

Stephen Gray

Expertise

- Distributed Computing Architecture
 - Internet/Web/e-Commerce
 - Web Services Protocols/SOA
 - Client/Server Technology
 - User Interface Technology
 - Software Architecture
 - Image and Document Processing
 - Relational Database Design
 - Network Architecture
 - Software Quality
 - Software Development Life Cycle
 - Clean Room Design
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Professional Summary

Mr. Gray has over 30 years of experience in the computer and communications industries. His background includes systems and software architecture, design and development as well as senior management positions in development, marketing, and general management.

Employment History

From: 1984 **Gray & Gray, LLC**
To: Present San Diego, CA
Position: *Principal*

Mr. Gray is an expert in modern computing platform architecture, design, implementation and integration, including relational database design in networking environments. In providing consulting services, he has successfully completed the following projects:

- Performed patent portfolio analysis for large corporations
- Developed policies and procedures for a “clean” software development environment. Monitored activities to ensure conformance.
- CSO for a Business Process Management software start up. The firm develops Web Services/SOA based BPM creation, orchestration, management and optimization solutions.
- CTO for an e-Commerce Internet start up. The firm developed a product that specializes in procurement for public agencies.
- Interim CEO for a broadband Competitive Local Exchange Carrier (CLEC). Helped negotiate the successful sale of the CLEC.
- CTO for an Internet-based secure content distribution startup. The firm developed comprehensive Digital Rights Management (DRM) solutions for the control and promotion of content on the Internet.
- Architected several e-Commerce applications for legacy interoperability

- Participated in the architecture definition and design of a highly scalable, high performance device controller for multifunction document processing products
- Performed a detailed analysis of the competitive environment for retail point-of-sale hardware and software systems. Analysis included technology, marketing, compensation and back office interface issues
- Provided system design, product selection and project management for a turnkey software/hardware system for residential refuse hauling and toxic waste disposal company. System involved multiple hardware and software vendors around the IBM AS400 central processing system
- Led the design of a high performance, LAN-based image capture and statement printing subsystem using IBM system components using DBII relational database and SQL language for TRW
- Led the design of an image assisted, remittance processing system using IBM system components and Sybase relational database in a client/server architecture for TRW. Additionally, designed an object-oriented front end to the database so that the UNIX platform could execute Sybase applications
- Engaged to perform a technology audit for the United States Department of Agriculture using ORACLE database products, which resulted in a major overhaul of the database management implementation for their application
- Collaborated with FileNet to develop an IBM-to-UNIX interconnection strategy for their optical disk-based document imaging and filing system
- Defined high speed interconnection and relational database methods using SQL language for Marriott Corporation to handle large transaction volumes in a hotel reservations system
- Collaborated with Xerox in mid 1990s development of an electronic printing system front end supporting a wide range of advanced printing services, including resolution enhancement technology
- Advised Northern Telecom on the performance of IBM's Net View product
- Authored two technical seminars: SNA Technology Update, OS/2 and SAA, Introduction to Client/Server Technology with special emphasis on relational database management. Published articles in trade journals such as Interface Age, CASE World and Info World

From: 2001 **Networld Exchange Incorporated**
 To: 2002 Bonsall, CