACTIVATES TEST SCENARIO
- SELECT TEST RECIPIENTS

ERTs TEST SCENARIO

TEST EMERGENCY STEP 6:ETE0060

TEST EMERGENCY STEP 6

1. Choose Scenario
2. Review Zones
3. Review Alert Notifications
4. Review Status Message
5. Request Activation Approval
6. Select Test Recipients

Select one or more ERT members to receive this Emergency Test

ERT: Miami Members

- ☒ Adam Kingsley
- ☐ Bob Woo
- ☐ Chris Singha
- ☐ Debbie Smith
- ☐ Earl Erlington
- ☐ Francine Black
- ☐ Heather Bishop
- ☐ John Snitherton
- Kevin Chan
- Michael Bloomberg

BACK NEXT

The following voice email and SMS messages will be sent to the test recipients you selected:

This is a test of the Emergency Activation System for the Miami Office Closure. This is only a test. This test was sent to you from David Dray. Please respond to acknowledge receiving this test message by:

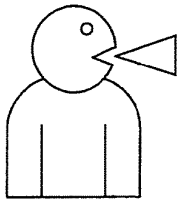
(VOICE) _____
(SMS) _____
(EMAIL) _____
(WEB) _____

Thank you for responding to this test of the Emergency Activation System.

ACTIVATE CANCEL

FIG.4G

ACTIVATE EMERGENCY



EMERGENCY ACTIVATION / NOTIFICATION:

- ERT SELECTS A SCENARIO
- ERT ACTIVATES EMERGENCY SCENARIO
- APPROVAL REQUESTS ARE ISSUED (OPTIONAL)
- USB DEVICES, SIDEBAR AND WEB WORKPLACE ACTIVATED

Remote Workplace Portal

Active Company Emergency Workplace — Welcome David Drew | Log Out

HOME | PREPARE | EMERGENCY (ACTIVE) | WORK | HELP — SEARCH

TEST | ACTIVATE | DEACTIVATE | APPROVALS | HISTORY & REPORTS

Emergency Approvals

The Tables below display the status of Emergency that has been sent for approval.

Active Emergency Scenarios Requiring Approval Then click on Emergency Name to view details and an associate name to send them an email.

Scenario Name	Approval	Status
Miami Office Closure	YOUR	NO approval
Activated 06/13/06	Janics Chin	Approved
11:23 EST	Chris Newinberg	Approved

Emergency Tests: I have Sent for Approval

Scenario Name	References	Response
Denver Blizzard	Steve Clean	Approved
Denver Traffic	Janics Chin	Approved

Emergency Test Approval Requests I Have Received

Scenario Name	References	Response
Denver Blizzard		
Denver Traffic		
San Francisco		
San Francisco		

Approve or Deny Emergency Activation

Your approval is necessary to activate the Emergency Scenario Activation
This Emergency Action Request was sent to you by Kathy Lee

Please review the Emergency details shown below carefully then click the
By clicking Activate, you will be initiating an Emergency Situation for 762

Scenario Name: Atlanta Hurricane Southern Office Closure
Scenario Description: A Hurricane warning for the southern coast of Georgia requires closed
Alert Workflow: Urgent, every four hours until response received.
Alert SMS Message: A Hurricane has forced office closure Respond and activate USB device.
Alert Email Message: A Hurricane has forced office closure for your area. If you have not
Alert Phone Message: A Hurricane has forced office closure Respond and activate USB device.
Voice Mail Message: <date stamps> A Hurricane has forced office closure for <selected zones>
Web Status Message: <date stamps> A Hurricane has forced office cloister for <selected zones> Dial 1-800-667-5500 to reply
Selected Zones: Atlantic South
Selected Survey: Family Health
News: Atlantic Times, Atlantic Special Edition, New York Times
Resources: Atlantic Employee Status Map, Hurricane Map

ACTIVATE | CANCEL

Include the reason for denying this Scenario here...

Activate Emergency : STEP 1

1. Choose Scenario
2. Review Zones
3. Review Alert Notifications
4. Review Status Message
5. Request Activation Approval

Chosen Emergency Scenario from the list below, then click the Next button.

Scenarios

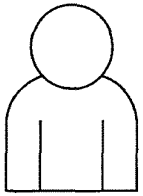
Atlanta Earthquake	Earthquake recourses and news feeds included.
Atlanta Flood	Flood and water damage resources and news feeds included
Atlanta Hurricane	Traffic maps resources and news feeds included
Atlanta Traffic Emergency	Traffic maps resources and news feeds included
Medical Pandemic	Medical resources and news feeds included
Generic Weather	Weather forecasts maps resources and news feeds included
Generic Office Closure	Generic resources and news feeds included
Miami Office Closure	Miami Office closed for construction 1-2 weeks closer
Miami Hurricane	Miami Office closed due to hurricane warning
Miami Traffic Closure	Miami Office closed due to traffic

BACK | NEXT

SAVE | CANCEL

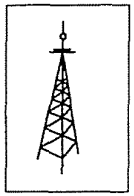
FIG.4H

EMPLOYEE NOTIFICATION

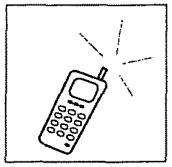


EMPLOYEE EMERGENCY NOTIFICATION

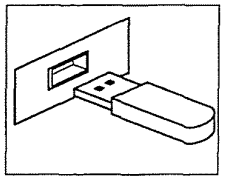
- ALERT ACTIVATED
- SMS & VOICE MESSAGES SENT
- EMPLOYEES RECEIVE MESSAGES, REPLAY AND UPDATE CONTACT INFORMATION
- PLUGIN USB DEVICE (IF AVAILABLE)



EMERGENCY ACTIVATED/ NOTIFICATIONS SENT



EMPLOYEES RECEIVE VOICE & SMS NOTIFICATIONS



EMPLOYEES PLUG IN USB DEVICE

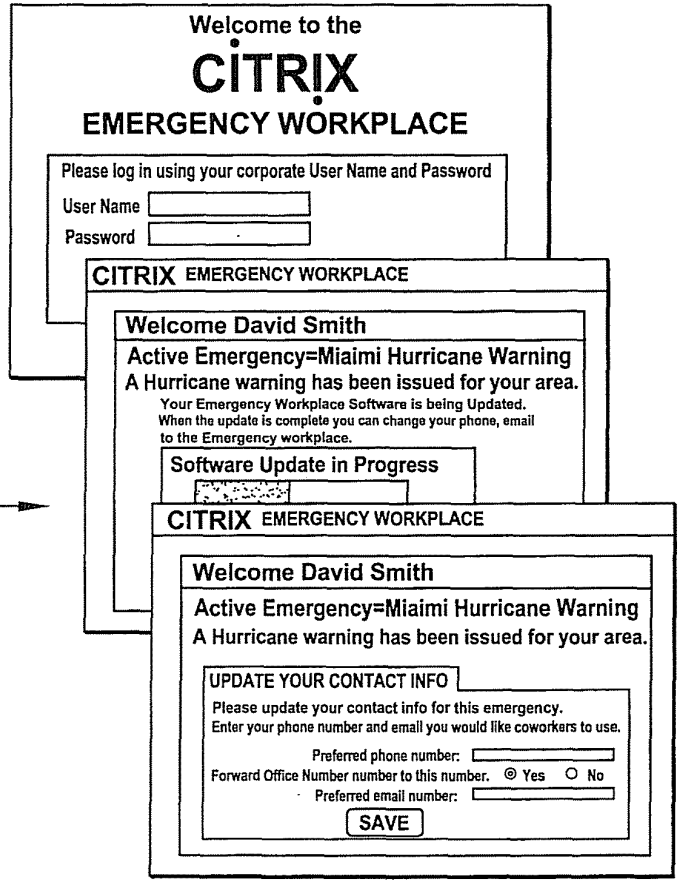
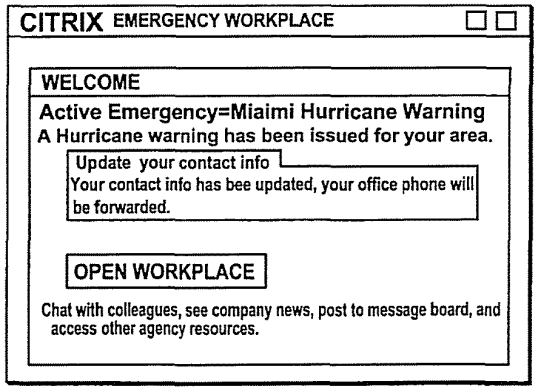
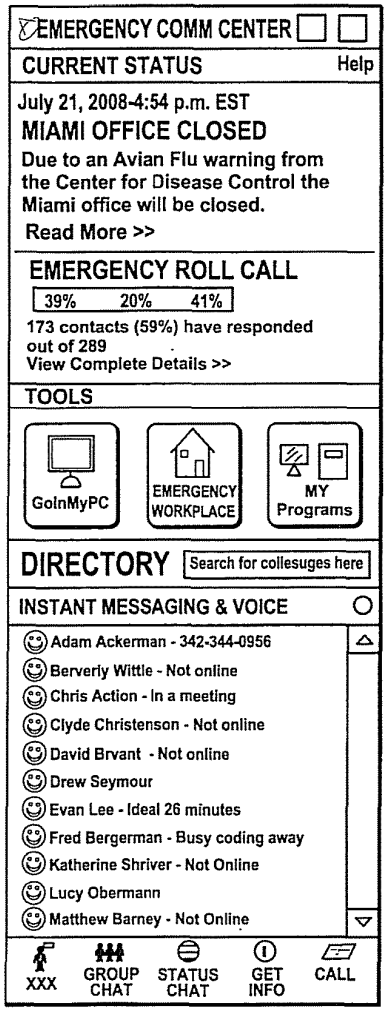


FIG.4I

SIDEBAR

- EASILY ACCESSIBLE
- DISPLAYS STATUS, ROLL CALL, IM, AND DIRECTORY
- LINKS TO CPS, PC, AND WORKPLACE

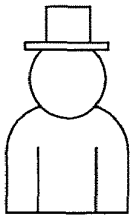




EMPLOYEE COMMUNICATIONS CENTER

FIG.4J

MANAGER'S ROLL CALL



MANAGER'S ROLL CALL

- GET LATEST ROLL CALL AND ESCALATE OR COMMUNICATE

HOME | PREPARE | EMERGENCY (Active) | WORK | HELP | SEARCH

Active Emergency ◉
Miami Medical Pandemic ◎

ROLL CALL | STATUS | ANNOUNCEMENTS | SURVEYS | NEWS | RESOURCES | MESSAGE BOARD

Roll Call Overview | 39% | 20% | 11% | 173 colleagues (59%) have responded out of 280 alerted.

126 (39%) have responded and are OK I 47(23%) have not responded I 127 (41%) have responded and are not OK I 1 (3%) inactive

Roll Call Details (289 employees) Click on Employee name to edit details PRINT EXPORT

SEND SMS MESSAGE | ADD USER TO ROLL CALL | Search foe individual here | SEARCH

FIRST NAME	LAST NAME	STATUS	DEPARTMENT	CONTACT	DATE AND TIME RESPONDED
☒ Abigail	Kingston		Finance		07/03/2006 14:23 EST
☐ Adam			HR		07/02/2006 11:58 EST
☐ Anna			IT		07/01/2006 21:23 EST
☐ Arthur			IT		07/03/2006 14:23 EST
☐ Beth			Product		07/03/2006 11:50 EST
☐ Bob			Operations		07/01/2006 21:13 EST
☐ Cathy			Support		07/03/2006 14:23 EST
☐ Chris			Finance		07/02/2006 11:58 EST
☐ David	Catherton		Legal		07/03/2006 14:23 EST
	Hunter		Accounting		07/02/2006 11:58 EST
	Lee		Accounting		07/01/2006 21:23 EST
	Overton		HR		07/03/2006 14:23 EST
	Smith		Executive Staff		07/03/2006 11:50 EST
	Bellview		Facilities		07/03/2006 14:23 EST
	Hubert		HR		07/02/2006 11:58 EST
	Douglas		Support		07/01/2006 21:23 EST
	Stephenson		IT		07/03/2006 14:23 EST
	Frank		Finance		07/03/2006 11:50 EST

Adam Grisley
654 First Avenue
Miami Fl 94064
Cell: 734-432-2343
Home: 435-432-1345
Email:agristly@acme.com

ADD FILTERS
Status
Department:
☒ Accounting
☒ Executive Staff
☒ Facilities
☒ Finance
☒ HR
☒ IT
☒ Legal
☒ Operations
☒ Product

HELP | FAQ | CONTACT SUPPORT

Edit User Details

Employee Name: Abigail Kingston Title: Accounting Manager

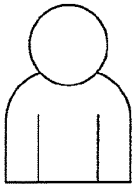
STATUS
- ○ ☐ Responded and OK
- ◉ ☐ Not Responded
- ○ ☐ Responded not OK
- ○ ☐ Responded not OK

PHONE NUMBER 503-453-4565

SAVE | CANCEL

FIG.4K

USERS USE EMERGENCY WORKPLACE



EMPLOYEE EMERGENCY WORKPLACE USAGE

- GET LATEST STATUS
- READ ANNOUNCEMENTS
- PARTICIPATE IN MESSAGE BOARDS

CITRIX EMERGENCY WORKPLACE Welcome David drew | Update My Contact Info SEARCH

HOME PREPARE EMERGENCY WORK HELP

CURRENT STATUS

July 21, 2008-4:54 p.m. EST

MIAMI OFFICE CLOSED

Due to an Avian Flu warning from the Center for Disease Control the Miami office will be closed starting the morning of July 22, 2006. Employees are asked to work from home for the next week or until otherwise advised.

EMERGENCY ROLL CALL

39%	20%	41%

173 contacts (59%) have responded out of 289

MESSAGE BOARD (87)

Anyone have an extra fridge? 11 responses
Read Reply >> Post Reply >>

Kevin Porters wife is in the hospital
76 responses Read Reply >> Post Reply >>

I am looking for an old video game console
4 responses Read Reply >> Post Reply >>

Any suggestions what to do with board kids?
3 responses Read Reply >> Post Reply >>

ANNOUNCEMENTS (11)

Free medical advice for Acme employees and families. Call 1-800-766-5454 Read More >>

Need a laptop? Other office equipment? Fill out this form:
Support Request Form >>
Read More >>

SERVERS (2)

1.) Does anyone have any extra laptop they could mail to a member who needs one?
REPLY

2.) Does anyone have any extra cell phone?
REPLY

RESOURCES

Maps medical advice, emergency checklists and more useful information.
View All >>

NEWS

Live News from CNN and The New York Times as well as local papers
View All >>

EMERGENCY COMM CENTER

CURRENT STATUS Help

July 21, 2008-4:54 p.m. EST

MIAMI OFFICE CLOSED

Due to an Avian Flu warning from the Center for Disease Control the Miami office will be closed.

Read More >>

EMERGENCY ROLL CALL

39%	20%	41%

173 contacts (59%) have responded out of 289
View Complete Details >>

TOOLS

GoInMyPC | EMERGENCY WORKPLACE | MY Programs

DIRECTORY Search for....

INSTANT MESSAGING & VOICE

- Adam Ackerman - 342-344-0956
- Beverly Wittle - Not online
- Chris Action - In a meeting
- Clyde Christenson - Not online
- David Brvant - Not online
- Drew Seymour
- Evan Lee - Ideal 26 minutes
- Fred Bergerman - Busy coding away
- Katherine Shriver - Not Online
- Lucy Obermann
- Matthew Barney - Not Online

XXX | GROUP CHAT | STATUS CHAT | GET INFO | CALL

FIG.4L

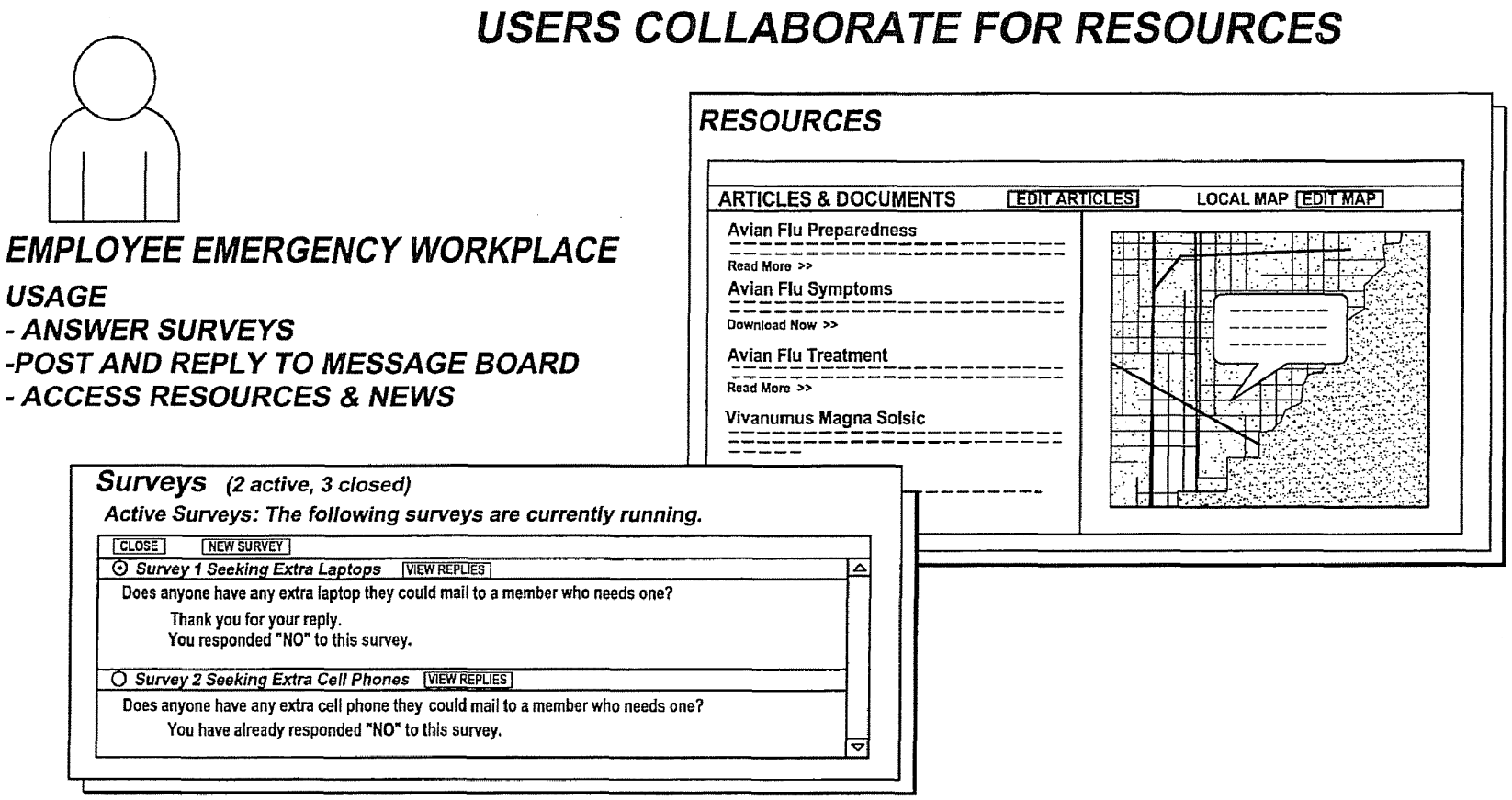
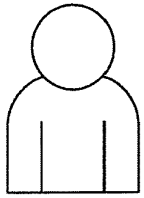
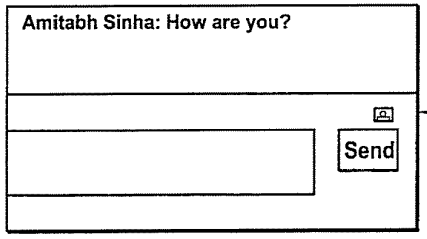

USERS COLLABORATE FOR RESOURCES
EMPLOYEE EMERGENCY WORKPLACE
USAGE
- ANSWER SURVEYS
-POST AND REPLY TO MESSAGE BOARD
- ACCESS RESOURCES & NEWS
RESOURCES
ARTICLES & DOCUMENTS
EDIT ARTICLES
LOCAL MAP
EDIT MAP
Avian Flu Preparedness
Read More >>
Avian Flu Symptoms
Download Now >>
Avian Flu Treatment
Read More >>
Vivanumus Magna Solsic
Surveys (2 active, 3 closed)
Active Surveys: The following surveys are currently running.
CLOSE
NEW SURVEY
Survey 1 Seeking Extra Laptops
VIEW REPLIES
Does anyone have any extra laptop they could mail to a member who needs one?
Thank you for your reply.
You responded "NO" to this survey.
Survey 2 Seeking Extra Cell Phones
VIEW REPLIES
Does anyone have any extra cell phone they could mail to a member who needs one?
You have already responded "NO" to this survey.

FIG.4M USERS COMMUNICATE WITH PEERS

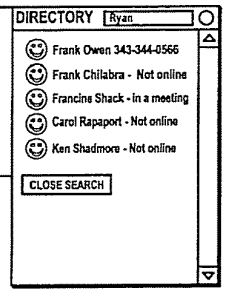


COMMUNICATIONS

- SEARCH CORPORATE DIRECTORY
- INBOUND PHONE CALLS ARE REDIRECTED FROM OFFICE TO NEW NUMBER
- PLACE OUTBOUND CALLS
- CHAT



CLICK TO CHAT



CLICK TO CALL USER

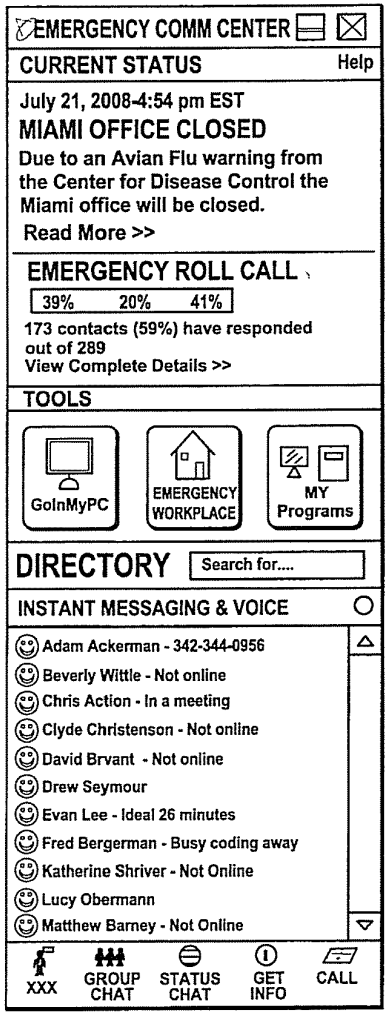
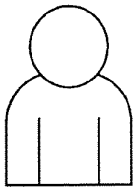


FIG.4N



CPS APPLICATIONS

GET BACK TO WORK!

ACCESS OFFICE PC

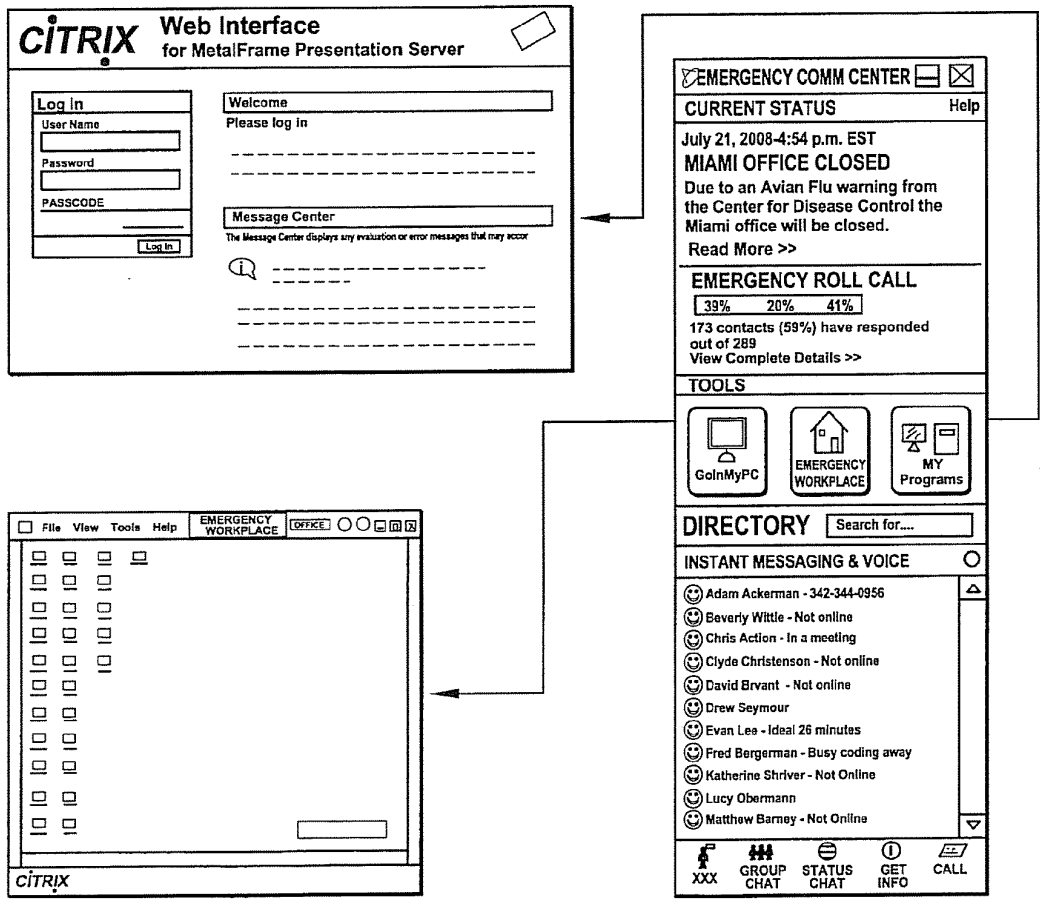


FIG.5A

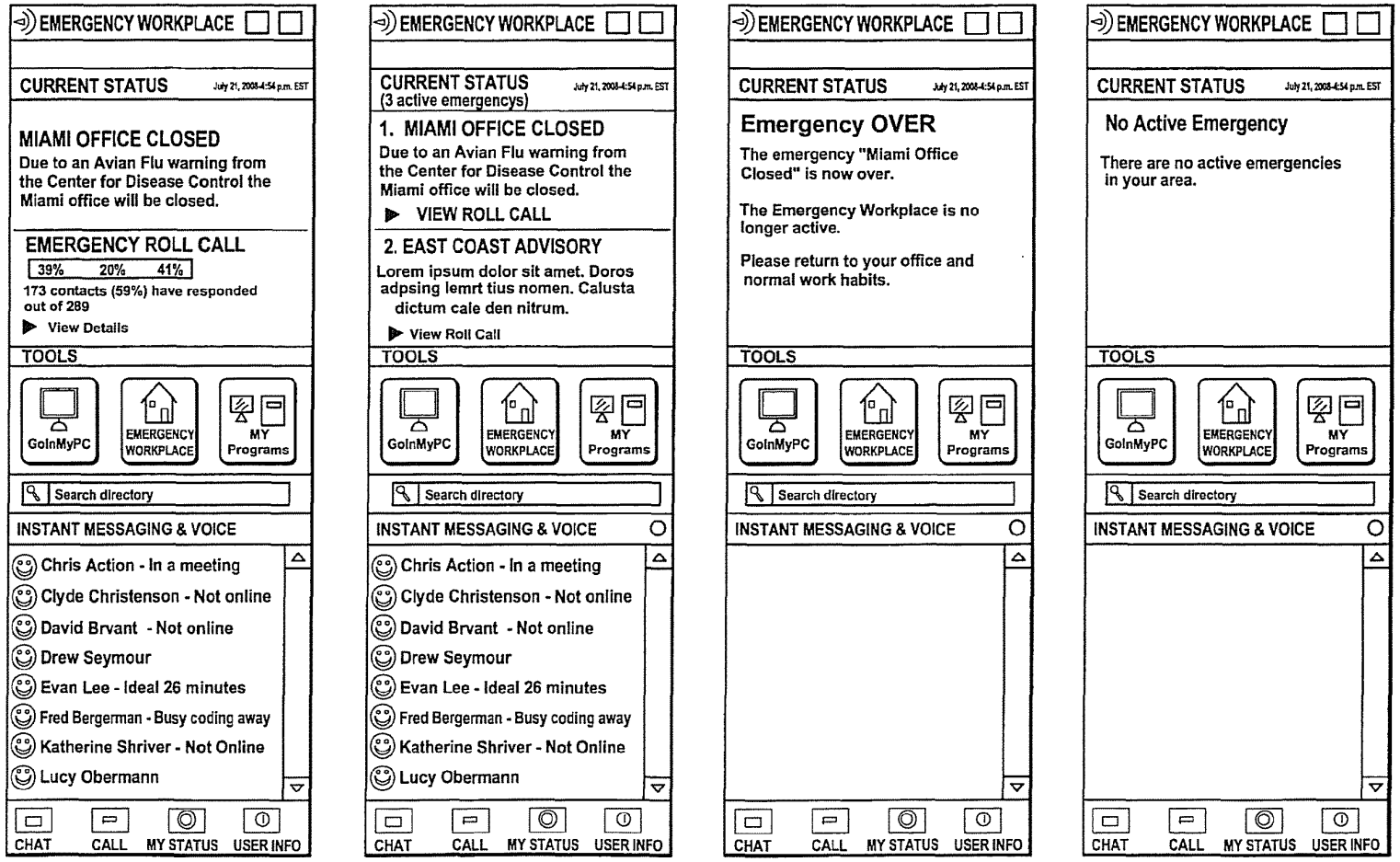

EMERGENCY WORKPLACE
CURRENT STATUS
July 21, 2008-4:54 p.m. EST
MIAMI OFFICE CLOSED
Due to an Avian Flu warning from the Center for Disease Control the Miami office will be closed.
EMERGENCY ROLL CALL
39% 20% 41%
173 contacts (59%) have responded out of 289
View Details
TOOLS
GoInMyPC
EMERGENCY WORKPLACE
MY Programs
Search directory
INSTANT MESSAGING & VOICE
Chris Action - In a meeting
Clyde Christenson - Not online
David Brvant - Not online
Drew Seymour
Evan Lee - Ideal 26 minutes
Fred Bergerman - Busy coding away
Katherine Shriver - Not Online
Lucy Obermann
CHAT
CALL
MY STATUS
USER INFO
EMERGENCY WORKPLACE
CURRENT STATUS (3 active emergencys)
July 21, 2008-4:54 p.m. EST
1. MIAMI OFFICE CLOSED
Due to an Avian Flu warning from the Center for Disease Control the Miami office will be closed.
VIEW ROLL CALL
2. EAST COAST ADVISORY
Lorem ipsum dolor sit amet. Doros adpsing lemrt tius nomen. Calusta dictum cale den nitrum.
View Roll Call
TOOLS
GoInMyPC
EMERGENCY WORKPLACE
MY Programs
Search directory
INSTANT MESSAGING & VOICE
Chris Action - In a meeting
Clyde Christenson - Not online
David Brvant - Not online
Drew Seymour
Evan Lee - Ideal 26 minutes
Fred Bergerman - Busy coding away
Katherine Shriver - Not Online
Lucy Obermann
CHAT
CALL
MY STATUS
USER INFO
EMERGENCY WORKPLACE
CURRENT STATUS
July 21, 2008-4:54 p.m. EST
Emergency OVER
The emergency "Miami Office Closed" is now over.
The Emergency Workplace is no longer active.
Please return to your office and normal work habits.
TOOLS
GoInMyPC
EMERGENCY WORKPLACE
MY Programs
Search directory
INSTANT MESSAGING & VOICE
CHAT
CALL
MY STATUS
USER INFO
EMERGENCY WORKPLACE
CURRENT STATUS
July 21, 2008-4:54 p.m. EST
No Active Emergency
There are no active emergencies in your area.
TOOLS
GoInMyPC
EMERGENCY WORKPLACE
MY Programs
Search directory
INSTANT MESSAGING & VOICE
CHAT
CALL
MY STATUS
USER INFO

FIG.5B

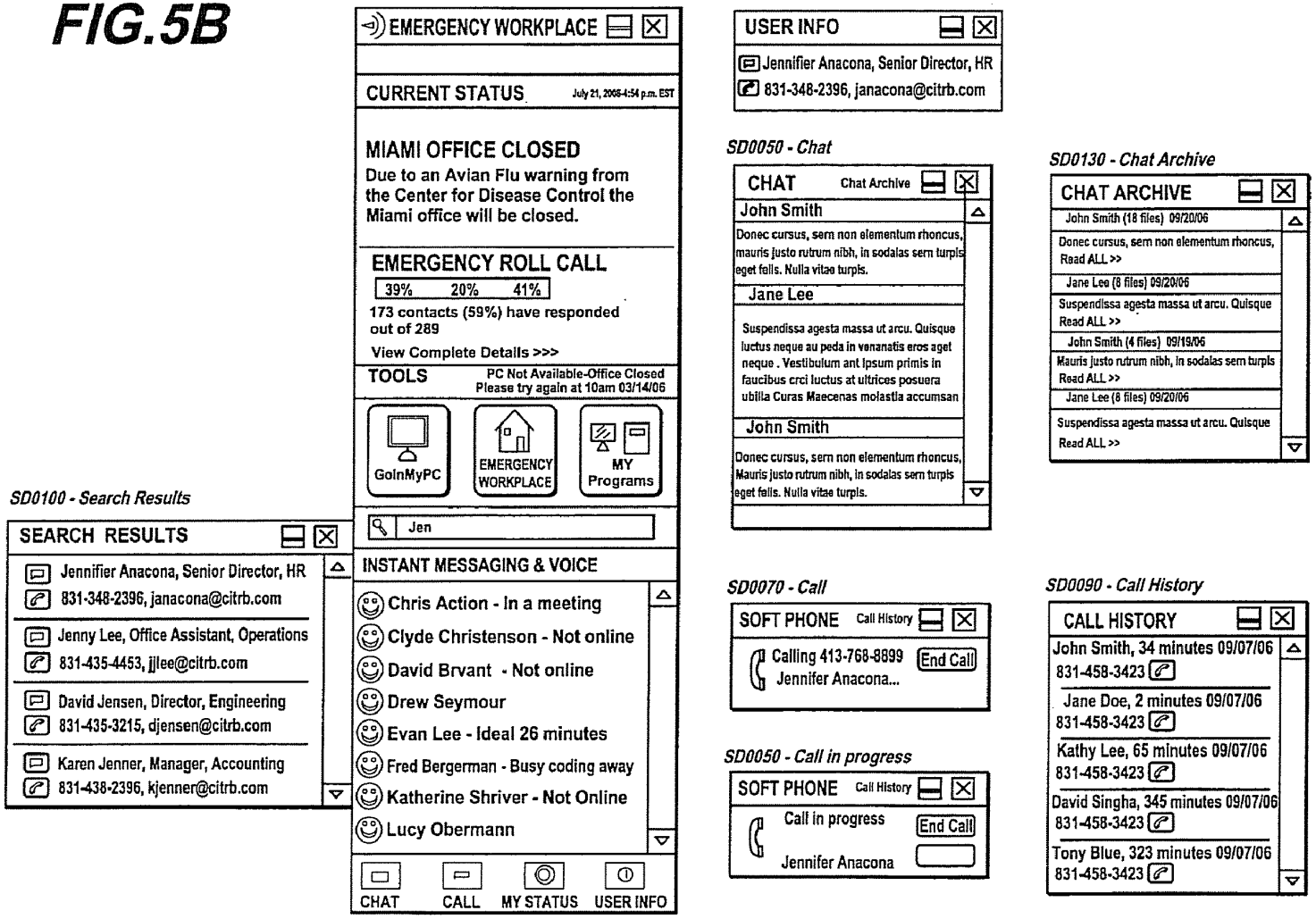
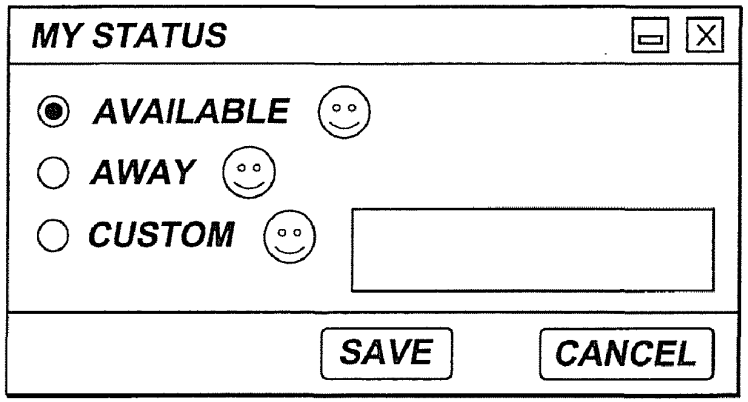

EMERGENCY WORKPLACE
CURRENT STATUS
July 21, 2006-4:54 p.m. EST
MIAMI OFFICE CLOSED
Due to an Avian Flu warning from the Center for Disease Control the Miami office will be closed.
EMERGENCY ROLL CALL
39% 20% 41%
173 contacts (59%) have responded out of 289
View Complete Details >>>
TOOLS
PC Not Available-Office Closed Please try again at 10am 03/14/06
GoInMyPC
EMERGENCY WORKPLACE
MY Programs
Jen
INSTANT MESSAGING & VOICE
Chris Action - In a meeting
Clyde Christenson - Not online
David Brvant - Not online
Drew Seymour
Evan Lee - Ideal 26 minutes
Fred Bergerman - Busy coding away
Katherine Shriver - Not Online
Lucy Obermann
CHAT
CALL
MY STATUS
USER INFO
SD0100 - Search Results
SEARCH RESULTS
Jennifier Anacona, Senior Director, HR
831-348-2396, janacona@citrb.com
Jenny Lee, Office Assistant, Operations
831-435-4453, jjlee@citrb.com
David Jensen, Director, Engineering
831-435-3215, djensen@citrb.com
Karen Jenner, Manager, Accounting
831-438-2396, kjenner@citrb.com
USER INFO
Jennifier Anacona, Senior Director, HR
831-348-2396, janacona@citrb.com
SD0050 - Chat
CHAT
Chat Archive
John Smith
Donec cursus, sem non elementum rhoncus, mauris justo rutrum nibh, in sodalas sem turpis eget felis. Nulla vitae turpis.
Jane Lee
Suspendissa agesta massa ut arcu. Quisque luctus neque au peda in venanatis eros aget neque . Vestibulum ant Ipsum primis in faucibus orci luctus at ultrices posuera ubilla Curas Maecenas molastia accumsan
John Smith
Donec cursus, sem non elementum rhoncus, Mauris justo rutrum nibh, in sodalas sem turpis eget felis. Nulla vitae turpis.
SD0130 - Chat Archive
CHAT ARCHIVE
John Smith (18 files) 09/20/06
Donec cursus, sem non elementum rhoncus, Read ALL >>
Jane Lee (8 files) 09/20/06
Suspendissa agesta massa ut arcu. Quisque Read ALL >>
John Smith (4 files) 09/19/06
Mauris justo rutrum nibh, in sodalas sem turpis Read ALL >>
Jane Lee (8 files) 09/20/06
Suspendissa agesta massa ut arcu. Quisque Read ALL >>
SD0070 - Call
SOFT PHONE
Call History
Calling 413-768-8899 Jennifer Anacona...
End Call
SD0050 - Call in progress
SOFT PHONE
Call History
Call in progress
Jennifer Anacona
End Call
SD0090 - Call History
CALL HISTORY
John Smith, 34 minutes 09/07/06
831-458-3423
Jane Doe, 2 minutes 09/07/06
831-458-3423
Kathy Lee, 65 minutes 09/07/06
831-458-3423
David Singha, 345 minutes 09/07/06
831-458-3423
Tony Blue, 323 minutes 09/07/06
831-458-3423

FIG.5C


MY STATUS
AVAILABLE
AWAY
CUSTOM
SAVE
CANCEL

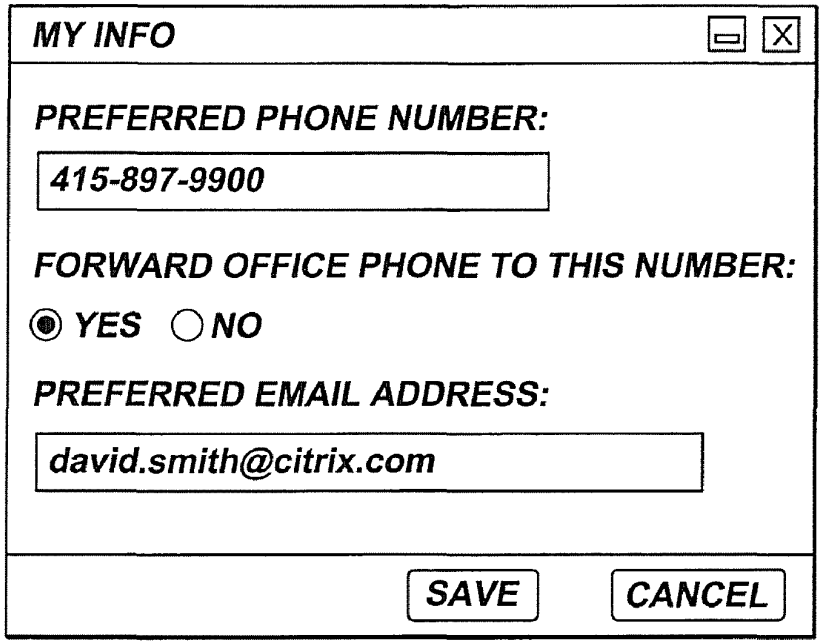

MY INFO
PREFERRED PHONE NUMBER:
415-897-9900
FORWARD OFFICE PHONE TO THIS NUMBER:
YES
NO
PREFERRED EMAIL ADDRESS:
david.smith@citrix.com
SAVE
CANCEL

FIG.6A

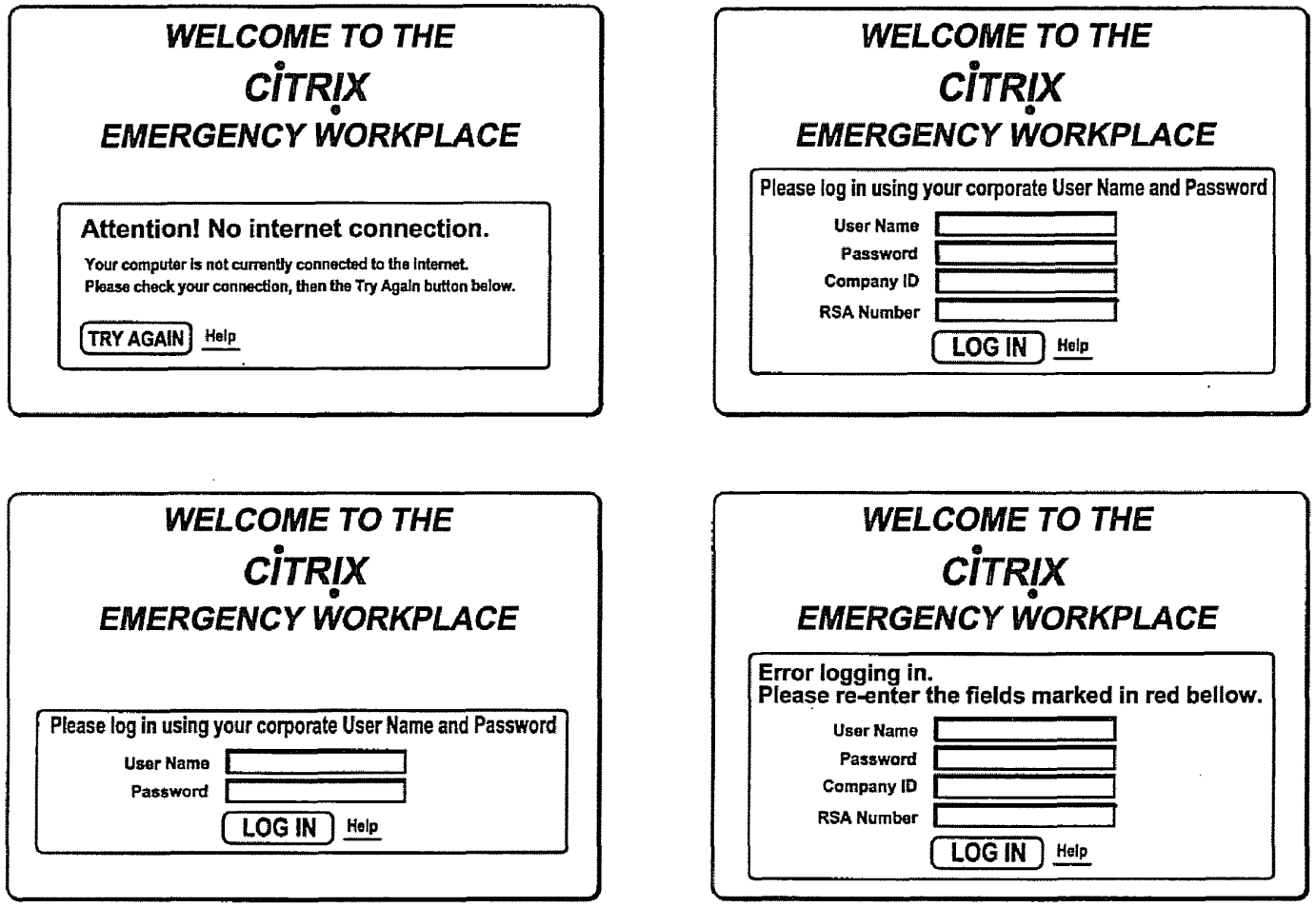

WELCOME TO THE
CITRIX
EMERGENCY WORKPLACE
Attention! No internet connection.
Your computer is not currently connected to the Internet.
Please check your connection, then the Try Again button below.
TRY AGAIN
Help
WELCOME TO THE
CITRIX
EMERGENCY WORKPLACE
Please log in using your corporate User Name and Password
User Name
Password
Company ID
RSA Number
LOG IN
Help
WELCOME TO THE
CITRIX
EMERGENCY WORKPLACE
Please log in using your corporate User Name and Password
User Name
Password
LOG IN
Help
WELCOME TO THE
CITRIX
EMERGENCY WORKPLACE
Error logging in.
Please re-enter the fields marked in red bellow.
User Name
Password
Company ID
RSA Number
LOG IN
Help

FIG.6B

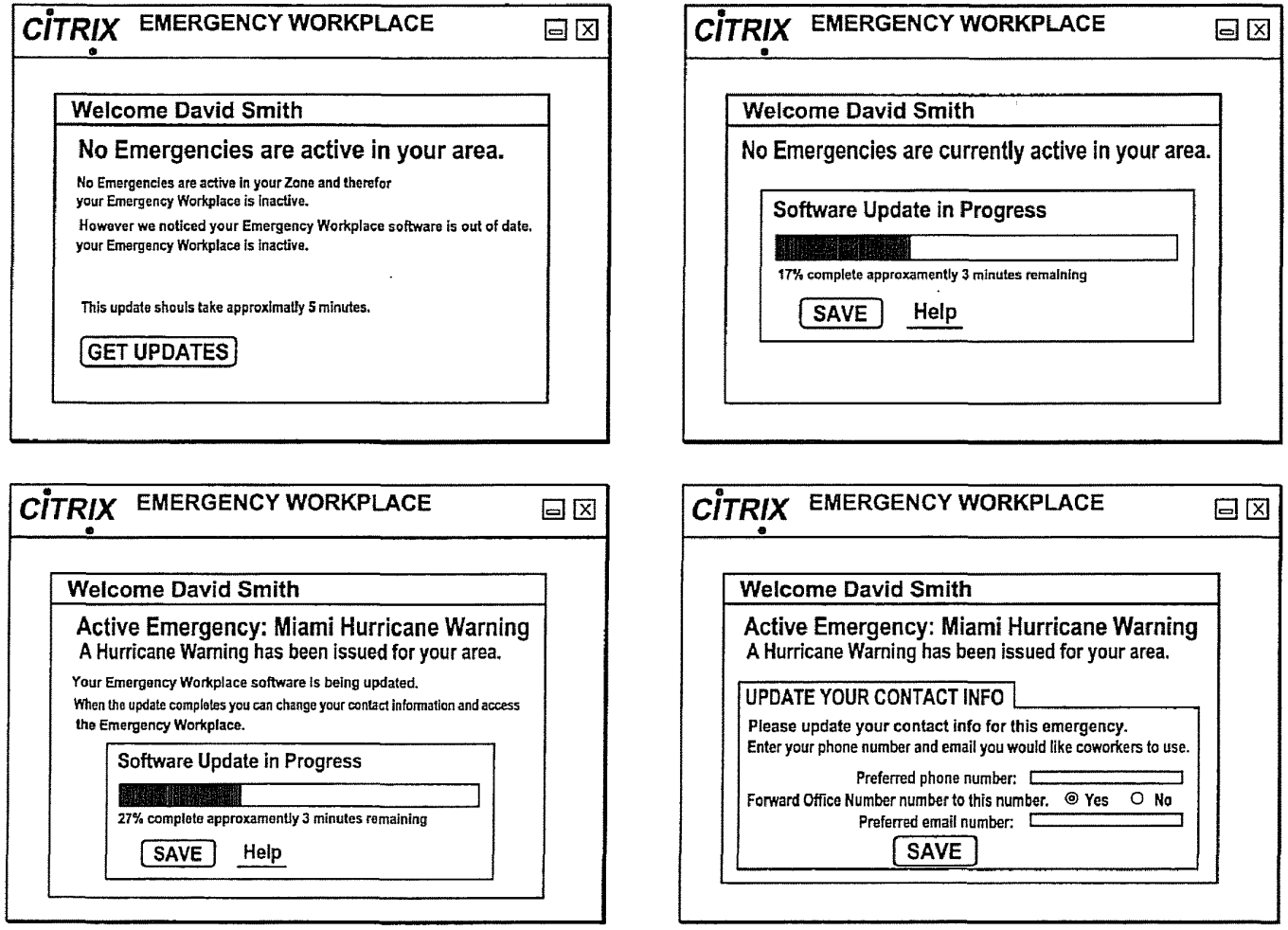
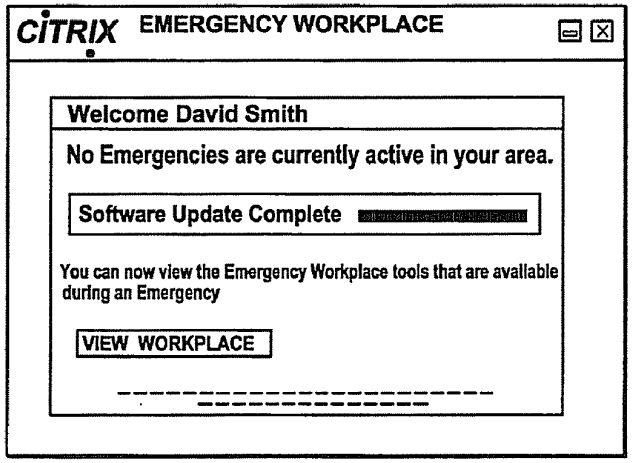
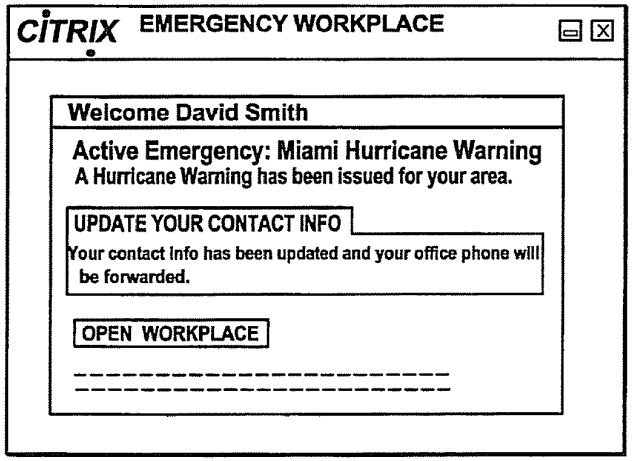

CITRIX EMERGENCY WORKPLACE
Welcome David Smith
No Emergencies are active in your area.
No Emergencies are active in your Zone and therefor your Emergency Workplace is inactive.
However we noticed your Emergency Workplace software is out of date. your Emergency Workplace is inactive.
This update shouls take approximatly 5 minutes.
GET UPDATES
CITRIX EMERGENCY WORKPLACE
Welcome David Smith
No Emergencies are currently active in your area.
Software Update in Progress
17% complete approxamently 3 minutes remaining
SAVE
Help
CITRIX EMERGENCY WORKPLACE
Welcome David Smith
Active Emergency: Miami Hurricane Warning
A Hurricane Warning has been issued for your area.
Your Emergency Workplace software is being updated.
When the update completes you can change your contact information and access the Emergency Workplace.
Software Update in Progress
27% complete approxamently 3 minutes remaining
SAVE
Help
CITRIX EMERGENCY WORKPLACE
Welcome David Smith
Active Emergency: Miami Hurricane Warning
A Hurricane Warning has been issued for your area.
UPDATE YOUR CONTACT INFO
Please update your contact info for this emergency.
Enter your phone number and email you would like coworkers to use.
Preferred phone number:
Forward Office Number number to this number. Yes No
Preferred email number:
SAVE

FIG.6C


CITRIX EMERGENCY WORKPLACE
Welcome David Smith
No Emergencies are currently active in your area.
Software Update Complete
You can now view the Emergency Workplace tools that are available during an Emergency
VIEW WORKPLACE


CITRIX EMERGENCY WORKPLACE
Welcome David Smith
Active Emergency: Miami Hurricane Warning
A Hurricane Warning has been issued for your area.
UPDATE YOUR CONTACT INFO
Your contact info has been updated and your office phone will be forwarded.
OPEN WORKPLACE

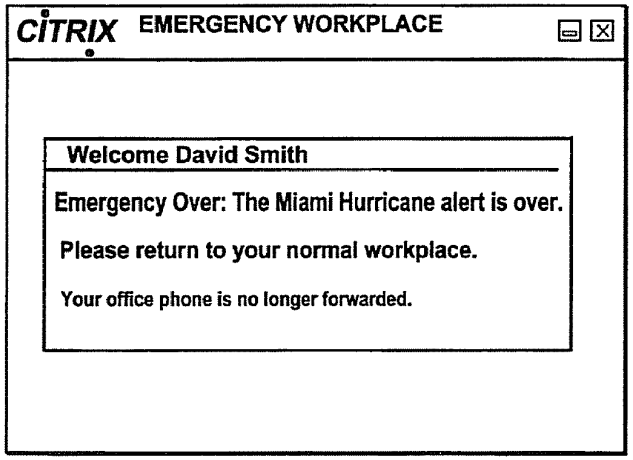
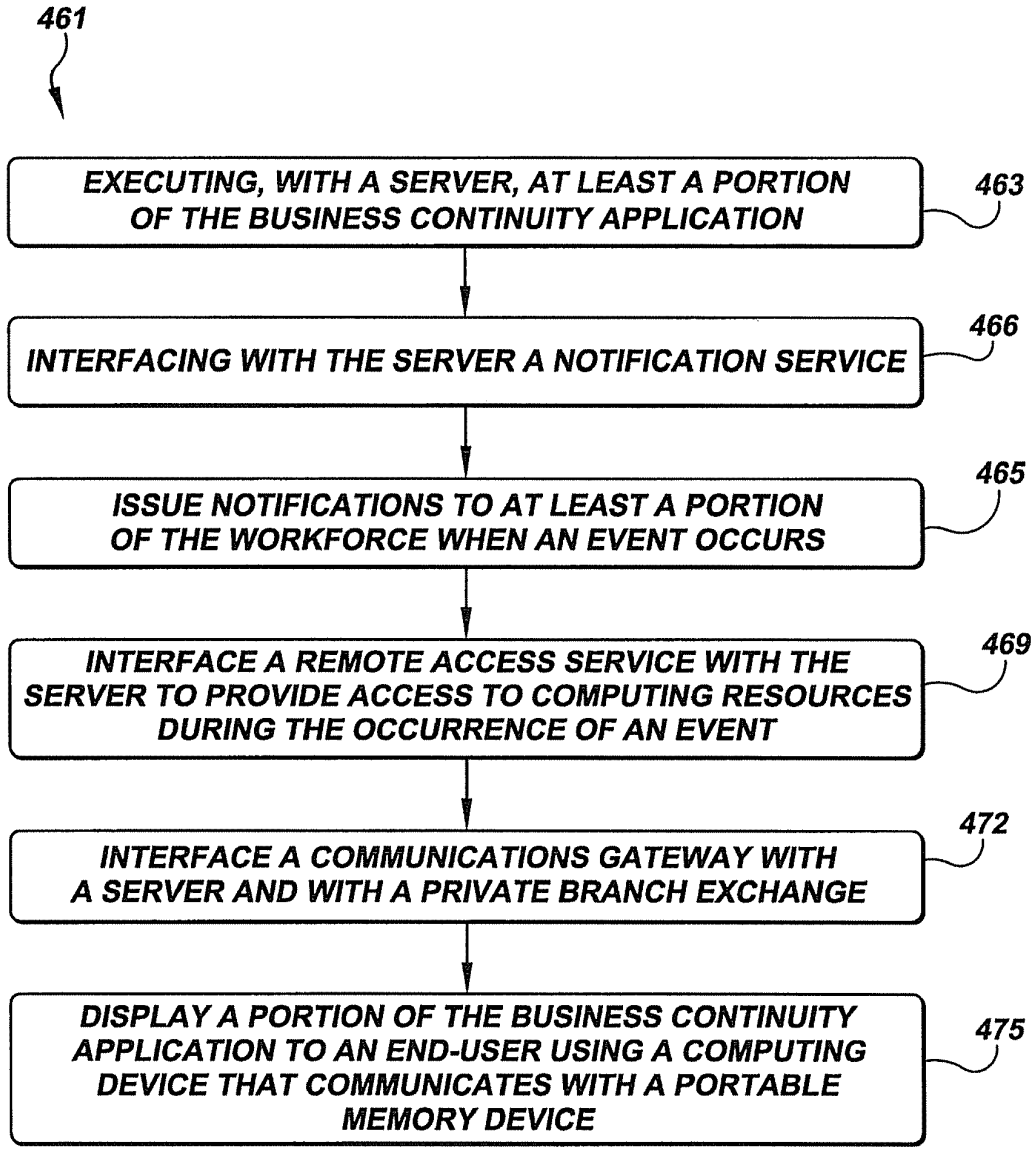

CITRIX EMERGENCY WORKPLACE
Welcome David Smith
Emergency Over: The Miami Hurricane alert is over.
Please return to your normal workplace.
Your office phone is no longer forwarded.

FIG.7


461
EXECUTING, WITH A SERVER, AT LEAST A PORTION OF THE BUSINESS CONTINUITY APPLICATION
463
INTERFACING WITH THE SERVER A NOTIFICATION SERVICE
466
ISSUE NOTIFICATIONS TO AT LEAST A PORTION OF THE WORKFORCE WHEN AN EVENT OCCURS
465
INTERFACE A REMOTE ACCESS SERVICE WITH THE SERVER TO PROVIDE ACCESS TO COMPUTING RESOURCES DURING THE OCCURRENCE OF AN EVENT
469
INTERFACE A COMMUNICATIONS GATEWAY WITH A SERVER AND WITH A PRIVATE BRANCH EXCHANGE
472
DISPLAY A PORTION OF THE BUSINESS CONTINUITY APPLICATION TO AN END-USER USING A COMPUTING DEVICE THAT COMMUNICATES WITH A PORTABLE MEMORY DEVICE
475

SYSTEMS AND METHODS FOR RESPONDING TO THE OCCURRENCE OF AN EVENT

[0001] This application claims priority to U.S. Provisional Patent Application No. 60/862,365, entitled "Systems and Methods for Providing a Business Continuity Service," filed Oct. 20, 2006. The entire contents of the aforementioned application are hereby incorporated by reference.

FIELD OF THE INVENTION

[0002] The present application relates to business applications. In particular, the present application relates to systems and methods for providing a business application that provides business continuity for a workforce.

BACKGROUND OF THE INVENTION

[0003] Some business continuity applications include applications that provide methods and systems for contacting large groups of people at pre-determined, and emergency phone numbers. Other business continuity applications allow displaced workforces to congregate in a single virtual location, and communicate with each other at this location. These continuity applications are provided in part to deal with a dispersed workforce, and in part to deal with, at times, emergency situations. Many business continuity applications provide a method for facilitating communication amongst a workforce.

SUMMARY OF THE INVENTION

[0004] In one aspect, a method of providing a business continuity application to a portion of a displaced workforce, is shown and described. The workforce is a workforce in an organization, and the business continuity application is provided in response to the occurrence of an event. The method includes providing a server computing device that is located in a data center. Executing on the server is at least a portion of the business continuity application, which further includes an application for defining a response scenario to the occurrence of the event. A notification service is interfaced with the server computing device, and is further used to issue notifications to at least a portion of the workforce in response to the occurrence of an event. A remote access service is interfaced with the server, and the remote access service is further used to provide access to computing resources associated with the workforce during the occurrence of the event. A communications gateway is interfaced to both a private branch exchange of the workforce and to the server computing device. The communications gateway further provides at least a portion of the business continuity application. A display of a portion of the business continuity application is displayed to an end-user of a computing device after the occurrence of the event. The computing device is in communication with portions of the business continuity application.

[0005] In another embodiment, the method further includes providing a business continuity application via an application streaming service or application.

[0006] Still another embodiment includes providing a business continuity application via a remote display protocol.

[0007] One embodiment includes providing the business continuity as a service.

[0008] An embodiment can include issuing a notification to at least a portion of the workforce further by placing a call to a number designated by a caller so that communications can be established between a first endpoint and a second endpoint. This embodiment further includes receiving feedback information indicative of the failure to establish communication between the first endpoint and the second endpoint, and then redirecting the call to a portion of the notification service. Contact information associated with the caller designated number and indicative of a third endpoint is retrieved from a storage element. A call is then placed to the retrieved contact information to establish communication between the first endpoint and the third endpoint. In another embodiment, the placing a call to a second endpoint includes placing a call to a member of the workforce. Another embodiment includes retrieving contact information that includes an emergency number associated with the member of the workforce. The emergency contact information, in one embodiment, includes an email address associated with the member of the workforce. Other embodiments include placing a call to the retrieved contact information using one of either of the private branch exchange and a public switched telephone network. Still other embodiments include placing a call to the retrieved contact information using a virtual private network.

[0009] In one embodiment, providing access to communication resources includes providing access to information on a client machine using a remote display protocol.

[0010] Another embodiment includes displaying portions of a business continuity application that includes displaying a graphical user interface representative of a status of the occurrence of the event.

[0011] In one embodiment, displaying portions of a business continuity application further comprises displaying a graphical user interface representative of a directory service that accesses information of the workforce.

[0012] Other embodiments include displaying portions of a business continuity application, where a graphical user interface is displayed that establishes and interacts with an audio communications session.

[0013] Embodiments can further include displaying portions of a business continuity application, where a graphical user interface that establishes and interacts with an instant messaging system, is displayed.

[0014] In one embodiment, interfacing with a communications gateway further includes interfacing with a workforce gateway within a workforce continuity system.

[0015] Still other embodiments include interfacing with a workforce gateway that further includes establishing a connection via a network installed between the computing machine and the private branch exchange.

[0016] In another aspect, a graphical user interface that is displayed on a computing device and that provides continuity to an employee of a workforce, is shown and described. The graphical user interface is created by a program stored on a portable memory device, and is created in response to the occurrence of an event. A first portion is included in the graphical user interface, where the first portion displays information related to the status of an event or the occurrence of an event. The first portion further displays information using a first program stored on a portable device associated with an employee of the workforce. A second portion is included within the graphical user interface. This second portion displays a plurality of business tools available to the employee, each business tool being represented as icon and associated

with a computing device providing the respective business tool. A third portion is included within the graphical interface that provides a directory service to the employee. The directory service is further associated with directory information of the workforce. A fourth portion is included within the graphical interface, where this fourth portion displays a list of at least a portion of the employees of the work force and a status related to each of the employees listed. A mechanism is further provided in the fourth portion that establishes at least one of an audio communications session and an instant messaging session.

[0017] In one embodiment, the portable memory device is a universal serial bus device. Other embodiments include a universal serial bus device that further includes a first reported volume that is configured to store data. In this embodiment the stored data includes the program stored on the universal serial bus. Further included in this embodiment is a second volume that is configured to store a bootstrap loader application. In this embodiment, the bootstrap loader application is further configured to update and execute the stored program.

[0018] In one embodiment, the business tools include a remote access application that provides remote access to a server that is in communication with the computing device.

[0019] In another embodiment, the business tools include a remote access application that provides remote access to a second computing device that is in communication with the computing device.

[0020] Still other embodiments include a =directory service that is in further communication with a storage element that is configured to store the contact information of workforce members.

BRIEF DESCRIPTION OF THE DRAWINGS

[0021] The following figures depict illustrative embodiments of the method and system described herein. These figures are intended to illustrate and not limit the method and system described herein.

[0022] FIG. **1**A is a block diagram of an embodiment of a network environment for a deployment of a business continuity and workforce displacement system.

[0023] FIG. **1**B is a block diagram of an embodiment of a data center environment for a deployment of a business continuity and workforce displacement system.

[0024] FIG. **1**C is a flowchart of an embodiment of a method for redirecting voice information during an occurrence.

[0025] FIGS. **1**D and **1**E are block diagrams of embodiments of a computing device.

[0026] FIG. **2**A is a flowchart of an embodiment of an emergency communication forwarding scenario using insertion of a business continuity service in a coverage path.

[0027] FIG. **2**B is a flowchart of an embodiment of an emergency communication forwarding scenario.

[0028] FIG. **2**C is a block diagram of an embodiment of a system to implement a click-to-call communication.

[0029] FIG. **2**D is a block diagram of an embodiment of a system to handle outbound communications.

[0030] FIG. **3**A is a pictorial diagram representing an embodiment of a Universal Serial Bus (USB) device for providing software and services related to business and workforce continuity.

[0031] FIG. **3**B is a flow diagram depicted an embodiment of a method for setting up and provisioning a USB device.

[0032] FIG. **3**C is a flow diagram depicted an embodiment of a method for using a USB device.

[0033] FIG. **4**A is a pictorial diagram representing an embodiment of the type of users of the business and workforce continuity solution described herein.

[0034] FIG. **4**B is a pictorial diagram representing an embodiment of a user workflow architecture.

[0035] FIG. **4**C is a pictorial diagram representing an embodiment of a user interface for creating an emergency scenario.

[0036] FIG. **4**D is a pictorial diagram representing an embodiment of a user interface for a manager to approve an emergency scenario.

[0037] FIG. **4**E is a pictorial diagram representing an embodiment of a USB device or stick for a user to use in case of emergency.

[0038] FIG. **4**F is a pictorial diagram representing an embodiment of a user interface for testing an emergency scenario.

[0039] FIG. **4**G is a pictorial diagram representing an embodiment of a user interface for activating an emergency.

[0040] FIG. **4**H is a pictorial diagram representing an embodiment of a user interface for notification of an employee or user.

[0041] FIG. **4**I is a pictorial diagram representing an embodiment of a user interface providing an employee communication center.

[0042] FIG. **4**J is a pictorial diagram representing an embodiment of a user interface providing information for a roll call.

[0043] FIG. **4**K is a pictorial diagram representing an embodiment of a user interface providing an employee workplace.

[0044] FIG. **4**L is a pictorial diagram representing an embodiment of a user interface allowing users to collaborate for resources.

[0045] FIG. **4**M is a pictorial diagram representing an embodiment of a user interface allowing users to communicate with peers.

[0046] FIG. **4**N is a pictorial diagram representing an embodiment of a user interface allowing users to access a computing environment providing access to applications and data.

[0047] FIG. **5**A is a pictorial diagram representing embodiments of user interfaces for the user's side bar.

[0048] FIG. **5**B is a pictorial diagram representing other embodiments of user interfaces for the user's side bar.

[0049] FIG. **5**C is a pictorial diagram representing other embodiments of user interfaces for the user's side bar.

[0050] FIG. **6**A is a pictorial diagram representing embodiments of user interfaces for startup screens for the USB device.

[0051] FIG. **6**B is a pictorial diagram representing other embodiments of user interfaces for startup screens for the USB device.

[0052] FIG. **6**C is a pictorial diagram representing additional embodiments of user interfaces for startup screens for the USB device.

[0053] FIG. **7** is a flowchart of an embodiment of a method of providing a business continuity application.

DETAILED DESCRIPTION OF THE DRAWINGS

[0054] Illustrated in FIG. **1**A is an embodiment of a system **193** for providing business and workforce continuity services

and methods. Included within this system is a computing device **100** that communicates with a workforce continuity (WFC) server **194** via a network **104**, and a WFC gateway **192**. Also included is a telecommunications device **100'** in communication with a public branch exchange (PBX) **186**, where the PBX **186** is further in communication with a second communication device **182**. A short messaging service (SMS) or short messaging system **184** is included as are the following system components: a computer telephone integration device or software (CTI) **188**; a remote access and computer remote control software or service **183**; a communication server (LCS server) **196**; one or more databases **185**; and a media gateway **198**.

[0055] Further referring to FIG. **1**A in more detail, in one embodiment of the system **193**, a computing device **100** is included. Embodiments of the computing device **100**, can be any of the below described embodiments of a computing device **100**. Other embodiments of the system **193** include a telecommunications device **100'** that is a cell-phone. Still other embodiments of the telecommunications device **100'** include a telecommunications device **100'** that can be any one of the following devices: a handheld computing machine; a computing device that includes the Microsoft Office Communicator;

[0056] In another embodiment of the system **193**, a network **104** can include any one of the following networks: a local area network; a wide area network; a point to point network; a broadcast network; a telecommunications network; a data communication network; a computer network; an ATM (Asynchronous Transfer Mode) network; a SONET (Synchronous Optical Network) network; a SDH (Synchronous Digital Hierarchy) network; a wireless network; a wireline network; or any other network able to accomplish the systems and methods described herein. Still other embodiments include a network **104** that can be any of the networks described herein.

[0057] The workforce continuity gateway (WFC gateway) **192**, in some embodiments of the system **193**, provides access to the workforce continuity server (WFC server) **194**. In one embodiment of the system **193**, the WFC gateway **192** includes any type and form of gateway, device, appliance or interface unit able to provide access to the WFC server **194**. Another embodiment of the system **193** includes a WFC gateway **192** that provides any one of the following connections to the computing device **100**: a virtual private network (VPN) connection; a Secure Socket Layer (SSL) VPN; an IPsec based VPN connection; or any other connection that can be established over the network **104**. Still other embodiments of the system **193** include a WFC gateway **192** that provides any of the following service, functionalities, or services: SSL VPN connectivity; switching/load balancing; Domain Name Service resolution; acceleration and an application firewall for communications between one or more clients and one or more servers; compression acceleration; decompression acceleration; Transmission Control Protocol pooling; Transmission Control Protocol multiplexing; Transmission Control Protocol buffering; caching; LAN acceleration; or WAN acceleration. In one embodiment of the system **193**, the WFC gateway **192** comprises any of the following: gateways or appliances manufactured by Citrix Systems, Inc.; a Citrix Access Gateway, Standard Edition; a Citrix Access Gateway Advanced Edition; a Citrix Access Gateway Enterprise Edition; a Citrix Application Firewall functionality or device; a Citrix NETscaler appliance; or a Citrix WANscaler appliance.

[0058] The WFC server **194** comprises any type of server, appliance, or computing device for providing any portion of the services, functionality, operation, logic and/or integration of the business and workforce continuity services and functionality described herein. In one embodiment, the WFC server **194** can include any of the following: a web server; an HTTP (HyperText Transfer Protocol) server; a device that provides a web based user interface for accessing the functionality and operations of the services described herein; a portal web-site or service; one or more applications, programs, libraries, services, processes, tasks or set of executable instructions providing the logic, functionality and operations of the business and workforce continuity services described herein; or any type of workflow or logic engine for handling operations of the system. Another embodiment includes a WFC server **194** that includes any type and form of application delivery system. In this embodiment, the application delivery system can include any portion of the Citrix Access Suite™ by Citrix Systems, Inc., such as the MetaFrame or Citrix Presentation Server™ and/or any of the Microsoft® Windows Terminal Services manufactured by the Microsoft Corporation. In one embodiment, the WFC server **194** may deliver one or more applications to one or more users via a remote-display protocol or other protocol that enables remote-based or server-based computing. In another embodiment, the WFC server **194** may deliver one or more applications to clients or users via streaming of the application.

[0059] In one embodiment, the WFC gateway **192** and/or WFC server **194** includes a policy engine for controlling and managing the access to, selection of application execution methods and the delivery of applications. In some embodiments, the policy engine determines the one or more applications a user or client may access. In another embodiment, the policy engine determines how the application should be delivered to the user or client, e.g., the method of execution. In some embodiments, the application delivery system provides a plurality of delivery techniques from which to select a method of application execution, such as a server-based computing, streaming or delivering the application locally to a client for local execution.

[0060] In embodiment, the WFC server **194** may interface, comprise or otherwise use one or more databases **185** to store configuration, data or information. Embodiments can include a database **185** that is any of the following database types or forms: an SQL Server manufactured by the Microsoft Corporation; an Access Database manufactured by Microsoft Corporation; an Oracle database manufactured by Oracle Corporation; an object database; a database that includes a file system or one or more files; or other database type or form able to interface with the WFC server **194**. Other embodiments include a database **185** that stores information or data identifying contact information and methods of communication for one or more users of the workforce continuity server **194**. Still other embodiments utilize a file or other data item that interfaces with the WFC server **194** and stores information.

[0061] Embodiments can include a communication server **196** that provides one or more types of communication services via email, SMS, instant messaging (IM), Voice over Internet Protocol (VoIP) or any other form of telecommunications and communication mediums and means. In one

embodiment, the communication server **196** comprises Live Communications Server manufactured by the Microsoft Corporation. In this embodiment, the communication server **196** provides tools necessary to connect users to public instant messaging (IM) Internet service providers, such as MSN, AOL, and Yahoo!. Using Microsoft Office Communicator, the Live Communications Server enabled users who are licensed for public IM connectivity, can add contacts, send instant messages, and share presence information with users of MSN Messenger, AOL Instant Messenger (AIM) and Yahoo! Messenger. In one embodiment, the computing device **100** or telecommunication device **100'** comprises the Microsoft Office Communicator. Further embodiments include a communication server **196** that provides any of the following services and capabilities: searching for contacts easily using an Address Book Service; integrating with Microsoft Office Outlook and Microsoft Exchange Server to let users view other contacts' free/busy information from their schedule, as well as display their 'Out of Office' messages directly in Microsoft Office Communicator; extending presence, including the ability to allow users to set 'custom notes', to provide more rich information to other contacts, enabling them to make more informed decisions on how to interact; and controlling enterprise phones directly from a computing device **100**. With the appropriate private branch exchange (PBX) or public switched telephone network (PSTN) gateway infrastructure in place, Microsoft Office Communicator provides integration with enterprise telephony systems, allowing the user to initiate calls and even divert calls to a remote location when they are not at their desk. In other embodiments, the communication server **196** can initiate conference calls with partner service providers directly from Microsoft Office Communicator.

[0062] The media gateway **198** includes any type and form of server, gateway, device or appliance for communicating, translating or interfacing between disparate telecommunications networks. In one embodiment, a media gateway provides an interface between a first type of telecommunication network and a second type of telecommunication network. In another embodiment, a media gateway provides an interface between a first type of telecommunication protocol and a second type of telecommunication. In some embodiments, the media gateway converts between the different transmission and coding techniques of the telecommunication networks. In one embodiment, the media gateway includes a Voice over Internet Protocol (VoIP) media gateway. In some embodiments, the media gateway performs the conversion between Time Division Multiplexing (TDM) voice to VoIP. In yet another embodiment, the media gateway includes a signaling gateway. In some embodiments, a Signaling Gateway is a network component for translating signaling messages (e.g.,. information about call establishment and teardown) between one medium (e.g., Internet Protocol and another (PSTN). For example, a signaling gateway might translate between ISUP (ISDN User Part) and Session Initiation Protocol (SIP). In one embodiment, the media gateway may include a SMS gateway.

[0063] In one embodiment, the gateway **192**, WFC server **196** or media gateway provides or supports the provision of IP telephony services and applications to a telecommunication device **100**. In some embodiments, the gateway **200** includes Voice Office Applications having a set of one or more telephony applications. In one embodiment, the Voice Office Applications include the Citrix Voice Office Application suite of telephony applications. The gateway **192**, WFC server **196** or media gateway may trans-code, transform or otherwise process user interface content to display in the form factor of the display of the telecommunication device **100**.

[0064] The computer telephony integration (CTI) **188** includes software, hardware or any combination of software and hardware that provides a link between telephone systems and computers to facilitate incoming and outgoing call handling and control. In one embodiment, the CTI includes a physical link between a telephone and server. In some embodiments, CTI is a technique by which computers control telephony systems such as PBXs, for example, a call center where calls are queued up and routed to agents based on criteria such as caller ID and called number.

[0065] The PBX **186** can include any type and form of private branch exchange. In some embodiments, a PBX **186** includes a private voice-communications-capable switching facility located in a entity's premises which provides on-premises connection between terminals connected to it, including dial service, and may provide connections to between those terminals and other communications networks, including a PSTN. Other embodiments include a business workforce continuity management system the works with any of the following types of PBX system: any model and/or type of PBX system manufactured by Avaya, Cisco, Nortel, MyTel, or Semmins; or any other type of PBX system that includes voice mail.

[0066] The telephone **182** may include any type and form of telecommunication device. The telephone **182** can include any of the following: a phone including both software and hardware; an analog phone; a digital telephone; a voice-over-IP (VoIP) device for communicating voice data over internet protocol communications; a Cisco IP Phone manufactured by Cisco Systems, Inc; a Nortel IP Phone manufactured by Nortel Networks; any of the family of Avaya IP Phones manufactured by Avaya, Inc.; a phone that can support any type and form of protocol, including any real-time data protocol, Session Initiation Protocol (SIP), or any protocol related to IP telephony signaling or the transmission of media, such as voice, audio or data via a network **104**; a phone that includes any type and form of user interface in the support of delivering media, such as video, audio and data; or any other phone that can implement the methods and systems described herein.

[0067] In one embodiment, the application delivery system **183** can be any one of the following types of systems: GoToMyPC; Citrix Presentation Server; Citrix Desktop Server; Citrix Tarpon for application streaming; or any other system able to deliver remote applications to a client machine.

[0068] The SMS Messaging **184** includes software, hardware or any combination of software and hardware for transmitting and/or receiving Short Message Service messages. In one embodiment, the SMS messaging **184** includes a service, gateway or interface for communicating SMS messages from one type of telecommunication form or network to a device capable of sending and/or receiving SMS. In some embodiments, the SMS messaging may be deployed on any type and form of device, gateway, server or appliance, including the WFC server **194**, WFC gateway or Media gateway **198**.

[0069] In one embodiment, the system may include multiple, logically-grouped servers In these embodiments, the logical group of servers may be referred to as a server farm. In some of these embodiments, the serves may be geographically dispersed. In some cases, a farm may be administered as

a single entity. For example, any of the WFC gateway **192**, WFC server **194**, LCS server **196**, database **185**, and/or media gateway may be deployed as a server farm. In other embodiments, the server farm includes a plurality of server farms. In one embodiment, the server farm executes one or more applications on behalf of one or more clients. The servers within each farm can be heterogeneous. One or more of the servers can operate according to one type of operating system platform (i.e. Windows XP), while one or more of the other servers **106** can operate on according to another type of operating system platform (i.e., Unix or Linux). The servers of each farm do not need to be physically proximate to another server in the same farm **38**. Thus, the group of servers logically grouped as a farm may be interconnected using a wide-area network (WAN) connection or medium-area network (MAN) connection. For example, a farm may include servers **106** physically located in different continents or different regions of a continent, country, state, city, campus, or room. Data transmission speeds between servers in the farm can be increased if the servers are connected using a local-area network (LAN) connection or some form of direct connection.

[0070] In one embodiment, any combination of an OpenSER, a STUN server, and a TURN server is used in lieu of the LCS server **196**. A STUN server, in this embodiment, utilizes a STUN protocol that routes packets that transferred between devices installed behind a network address translation (NAT) firewall. The STUN (simple transversal of UDP through NATS) protocol can be installed on a computing machine to further create a STUN server that allows devices that communication over a network **104** to find their IP addresses, and further determine the type of NAT service a requesting device is sitting behind. STUN servers, in this embodiment, further accept STUN requests and return STUN responses. In this embodiment, OpenSER is a source SIP server that can provide any of the following services: load balancing; registrar; location server; proxy server; redirect server; or a VoIP application server. In this embodiment, OpenSER is used to provide VoIP for call redirection within the WFC system **160**. A TURN (traversal using relay NAT) server is a computing machine configured to transfer data using the TURN protocol. The TURN protocol, in one embodiment, provides devices communicating via the network **104**, to transmit and receive data over TCP or UDP connections. In this embodiment, the devices are located behind a NAT or firewall. The TURN server, in this embodiment, relays information between devices using the TURN protocol.

[0071] Although FIG. **1**A shows a network **104** between the devices **100** and the gateway **192**, the devices **100**, **100'** and/or the WFC gateway **192** may be on the same network **104** or on different networks **104** and **104'**. The networks **104**, **104'** can be the same type of network or different types of networks. The network **104** and/or the network **104'** can be a local-area network (LAN), such as a company Intranet, a metropolitan area network (MAN), or a wide area network (WAN). In one embodiment, network **104'** may be a private network and network **104** may be a public network. In some embodiments, the main network **104** may be a private network and the sub-network **104'** a public network. In another embodiment, both the main network **104** and the sub-network **104'** are private networks. In some embodiments, clients **102** may be located at a branch office of a corporate enterprise communicating via a WAN connection over the network **104** to the servers **106** located at a corporate data center. In one embodiment, the network **104** and/or sub-network **104'** can be any type and/or form of network and may include any of the following: a point to point network, a broadcast network, a wide area network, a local area network, a telecommunications network, a data communication network, a computer network, an ATM (Asynchronous Transfer Mode) network, a SONET (Synchronous Optical Network) network, a SDH (Synchronous Digital Hierarchy) network, a wireless network and a wire-line network. In some embodiments, the network **104** may include a wireless link, such as an infrared channel or satellite band. The topology of the network **104** and/or **104'** may be a bus, star, or ring network topology. The network **104** and/or **104'** and network topology may be of any such network or network topology as known to those ordinarily skilled in the art capable of supporting the operations described herein.

[0072] In one embodiment, the business workforce continuity system can be deployed as a Software-as-a-Service (SaaS) model. In this embodiment, any portion of the functionality, operation or logic of the business workforce continuity system can be provided via a hosted application model that is accessed by one or more users via a web-page or portal. When deploying the business workforce continuity system as a service, the software stack of the relational database management system, operating system and application are designed for multi-tenancy, meaning that the system can host more than one workforce members at the same time. The SaaS delivery model of the business workforce continuity system, in one embodiment, may provide any of the following services or abilities: ability to configuration notifications; ability to configure emergency scenarios; ability to configure work flows; ability to provide surveys, message boards, and status; ability to allow users to generate and add content to the business workforce continuity system; ability to dynamically identify types and locations of emergency resources; and further provide voice and remote-computer-access via applications such as GoToMyPC, an application distributed by Citrix Online. In other embodiments, the business workforce continuity system can be streamed from a server to a client and published within an isolation environment. Still other embodiments include providing the business workforce continuity system via any other application streaming system. In one embodiment, the business workforce continuity system can be provided via any of the following application delivery techniques offered by Citrix: Citrix NetScaler; Citrix Presentation Server; and Citrix Desktop Server.

[0073] Illustrated in FIG. **1**B is an embodiment of a workforce continuity system **160** that includes a license manager **1003**, a set of telephony services **1006**, a local file system **1009**, a communication gateway web administration module **1012**, and database web services **1015**. In communication with the workforce continuity system **160** is a license server, a computing machine operated by a user, a private branch exchange, an administrative computing machine, and the central web service.

[0074] Further referring to FIG. **1**B, and in more detail. Those devices in communication with the workforce continuity management system **160**, can in some embodiments, include additional devices such as: additional computing machines; additional administrative computing devices; or any other device required to provide business continuity to a workforce. The public branch exchange is, in this embodiment, used to receive workforce-member initiated calls, and further redirect calls to emergency numbers and alternative

extensions. A user accesses the workforce continuity system via a computing device. In this embodiment, the computing device can be used to perform click-to-call requests. A license server is further used to route

[0075] In this embodiment, a license manager **1003** is included within the workforce continuity system **160**. The license manager **1003**, in this embodiment, communicates with the license server and performs checks with the license server to control individual features of the workforce continuity system **160**. In some embodiments, the license manager **1003** can perform end-user authentication based on supplied domain user credentials. The license manager **1003**, in this embodiment, issues handles to the requests issued from authenticated end-users.

[0076] In one embodiment, the workforce continuity system **160** includes a group of telephone services **1006** that include: a call director; a click-to-call web service; a communications server; a telephony server; an asterisk gateway interface installed between the telephony server and the communications server; and an asterisk manager installed between the telephony server and the communications server. The click-to-call web service is a service that provides authentication of the click-to-call requests received by the workforce continuity system **160** and further retrieves an end-user's extension or a an emergency number using directory information stored within a storage element included in the workforce continuity system **160**. Other embodiments include a click-to-call service that uses a token or login credential to authenticate the end-user, or a license handle that is supplied with the request and that performs the authentication. A communications server is included within the telephony services **1006**, and is used to interface with the telephony server, where the telephony server is used to integrate with different customer PBXs via one or more QSIG, or SIP trunks. In one embodiment, the telephony server is based on the ASTERISK PBX software distributed by Digium, Inc. Asterisk is a complete IP PBX in software, and runs on any of the following operating systems: Linux, Mac OS, OpenBSD, FreeBSD, and Sun Solaris, or any other operating system able to carry out the methods and systems described herein. Communication between the communications server and the telephony server is further enabled by an Asterisk Gateway Interface, and an Asterisk Manager, where both are provided by the Asterisk PBX software. In this embodiment, the Asterisk Gateway Interface provides communication capabilities to the telephony server and the comm. server, while the Asterisk Manager managers communication between the telephony server and the comm. server. In further embodiments, a communication server is provided to aid in forwarding all inbound calls received on the workforce member's PBX extension to a retrieved emergency number specified by the workforce member.

[0077] In one embodiment, a local file system **1009** is further included in the workforce continuity system **160**. The file system **1009**, in this embodiment, the file system **1009** organizes directories and files according to how they will be implemented in the disk operating system. File system types that may be used include: FAT16, FAT32, EAFS, NTFS, HPFS, S51K, Ext2, AFS. The file system can in some embodiments store configuration files, logs, profiles, directories, databases, or additional data. The local file system **1009**, in one embodiment, communicates with the telephony services **1006** and further provides the telephony server within the telephony services **1006** with configuration data that can be utilized to configure the telephony server to interface with the communication server and to interface with the rest of the components included and in communication with the workforce continuity system **160**.

[0078] Other embodiments include a database of web services **1015** that includes a local database, a CDR writer WS, profiles WS, call detail records WS, and an express directory WS. The express directory included in the database web services **1015** and in communication with the local database, provides the ability to traverse more than one directory without having to aggregate the directories. In one embodiment, the express directory receives an instructions from the telephony services **1006** to locate a portion of contact information that is stored in one or more directories. In response to receiving the command, the express directory initiates more than one directory handler routines. In this embodiment, more than one directory handler may be used to handle the each of the different contact information formats. Directory handlers traverse the directories within the local database and locate the requested contact information. When more than one directory contains the same contact information, the duplicate contact information is removed so that only one directory contains the contact information. Once retrieved, the contact information is returned to the requesting workforce continuity **160** device.

[0079] In one embodiment, a communication gateway web administration module **1012** is included. The administration module **1012** can, in this embodiment, communicates with the license manager **1003**, the local file system **1009**, the telephony services **1006**, and the database web services **1015**. The administration module **1012** can, in this embodiment, use the devices connected to the module **1012** to perform any of the following tasks: access the local file system **1009** and further retrieve, transmit and update files within the local file system **1009**; configure features and aspects of the PBX using the telephony services **1006**; provision the PBX and the workforce continuity system **160**; configure user profiles and network settings using the license server, or access and manipulate the database web services **1015**. The administration module **1012** is further connected to an administration computing device via either a direct or web-based interaction.

[0080] Illustrated in FIG. **1**C, is a method **302** of redirecting a call using the BWC system **160**. A call is first placed, by a caller, and to a caller-designated number (step **303**). When the caller-designated number rings (step **306**), and the call is not picked-up by a receiver (step **309**); the PBX re-directs the call to a trunk (step **312**). The communication server sends a re-directed number lookup request to the central web service (step **315**), and a check is made for an emergency number (step **318**), and if an emergency number is found (step **321**), the workforce gateway transfers the call to the PBX via the trunk (step **324**). When an emergency number is not found, a voice mail extension is provided and a call is placed to that extension so that the caller may be put through to voice mail (step **319**). When an emergency number is found, and the workforce gateway transfers the call to the PBX via a trunk (step **324**), the PBX then dials out the retrieved emergency number (step **327**). When a call is established, the communication server then releases itself from the media path (step **330**).

[0081] Referring to FIG. **1**C in more detail, in one embodiment, a caller places a call to a caller-designated number (step **303**). The caller designated number, in this embodiment, is an extension within the workforce private branch exchange **186**.

Other embodiments include a caller that places a call to a number via a public branch exchange, or an embodiment where the caller places a call to a number within a private branch exchange within a public branch exchange. In one embodiment, the method **302** includes placing a call to an extension which further causes a phone **182** to ring. Still further embodiments include placing a call to a toll free number that terminates on the workforce's PBX and then specifying the workforce member's extension after an IVR prompt.

[0082] Embodiments include a caller that can be a client, where a BWC system client can be any of the following: a member of the workforce; a computing machine enabled as a client when a member of the workforce creates a secure link between the computing machine and the BWC system **160**; or any other computing device able to participate as a user within the BWC system **160**. The client may include one or more client agents that can provide: end point detection and authorization; LAN and application delivery acceleration; WAN acceleration; remote display or server based computing processing; VPN and secure access gateway functionality; or application delivery. The client agent may include any of the client agents manufactured by Citrix Systems, Inc. including but not limited to, any of the client agents for the Access Gateway appliance, NETscaler appliance, Citrix Application Firewall, or WANscaler appliance. The client agent may also include an ICA client that supports the Independent Computing Architecture (ICA) protocol of Citrix Systems, Inc. and as used with the Citrix Presentation Server product embodiments. In another embodiment, the client agent may include any type and form of agent for supporting or providing streaming of one or more applications. Still other embodiments include client agents or software able to provide the following functionality: click-to-call; a SIP phone, an IP phone, or a VoIP phone; instant messaging and presence; BWC system **160** logic; and VPN logic. In some embodiments, any one or more, or all, of these functions or applications may be provided or delivered via a USB device or stick. In other embodiments, any one or more, or all, of these functions or applications may be provided or delivered via download from a web-site, such as a business continuity management (BCM) portal, or from a BCM appliance or WFC gateway. In another embodiment, an appliance, such as the BCM appliance or WFC gateway may automatically deliver the client-side applications or agent, and the computing device may automatically install and/or execute the applications.

[0083] In one embodiment, the extension rings (step **306**), and the call is not "picked up" (step **309**). Other embodiments include using the PBX to transfer the call to a trunk (step **312**) upon placing a call to the caller-determined extension (step **303**). Still other embodiments may include using the PBX to transfer the call to a trunk (step **312**) once it is determined that the extension rings (step **306**). In one other embodiment, when a determination is made that extension has not rung (step **306**), the PBX transfers the call to a trunk (step **312**). The trunk can be either a QSIG physical trunk, or a SIP trunk. The Communication server receives the inbound call setup and extracts the redirecting party's extension.

[0084] In one embodiment the communication server sends a re-directed number lookup request to the central web service (step **315**). The central web service then interacts with the WFC system **160** to find an emergency number (step **318**), and if the emergency phone number is found (step **321**), the workforce gateway transfers the call to the PBX via the a trunk (step **324**). If no emergency number is found, then an empty value is returned and a voice mail extension is provided so that a call may be placed to the voice mail extension to put the caller through to voice mail (step **319**). In one embodiment, the method **302** includes searching for an emergency number that corresponds to the number called by the user. A corresponding number can be determined by using an identifier or flag that corresponds to the user-called number. The trunk to which the retrieved emergency number is sent, can be any of the trunks described herein.

[0085] Once the workforce gateway transfers the call to the PBX using the trunk (step **324**), the PBX dials out to the retrieved emergency number (step **327**). If a call is established, then the user may talk with the user without knowing that the call was forwarded, and the communication server further releases itself from the media path (step **330**). If the call is not established, then in one embodiment, a voice mail extension may be provided and a call is placed to the voice mail extension so that the caller is redirected to a voice mail (step **330**). In one embodiment, when the call is established, the communication server releases itself from the voice path established between the PBX and the workforce gateway. In an embodiment where a QSIG trunk is used, the communication server will release itself by issuing a path replacement additional network feature that causes the PBX to send a facility message on one of the call legs, which the communications server re-broadcasts to the other call leg. The PBX then sends an ISDN release to both call legs and bridges the talk path between the caller and the PBX user locally to remove the communication server from the signaling path. IN another embodiment where a SIP trunk is used, the communication server and the PBX server issue SIP invites to the outbound call legs advertising media ports of the incoming calls. In this embodiment, after the outgoing PBX call leg answers the call with a SIP OK response, the communication then sends a SIP re-invite to the incoming call leg and advertises the media port of the outbound call leg. Further, when this occurs in this embodiment, the resulting connection will include signaling legs that are controlled by the communication server for the duration of the call, but the call information will be sent between the two IP PBX ports, removing the communication server from the media path but not releasing the communication server entirely.

[0086] The servers, gateway, database, computer and telecommunication, software and services and any other item or method depicted in FIGS. **1A-1C** may be deployed as and/or executed on any type and form of computing device, such as a computer, network device or appliance capable of communicating on any type and form of network and performing the operations described herein. FIGS. **1D** and **1E** depict block diagrams of a computing device **100**. As shown in FIGS. **1D** and **1E**, each computing device **100** includes a central processing unit **101**, and a main memory unit **122**. As shown in FIG. **1D**, a computing device **100** may include a visual display device **124**, a keyboard **126** and/or a pointing device **127**, such as a mouse. Each computing device **100** may also include additional optional elements, such as one or more input/output devices **130***a*-**130***b* (generally referred to using reference numeral **130**), and a cache memory **140** in communication with the central processing unit **101**.

[0087] The central processing unit **101** is any logic circuitry that responds to and processes instructions fetched from the main memory unit **122**. In many embodiments, the central

processing unit is provided by a microprocessor unit, a single core processor, a dual core processor, or a processor with more than two cores. Other embodiments of the computing device **100** include a processor that is able to carry out the methods and systems described herein.

[0088] Main memory unit **122** may be one or more memory chips capable of storing data and allowing any storage location to be directly accessed by the microprocessor **101**, such as Static random access memory (SRAM), Burst SRAM or SynchBurst SRAM (BSRAM), Dynamic random access memory (DRAM), Fast Page Mode DRAM (FPM DRAM), Enhanced DRAM (EDRAM), Extended Data Output RAM (EDO RAM), Extended Data Output DRAM (EDO DRAM), Burst Extended Data Output DRAM (BEDO DRAM), Enhanced DRAM (EDRAM), synchronous DRAM (SDRAM), JEDEC SRAM, PC100 SDRAM, Double Data Rate SDRAM (DDR SDRAM), Enhanced SDRAM (ESDRAM), SyncLink DRAM (SLDRAM), Direct Rambus DRAM (DRDRAM), or Ferroelectric RAM (FRAM). The main memory **122** may be based on any of the above described memory chips, or any other available memory chips capable of operating as described herein. In the embodiment shown in FIG. **1**D, the processor **101** communicates with main memory **122** via a system bus **150** (described in more detail below). FIG. **1**D depicts an embodiment of a computing device **100** in which the processor communicates directly with main memory **122** via a memory port **103**. For example, in FIG. **1**E the main memory **122** may be DRDRAM.

[0089] FIG. **1**E depicts an embodiment in which the main processor **101** communicates directly with cache memory **140** via a secondary bus, sometimes referred to as a backside bus. In other embodiments, the main processor **101** communicates with cache memory **140** using the system bus **150**. Cache memory **140** typically has a faster response time than main memory **122** and is typically provided by SRAM, BSRAM, or EDRAM. In the embodiment shown in FIG. **1**D, the processor **101** communicates with various I/O devices **130** via a local system bus **150**. Various busses may be used to connect the central processing unit **101** to any of the I/O devices **130**, including a VESA VL bus, an ISA bus, an EISA bus, a MicroChannel Architecture (MCA) bus, a PCI bus, a PCI-X bus, a PCI-Express bus, or a NuBus. For embodiments in which the I/O device is a video display **124**, the processor **101** may use an Advanced Graphics Port (AGP) to communicate with the display **124**. FIG. **1**E depicts an embodiment of a computer **100** in which the main processor **101** communicates directly with I/O device **130** via HyperTransport, Rapid I/O, or InfiniBand. FIG. **1**E also depicts an embodiment in which local busses and direct communication are mixed: the processor **101** communicates with I/O device **130** using a local interconnect bus while communicating with I/O device **130** directly.

[0090] The computing device **100** may support any suitable installation device **116**, such as a floppy disk drive for receiving floppy disks such as 3.5-inch, 5.25-inch disks or ZIP disks, a CD-ROM drive, a CD-R/RW drive, a DVD-ROM drive, tape drives of various formats, USB device, hard-drive or any other device suitable for installing software and programs such as any business and workforce continuity software **120**, or portion thereof. The computing device **100** may further comprise a storage device **128**, such as one or more hard disk drives or redundant arrays of independent disks, for storing an operating system and other related software, and for storing application software programs such as any program related to the of business and workforce continuity software **120**. Optionally, any of the installation devices **116** could also be used as the storage device **128**. Additionally, the operating system and the software can be run from a bootable medium, for example, a bootable CD, such as KNOPPIX®, a bootable CD for GNU/Linux that is available as a GNU/Linux distribution from knoppix.net.

[0091] Furthermore, the computing device **100** may include a network interface **118** to interface to a Local Area Network (LAN), Wide Area Network (WAN) or the Internet through a variety of connections including, but not limited to, standard telephone lines, LAN or WAN links (e.g., 802.11, T1, T3, 56 kb, X.25), broadband connections (e.g., ISDN, Frame Relay, ATM), wireless connections, or some combination of any or all of the above. The network interface **118** may comprise a built-in network adapter, network interface card, PCMCIA network card, card bus network adapter, wireless network adapter, USB network adapter, modem or any other device suitable for interfacing the computing device **100** to any type of network capable of communication and performing the operations described herein.

[0092] A wide variety of I/O devices **130***a*-**130***n* may be present in the computing device **100**. Input devices include keyboards, mice, trackpads, trackballs, microphones, and drawing tablets. Output devices include video displays, speakers, inkjet printers, laser printers, and dye-sublimation printers. The I/O devices **130** may be controlled by an I/O controller **123** as shown in FIG. **1**D. The I/O controller may control one or more I/O devices such as a keyboard **126** and a pointing device **127**, e.g., a mouse or optical pen. Furthermore, an I/O device may also provide storage **128** and/or an installation medium **116** for the computing device **100**. In still other embodiments, the computing device **100** may provide USB connections to receive handheld USB storage devices.

[0093] In some embodiments, the computing device **100** may comprise or be connected to multiple display devices **124***a*-**124***n*, which each may be of the same or different type and/or form. As such, any of the I/O devices **130***a*-**130***n* and/or the I/O controller **123** may comprise any type and/or form of suitable hardware, software, or combination of hardware and software to support, enable or provide for the connection and use of multiple display devices **124***a*-**124***n* by the computing device **100**. For example, the computing device **100** may include any type and/or form of video adapter, video card, driver, and/or library to interface, communicate, connect or otherwise use the display devices **124***a*-**124***n*. In one embodiment, a video adapter may comprise multiple connectors to interface to multiple display devices **124***a*-**124***n*. In other embodiments, the computing device **100** may include multiple video adapters, with each video adapter connected to one or more of the display devices **124***a*-**124***n*. In some embodiments, any portion of the operating system of the computing device **100** may be configured for using multiple displays **124***a*-**124***n*. In other embodiments, one or more of the display devices **124***a*-**124***n* may be provided by one or more other computing devices, such as computing devices **100***a* and **100***b* connected to the computing device **100**, for example, via a network. These embodiments may include any type of software designed and constructed to use another computer's display device as a second display device **124***a* for the computing device **100**. One ordinarily skilled in the art will recognize and appreciate the various ways and embodi-

ments that a computing device **100** may be configured to have multiple display devices **124***a*-**124***n*.

[0094] In further embodiments, an I/O device **130** may be a bridge **170** between the system bus **150** and an external communication bus, such as a USB bus, an Apple Desktop Bus, an RS-232 serial connection, a SCSI bus, a FireWire bus, a FireWire **800** bus, an Ethernet bus, an AppleTalk bus, a Gigabit Ethernet bus, an Asynchronous Transfer Mode bus, a HIPPI bus, a Super HIPPI bus, a SerialPlus bus, a SCI/LAMP bus, a FibreChannel bus, or a Serial Attached small computer system interface bus.

[0095] A computing device **100** of the sort depicted in FIGS. **1**D and **1**E typically operate under the control of operating systems, which control scheduling of tasks and access to system resources. The computing device **100** can be running any operating system such as any of the versions of the Microsoft® Windows operating systems, the different releases of the Unix and Linux operating systems, any version of the Mac OS® for Macintosh computers, any embedded operating system, any real-time operating system, any open source operating system, any proprietary operating system, any operating systems for mobile computing devices, or any other operating system capable of running on the computing device and performing the operations described herein.

[0096] In other embodiments, the computing device **100** may have different processors, operating systems, and input devices consistent with the device. For example, in one embodiment the computer **100** is a Treo **180**, **270**, **1060**, **600** or **650** smart phone manufactured by Palm, Inc. In this embodiment, the Treo smart phone is operated under the control of the PalmOS operating system and includes a stylus input device as well as a five-way navigator device. Moreover, the computing device **100** can be any workstation, desktop computer, laptop or notebook computer, server, handheld computer, mobile telephone, any other computer, or other form of computing or telecommunications device that is capable of communication and that has sufficient processor power and memory capacity to perform the operations described herein.

[0097] Illustrated in FIG. **2**A is one embodiment of call forwarding during an emergency, where a call is forwarded using the BWC system **160**. The method **401** includes receiving information indicative that the user called a caller-identified number and received no response (step **402**). The original call is then forwarded to a coverage path (step **404**), and can be further forwarded to the BWC system **160** (step **406**). One branch of the method **401** tries calling the caller-specified number again (step **408**), and making a determination as to whether or not an answer was received (step **410**). If no answer is received, then the call is sent to voice mail (step **412**), and if an answer is received, the call is put through (step **418**). In another branch of the method **401**, emergency contact information is retrieved from the database **185** or other storage element (step **414**), and the call is re-directed to the retrieved emergency contact information (step **416**).

[0098] Further referring to FIG. **2**A in more detail, in one embodiment, information is received by the method **401** indicating whether or not a user was able to call the intended number or extension (step **402**). The received information can be feedback data in the form of an alert sent to the method **401**, or in the form of a logic value indicative of whether or not the call was successful. In one embodiment, the information can indicate whether or not the caller was successful in reaching the intended recipient. In other embodiments, this information can detail the terms of parameters of the call including identification information corresponding to the intended call-recipient, the number called, and identification information corresponding to the caller.

[0099] In one embodiment of the method **401**, the call is forwarded to a coverage path (step **404**). The coverage path can be included in the PBX **186**, and can be configured, modified, defined, designed and constructed to transfer the call to the BWC system **160**. Other embodiments include a coverage path that signals the PBX to redirect extensions called, to TDM lines without user intervention. In this embodiment, and during an emergency situation, if a system user is displaced and a call to that user is not completed, the call can be substantially automatically redirected from the PBX system **186** to emergency contact information. Other embodiments include a coverage path that transfers the call to an external number or service. Still other embodiments may provide a media gateway to translate or interface the call from one type of telecommunication network or protocol to another network or protocol. In other embodiments, the coverage path is adapted to transfer the call to a BWC system appliance or server, such as the WFC gateway or WFC server as depicted in FIG. **1**A.

[0100] The call is redirected to the BWC system **160** (step **406**), in one embodiment, where the call is further sent along one of two branches within the method **401**. In one embodiment, the call can be attempted again (step **408**), and a determination is made as to whether or not the call was answered (step **410**). If the call was not answered, then the call is forwarded to voice-mail (step **412**), and if the call is answered, the call is put through (step **418**). Other embodiments of the method **401** may search for and retrieve emergency contact information when the call is not answered. Still other embodiments may in addition to sending the call to voice-mail (step **412**), send the call to retrieved emergency contact information (step **416**). In one embodiment, the call may not be attempted again, and rather emergency contact information will be retrieved (step **414**), and the call will be forwarded to retrieved emergency contact information (step **416**).

[0101] In one embodiment, emergency contact information is retrieved (step **414**), and the call is re-directed according to the retrieved emergency contact information (step **416**). This emergency contact information can include any one of the following: an emergency extension; an emergency phone-number; an emergency email address; or any other emergency address or location identifier that allows a call to be re-directed to a caller during an emergency. Still further embodiments include emergency information that is stored in the database **185** or in another storage element within the BWC system **160**. Transfer of the call using emergency information can, in some embodiments, cause the call to be re-directed to any of the following devices: a computing device; an electronic voice-mail; a server; a VoIP phone; a cell-phone; an analog phone; or any other computing device or telecommunications device. The BWC system **160** may deploy any type and form of system or use a service that determines the most effective or appropriate emergency contact number for contacting a user. In some embodiments, a service is used that verifies or confirms the current status of an ordered list of emergency contact info to determine at which number or telecommunication location, a user can be reached. In one embodiment, a service is used that determines the status of the emergency contact numbers. This embodiment of a service

can further determine to which emergency contact number the call should be redirected during an emergency. For example, upon the coverage path transferring to the BWC system **160**, the BWC system **160** may use a service or other method to check the status of stored contact numbers. The BWC system **160** then determines, in this embodiment, the last emergency contact number used to contact or reach a user, and attempts to redirect the call to this user. Still other embodiments include a BWC system **160** that attempts to transfer the call to one or more than one emergency contact numbers stored in the BWC system **160** and associated with a particular user.

[0102] In still other embodiments, if the BWC system **160** is unable to transfer the call to a contact number of the user, then the BWC system **160** may transfer the call back to the coverage path of the PBX. In some embodiments, the PBX will continue re-directing the call to the next point in the coverage path. For example, the PBX may then transfer the call to voice mail. In another embodiment, if the BWC system **160** cannot transfer the call to a contact number of the user, the BWC system **160** may terminate or drop the call. In some embodiments, the BWC system **160** may accept the call and provide a voice mail service for the user. In yet another embodiment, the BWC system **160** may transmit or forward the voice mail message to the user upon obtaining a working contact number or determining a contact number in which to reach the user.

[0103] In one embodiment of the system **401** (not illustrated), the BWC system **160** can provide a medium through which calls can be forwarded using a public switched telephone network (PSTN), or from a PSTN to a session initiation protocol (SIP) endpoint. In this embodiment, the BWC system **160** forwards or transfers the call to a soft-phone or IP phone, and acts like a PSTN for a SIP gateway. In some embodiments, an appliance within the BWC system **160**, transfers or translates the call to the soft-phone using a VPN appliance. The BWC system **160** can, in some embodiments, be deployed in the form of an appliance.

[0104] The method **401** can be further described as a method for implementing at least a part of a notification service, where the data center can act in part as a server that executes the BWC system application. In this embodiment, the method **401** is used to notify workforce members of an emergency event, or to notify workforce members of business related events and/or protocols during a system-designated emergency situation.

[0105] Illustrated in FIG. **2**B is one embodiment of a method **431** for redirecting a call generated by a caller using a private branch exchange **186** and determining that there is no response to the generated call. When feedback data indicates that the PBX extension rung did not answer, the call is transferred to a voice-over-IP (VoIP) gateway via a primary rate interface (step **433**). The VoIP gateway receives the transferred call, and transmits a SIP invite—call route request to a SIP redirect proxy (step **436**). The SIP redirect proxy requests a number forwarding lookup from the BWC system **160** and responds with a SIP **302** moved command with the forwarding number to the VoIP gateway (step **439**). The VoIP gateway then transfers, routes or translates the call from SIP to the PBX to re-direct the call to a forwarding number associated with the user (step **442**). In some embodiments, when the user does not answer when the call is redirected to the forwarding number, the coverage path of the PBX may have the call transferred to a voice mail server. Redirection of the call to the forwarding number associated with the user is accomplished using a primary rate interface, the public branch exchange, and using a public switched telephone network.

[0106] In one embodiment of the method **431** depicted in FIG. **2**B, when the call is redirected to the forwarding number associated with the user (step **442**), the VoIP gateway can receive a SIP **302** move command indicating that the call should be redirected to a SIP telecommunication destination. This destination can, in some embodiments, be an email address. When the redirect command is received, the call is redirected to the destination using a IP based telecommunication session established by the VoIP gateway over a network. The established telecommunication session can, in some embodiments, be between the VoIP gateway and a soft-phone, IP phone, or other VoIP phone associated with the destination address. Once the telecommunication session is established, the call is further re-directed to the destination email address, or other destination endpoint. In other embodiments of the method **431**, the VoIP gateway can establish a connection to a telephone using a second VoIP gateway that further provides a media gateway or interface via the public switched telephone network to a phone or other telecommunications device.

[0107] FIG. **2**C depicts an embodiment of the BWC system **160** using a click-to-call implementation to initiate the telecommunication session. A BWC system **160** client intercepts the number to call (number clicked), and pairs this with the users preferred call back device (e.g., cell or local extension) and sends the two numbers to BWC system **160**. BWC system **160** places both calls though the PBX and bridges the call once they are both connected. In other embodiments, the method **453** illustrated in FIG. **2**C can be a method for implementing a notification service using click-to-call as described in FIG. **2**B.

[0108] FIG. **2**D depicts another embodiment for outbound calling that is similar to click-to-call in an emergency location. In this embodiment, a BWC system **160** client on computing device **100** initiates an outbound call request to the BWC system **160** appliance. The BWC system **160** appliance first dials user at the emergency location and the BWC system **160** appliance bridges the call to the outbound number with the user's phone. In other embodiments, the method **457** illustrated in FIG. **2**D can be a method for implementing a notification service as described in FIG. **2**B and FIG. **2**C.

[0109] Illustrated in FIG. **3**A is one embodiment of a USB device **501** or stick configured to deliver BWC system **160** client-side application content. Included within the USB stick **501** is memory **518** that is partitioned into a read-only memory partition **512**, and a read-write memory partition **515**. Installed on the read-only memory partition **512** is a bootstrap loader application **503**; and installed on the read-write memory partition **515** is a sidebar loader application **506**, and a sidebar application **509**.

[0110] In one embodiment of the USB device **501**, the device is a USB stick **501**. Other embodiments could include any of the following memory devices in lieu of the USB stick **501**: a flash drive; a compact disc; a floppy disk; a flash solid-state drive; or any other memory device able to be partitioned to include the above listed elements. Other embodiments include a USB stick **501** with memory **518** that is read-only memory. Another embodiment includes a USB stick **501** with memory **518** that is a read-write memory. In the embodiment shown in FIG. **3**A, the read-write memory **515** can provide a secure storage element. Still other embodi-

ments include a USB stick **501** that reports two volumes when placed in communication with a computing device. The first reported volume is, in this embodiment, a data partition that is the bulk of the device's storage. The second reported volume is, in this embodiment, a section of memory that emulates a CD ROM device. This second volume includes an executable file that is executed by the operating system when the USB stick **501** is place in communication with the computing device. In this embodiment, the executable file detects another executable file included in the first volume (i.e. the data partition,) and executes that file to further execute the business continuity management application.

[0111] Other embodiments include a USB device **501** that includes a bootstrap loader application **503**. The bootstrap loader application **503** is the first application to execute once the USB device **501** establishes communication with a computing device. In one embodiment, the bootstrap loader uses a web service to download the required components for the sidebar application **509**, to update the components included on the USB device **501**. The bootstrap loader **503**, in this embodiment, further passes execution to the sidebar loader application **509** once the USB device **501** is updated. In other embodiments, the bootstrap loader **503** can detect outdated versions of the BCM application, and further download and install newer components from the WFC server **194**.

[0112] In one embodiment, the USB device **501** includes a sidebar loader application **506** and a sidebar application **509**. The sidebar loader application **506**, in this embodiment, provides the sidebar application **509** with settings, options and configuration files, which the sidebar application **509** uses to execute. Other embodiments include a sidebar application **509** that includes a sidebar loader application **506**. Still other embodiments include a bootstrap loader **503** that includes a sidebar loader **506**. The sidebar application **509**, in one embodiment, executes on the USB device **501** and further displays a graphical display of a sidebar on the display screen of a computing machine. In this embodiment, the computing machine is the computing machine that is in communication with the USB device **501**. Included within the sidebar application **509** are any of the following applications or services: status alerts; links to the portal; application delivery system; instant messenger; a soft-phone; roll call report; BWC system **160** client; forced contact information entry; remote desktop; message board; announcement board; or any other pre-defined application component or service. Other embodiments include either a sidebar loader **506**, or a sidebar application **509** with a sidebar loader **506**, where the loader application **506** communicates with the WFC server **194** to download all other program information useful to enable the USB device **501** to execute the business continuity management application.

[0113] Referring now to FIG. **3**B, an embodiment of a method for setting up and provisioning a business workforce continuity system **160** USB device **501** is depicted. An administrator may create one or more users via an LDAP directory service, import the users and create one or more groups. The users may be grouped logically by functional area, department, geography, emergency response team, etc. A USB stick **501** is provided to the users, and an email is sent to each of the users providing information and instructions with regards to provisioning. The user receives an email with an installation URL. Once the user receives this email and clicks on the installation URL, installation of an online remote desktop control and collaboration agent, such as GoToMyPC from Citrix Online is initiated, and a user is created in the GoToMyPC system. A workforce continuity client is then downloaded and installed on the USB stick **501**. In one embodiment, the workforce continuity client is downloaded or provided by the workforce continuity gateway or workforce continuity server. The installation processes installs a shortcut to GoToMyPC onto the stick. Upon completion of the installation, the USB stick **501** has been setup for the user to use with the BWC system **160** server or appliance in case of emergency.

[0114] Illustrated in FIG. **3**C is an embodiment of a method **521** for deploying the BWC system **160** using the USB device **501**. The method **501** includes receiving feedback data that indicates the USB device **501** was placed in communication with a computing device (step **523**). A connection between the computing device and the BWC system is authenticated (step **526**), and a remote access application is launched (step **529**). A connection is then established between the client and the user's host computer (step **538**).

[0115] Further referring to FIG. **3**C and in more detail, in one embodiment, communication between the USB device **501** and a computing device is established when a user plugs the USB device **501** into the computing device (step **523**). Other embodiments may not establish a connection until after a password is entered, or until after a secure connection is established between the USB device **501** and an business workforce continuity application executing on the computing machine.

[0116] The connection with the business workforce continuity servers, and in some cases business workforce continuity service, is authenticated (step **526**). In one embodiment, authentication is done using LDAP.

[0117] In some embodiments, the user launches a remote access application (step **529**). Embodiments include a remote access application that is GoToMyPC, or any other remote access application able to implement the methods and systems described herein. In this embodiment, the user is not required to provide any password or access code. Other embodiments include a client computing device that prompts the user for an access code or password. Still other applications may include a remote access application that is any other type or form of remote desktop control application, program or service, or any type and form or online collaboration tool.

[0118] Referring now to FIGS. **4**A-**4**N, embodiments of a web based user interface or portal provided by the BCM (WFC) server or via the BCM solution deployed as a SaaS model are depicted. The BCM provides a single point of contact for the setup, registration, and access of business and workforce continuity services, such as in the case of a disaster or emergency.

[0119] The BCM solution generally follows a three-step paradigm, methodology or scenarios of 1) prepare, 2) emergency, and 3) work. Under a preparation scenario, the BCM solution provides user interfaces and functionality to plan emergency scenarios, perform emergency drills or test, and to provision USB keys or devices. The preparation user interfaces and functionality described herein allow an emergency response team to prepare and configure emergency scenarios and configure the system for execution or deployment under a real emergency or disruptive event. When an emergency or disruptive event occurs, the BCM system provides user interfaces and functionality to deliver alerts and notifications to the user community, management and emergency response team as well as providing a roll and employee directory

mechanism to account for, and obtain status and other information from geographically displaced team members. The emergency functionality of the BCM system allows for seamless ad-hoc collaboration among a displaced workforce. As displaced team member come online via the BCM solution, the next phase is the work phase. The BCM solution with client-side access provided via a USB stick allows displaced workers to obtain access to applications and data via any remote computing device. A displaced worker may be able to obtain access to his or hers corporate computer via GoToMyPC or to a remote desktop computing environment via Citrix Presentation Server. Additionally, a displaced work can communicate via softphone, instant messaging. SMS and the like via the Voice infrastructure of the BCM solution to facilitate work and emergency related activities.

[0120] The components of the BCM continuity system or service comprises: 1) keys, 2) servers and 3) services. The BCM solution provides users access and communication tools and capabilities via a provisioned USB device, stick or key. The server component of the BCM solution provides alerts and notification services, communication services, such as those provided by Live Communication Server, and secure access services such as via a VPN or SSL VPN gateway. The BCM solution also integrates with and provides access to remote desktop control and access services, such as GoToMyPC, as well as SMS and VoIP delivery of communications.

[0121] With the web-portal and user interfaces depicted in FIGS. **4**A-**4**N, the BCM solutions provides scenario planning tools for Emergency Response Team personnel, as well as run-time collaboration and communication tools. The BCM servers and appliances provide an emergency communication and tracking solution for organizations. The BCM USB stick provides a simple and secure "work from anywhere" type solution for employees, such as employees displaced by an emergency or disruptive event.

[0122] Referring now to FIG. **4**A, the BCM user interface or web portal is designed and constructed generally with three types of personas: 1) emergency response team (ERT), 2) employees and 3) managers. The ERT prepare and configure scenarios, groups and zones as will be illustrated in further detail below. The employees receive and response to alert notifications and use a client-side sidebar and/or emergency workplace portion of the portal to work during the Emergency situation. Managers use the portal and user interfaces described herein to access history and reports, such as a roll call, in managing the workforce during an emergency or disruptive situation. Although generally described from the perspective of these three personas, the BCM user interfaces or web portals may be designed and constructed for other types of users.

[0123] FIG. **4**B depicts an embodiment of a user flow architecture in accessing or using the functionality provided by the BCM user interface or web portal. During the prepare phase, the ERT prepare zones, groups, surveys and notifications, and create, test and approve emergency scenarios. The employee may receive email with explanation on how to provision the USB device kit he or she received. Managers approve prepared or configured emergency scenarios.

[0124] During the emergency portion of the user flow, the ERT activate an emergency, send emergency alert notifications, and update status, issue announcements and surveys. Employees receive emergency alert notifications, respond and update contact information, and plug in USB device. A manager may use the remote workplace portion of the portal or BCM web-site to post messages, read status updates and answer surveys. Also, the manager may review, update or otherwise manage the roll call portion of the web-site.

[0125] During the work portion of the user flow, employees use the sidebar deployed via the plugged in USB device to collaborate with other employees via the BCM system. In some embodiments, the employee launches GoToMyPC to use work computer remotely. The manager reviews and works with reports and history information provided by the BCM solution.

[0126] FIG. **4**C depicts an embodiment of user interfaces for an ERT team member to create emergency scenarios. Via these user interfaces, ERT personnel created groups, zones, surveys, notifications, and scenarios. In one embodiment, a user interface is a graphical display shown to an end-user when the end-user access the BCM application. A group can, in one embodiment, refer to a grouping of workforce members. In this embodiment, the grouping of workforce members is done using member identification information; while in other embodiments, the grouping is done based on other user-characteristic data. Groups can be used by an ERT team member to send notifications or messages out to a group of workforce members as opposed to sending an individual notification to each workforce member. Zones are used by ERT, in one embodiment, to define geographical zones, and to further used the zone information to facilitate and enable communication between the ERT team members or managers, and more than one workforce member. Surveys and notifications are, in some embodiments, forms of communication between the ERT personnel and those workforce members that are not ERT personnel. In one embodiment scenarios are emergency-defined scenarios that dictate operation of the BCM application and WFC system **160** when certain pre-defined emergencies are detected by the WFC system **160**.

[0127] FIG. **4**D depicts an embodiment of user interfaces for a manager to approve a prepared scenario. In some embodiments, a scenario may be configured to require a predetermined or minimum number of signatures (e.g., electronic approval) before the scenario is approved.

[0128] FIG. **4**E depicts an embodiment of a BCM USB device kit provided to employees or users who will access the BCM services under an emergency or disruptive solution. The kit may comprise any type and form of case designed and constructed to hold the desired contents thereof. In some embodiments, the kit includes a USB drive or stick having content as described in conjunction with FIGS. **3**A-**3**C, any type and form of headset for telecommunications, and an instructional pamphlet. In some embodiments, employees would maintain the USB kit in a manner appropriate to have access during a workplace disruption or emergency situation.

[0129] FIG. **4**F depicts an embodiment of a user interface for an ERT to test a configured emergency scenario. In some embodiment, testing the emergency scenario is similar to a real emergency except for a smaller group of people. An ERT selects a scenario from a list of one or more configured scenarios, activates the test scenario and selected one or more recipients to participate in the test.

[0130] FIG. **4**G depicts embodiments of user interfaces for an ERT to activate an emergency. As shown in FIG. **4**G, an ERT selects a scenario from a list of one or more scenarios, and activate s the emergency scenario. In some embodiments, approval requests are issued if the activation of the scenario required approval. For example, approval requests may be, in

one embodiment, the emergency scenario does not complete activation until a minimum set of approvals are obtained. In others embodiments, approval requests are issued but are optional to activate the emergency. Upon activation or completion thereof, USB devices, sidebar and workplace functionality are activated.

[0131] FIG. **4**H depicts embodiments of user interfaces for providing employee emergency notification. The alert is activated and notifications are sent. Employees receive voice and SMS notifications, reply and update contact information. If available, the employees plug in their USB devices.

[0132] FIG. **4**I depicts an embodiment of a client-side sidebar which provides an emergency communication center that works in conjunction with and communicates to the BCM system. In some embodiments, the sidebar application is provided on or via the USB device. In other embodiments, the employee or user downloads the sidebar application from the BCM web-site or the WFC gateway or server to the user's computing device. The employee communications center provided by the sidebar application or agent displays status information, roll call, instant messaging and directory information. The employee communication centers provide links or access to Citrix Presentation server, remote control of a desktop of the user and access to the workplace functional area and user interface of the BCM portion as described herein.

[0133] FIG. **4**J depicts an embodiment of user interface for providing a roll call management and information screen for the manager role in the BCM system. The manager can get the latest roll call information and escalate a status of an employee or communicate or try to communicate with employees. The manager can create, modify or update a status of information in the roll call.

[0134] FIG. **4**K depicts an embodiment of the emergency workplace portion of the BCM web portal. In one embodiment, a user can access the emergency workplace from the sidebar or employee communications center. In the employee emergency workplace user interface, an employee reviews the current status of the emergency or disruptive information (for example, as it is updated by ERT personnel). The employee reviews announcements and participate (post and reply) in message boards. The user interface also displays information for the employee regarding the employee roll call, with links to surveys, resources and news. The employee can take surveys to provide information and status to the BCM system for updating reports and for tracking people and resources.

[0135] FIG. **4**L depicts an embodiment of a user interface for user to collaborate with regards to resources. In the employee emergency workplace of the web-portal, the user answers surveys and reviews replies to surveys. In one embodiment, the resources area of the workplace provides a graphical display of a map that identifies locations and types of resources. In some embodiments, the map is an interface and a user may add, edit or place/relocate resources on the map. In other embodiments, the map identifies geographical impacts and other status information related to the emergency or disruptive event.

[0136] FIG. **4**M is an embodiment of user interfaces for users to communicate with peers. Via the emergency communication center, users can search the corporate directory for contact information, including updated or emergency contact information. Via the BCM system and the emergency communication centers, inbound calls are re-directed from the office extension (e.g., PBX extension) to a new number, such as a soft-phone on the user's computing device or included in the sidebar. In some embodiments, inbound calls are redirected to the user of the communication center via any of the redirection embodiments discussed above in conjunction with FIGS. **2**A-**2**D. Via the emergency communication center, the user can place outbound calls. In some embodiments, the outbound calls may be forwarded, transferred or redirected via any of the embodiments discussed above in conjunction with FIGS. **2**A-**2**D. In yet another embodiment, the emergency communication centers enables user to chat or instant message their peers.

[0137] FIG. **4**N depicts an embodiment of a user interface to access the user's application and data. In some embodiments, the user launches a user interface from the emergency communications center to access applications and data via an application delivery system, such as Citrix Presentation server. For example, the user clicks on the "my programs" user interface element as depicted in FIG. **4**M. In other embodiments, the user launches a user interface to access a remote desktop, such as a corporate or office computer, via GoToMyPC services. For example, the user clicks the GoToMyPC user interface element as depicted in FIG. **4**N.

[0138] FIGS. **5**A-**5**C each depict an embodiment of a plurality of user interfaces for the sidebar or WFC client. The sidebar user interfaces of the emergency communication center may display one or more of the following: 1) one emergency active, 2) multiple emergencies active, 3) emergency over, 4) no active emergency, 5) search results, 6) the logged in user's status and info and contact information 7) peer information, 8) chat session, 9) chat archive, 10) soft-phone calling, 11) soft-phone call in progress status, and 12) call history.

[0139] FIGS. **6**A-**6**C depicts embodiments of a plurality of user interfaces for startup screens when a user deploys and uses the BCM USB stick to access BCM servers or services, such as in the case of an emergency or disruptive event. The startup user screens may display one or more of the following types of screens: 1) no internet connection, 2) a login and password screen, 3) error logging in message, 4) welcome, no emergencies in progress, 5) welcome, active emergencies in progress, updating software, 6) welcome, no emergency in progress, update in progress, 7) welcome, active emergencies in progress, update contact information, 8) welcome, active emergencies in progress, update complete, 9) welcome, one or more emergencies in progress, and 10) welcome, emergency over.

[0140] Illustrated in FIG. **7** is a method **461** for providing a business workforce continuity system that further provides a displaced workforce with business continuity. A server executes at least a portion of the business continuity application (step **463**). The server interfaces with a notification service (step **466**), and issues notifications to at least a portion of the workforce when an event occurs (step **465**). A remote access service also interfaces with the server to provide access to computing resources during the occurrence of an event (step **469**). The server also interfaces with a communications gateway which is further interfaced with a private branch exchange (step **472**). A portion of the business continuity application, after the occurrence of an event, is displayed to an end-user using a computing device that further communicates with a portable memory device (step **475**).

[0141] Referring to FIG. **7** in more detail, in one embodiment of the method **461**, a server executes at least a portion of

the business continuity application (step **463**). In one embodiment, the business continuity application is the business workforce continuity system **160**. Other embodiments include a business continuity application that is displayed to a displaced workforce of an organization, when an event occurs. The server, can in one embodiment, be a computing device like the above described computing device **100**. In this embodiment, the server can be a computing device at a data center. Other embodiments include a server that stands alone, or a client machine or third computing device able to execute at least a portion of the business continuity application. In one embodiment the business continuity application includes an application for defining a response scenario to the occurrence of the event.

[0142] In one embodiment, the method **461** further includes interfacing a notification service to the server computing device (step **466**). The notification service can be any of the systems illustrated in the above figures, including those that depict a method for re-directing phone calls to emergency phone numbers or to other emergency points of contact. Within these embodiments, the notification service can be further used to issue notifications to at least a portion of the workforce in response to the occurrence of an event (step **465**).

[0143] A remote access service also interfaces with the server or data center to provide the workforce members with access to computing resources during the emergency event (step **469**). In one embodiment, the remote access service can be any of the above described remote access services such as any of the following: thin-client computing applications; remote display presentation application; Citrix Access Suite; Metaframe or Citrix Presentation Server; terminal services; any type of hosted server application like GoToMeeting, Webex, or Live Meeting; or any other type of application that provides workforce members with remote access to computing resources associated with the workforce. In one embodiment, the computing resources can include applications, files, and file directories located within the workforce computing environment. The remote access service is available, in some embodiments, when there is no emergency event. Other embodiments include a remote access service that is available only during emergency events.

[0144] In one embodiment, a communication gateway interfaces with both the private branch exchange and the server (step **472**). In this embodiment the communication gateway can be any of the above described gateways including: a workforce continuity gateway **192**; a media gateway **198**; a VoIP gateway; or any other appliance, computing machine or other device that provides an interface between the private branch exchange and the server. Other embodiments include a communications gateway that further provides a portion of the BWC system application.

[0145] A graphical display is shown to an end-user using a computing machine that accesses the BWC system **160**, where the computing device is in communication with a portable memory device (step **475**). In one embodiment, a portion of the business continuity management application is displayed to the end-user. Portions of the business continuity management application can include any of the following elements of the BWC system **160** either alone or together in combinations of two or more elements: sidebar application; remote access capabilities; call re-direction; emergency activation; more than one emergency activation; emergency activation management; emergency activation approval; search results; peer-to-peer chat sessions amongst members of the workforce; chat sessions and chat archives; soft-phone; call history; workforce member status information; account management; user status information update; remote file access; virtual meeting access; emergency call logging; storage of emergency contact information; a directory service; audio communication application; remote or local access to business tools; or any other aspect of the BWC system **160** and BCM described herein. Other embodiments display the entirety of the business continuity management application. Embodiments include a computing device in communication with a portable memory device, where the portable memory device is the USB device **501**. Other memory devices may be used including any of those memory devices described herein.

What is claimed is:

1. A method of providing a business continuity application to a portion of a displaced workforce of an organization in response to the occurrence of an event, the method comprising:

providing a server computing device at a data center, the server computing device executing at least a portion of a business continuity application, the business continuity application including an application for defining a response scenario to the occurrence of the event;

interfacing a notification service to the server computing device, the notification service issuing a notification to at least a portion of the workforce in response to the occurrence of the event;

interfacing a remote access service to the server computing device, the remote access service providing access to computing resources associated with the workforce during the occurrence of the event;

interfacing a communications gateway to a private branch exchange of the workforce and to the server computing device, the communications gateway providing at least another portion of the business continuity application; and

displaying, to an end-user of a computing device having a portable memory device in communication therewith, portions of the business continuity application after the occurrence of the event.

2. The method of claim **1**, further comprising providing a business continuity application via application streaming.

3. The method of claim **1**, further comprising providing a business continuity application via an remote display protocol.

4. The method of claim **1**, wherein providing a business continuity application further comprises providing the business continuity application as a service.

5. The method of claim **1**, wherein issuing a notification to at least a portion of the workforce further comprises:

placing a call to a number designated by a caller, to establish communication between a first endpoint and a second endpoint;

receiving feedback information indicative of the failure to establish communication between the first endpoint and the second endpoint;;

redirecting the call to a portion of the notification service;

retrieving, from a storage element, contact information associated with the caller designated number and indicative of a third endpoint; and

placing a call to the retrieved contact information, to establish communication between the first endpoint and the third endpoint.

6. The method of claim **5**, wherein placing a call to a second endpoint further comprises placing a call to a member of the workforce.

7. The method of claim **6**, wherein retrieving contact information further comprises retrieving an emergency number associated with the member of the workforce.

8. The method of claim **6**, wherein retrieving contact information further comprises retrieving an email address associated with the member of the workforce.

9. The method of claim **5**, wherein placing a call to the retrieved contact information further comprises placing a call to the retrieved contact information using one of either of the private branch exchange and a public switched telephone network.

10. The method of claim **5**, wherein placing a call to the retrieved contact information further comprises placing a call to the retrieved contact information using a virtual private network.

11. The method of claim **1**, wherein providing access to computing resources associated with the workforce further comprises providing access to information on a client machine using a remote display protocol.

12. The method of claim **1**, wherein displaying portions of a business continuity application further comprises displaying a graphical user interface representative of a status of the occurrence of the event.

13. The method of claim **1**, wherein displaying portions of a business continuity application further comprises displaying a graphical user interface representative of a directory service that accesses information of the workforce.

14. The method of claim **1**, wherein displaying portions of a business continuity application further comprises displaying a graphical user interface for establishing and interacting with an audio communications session.

15. The method of claim **1**, wherein displaying portions of a business continuity application further comprises displaying a graphical user interface for establishing and interacting with an instant messaging system.

16. The method of claim **1**, wherein interfacing with a communications gateway further comprises interfacing with a workforce gateway within a workforce continuity system.

17. The method of claim **16**, wherein interfacing with a workforce gateway further includes establishing a connection via a network installed between the computing machine and the private branch exchange.

18. A graphical user interface displayed on a computing device for use in providing continuity to an employee of workforce in response to the occurrence of an event, the graphical user interface created by a program stored on a portable memory device, the graphical user interface comprising:

a first portion displaying, by a first portion of the program stored on a portable device associated with an employee of the workforce, information related to the status of the occurrence of the event;

a second portion displaying a plurality of business tools available to the employee, each business tool being represented as icon and associated with a computing device providing the respective business tool;

a third portion providing a directory service to the employee, the directory service associated with directory information of the workforce; and

a fourth portion displaying a list of at least a portion of the employees of the work force and a status related each of the employees listed and a providing a mechanism for establishing at least one of an audio communications session and an instant messaging session.

19. The graphical user interface of claim **18**, wherein the portable memory device is a universal serial bus device.

20. The graphical user interface of claim **19**, wherein the universal serial bus device further comprises:

a first reported volume configured to store data, a portion of the data including the program stored on the universal serial bus; and

a second volume configured to store a bootstrap loader application, the bootstrap loader application further configured to update and execute the stored program.

21. The graphical user interface of claim **18**, wherein business tools include a remote access application providing remote access to a server in communication with the computing device.

22. The graphical user interface of claim **18**, wherein business tools include a remote access application providing remote access to a second computing device in communication with the computing device.

23. The graphical user interface of claim **18**, wherein the directory service is further in communication with a storage element configured to store workforce member contact information.

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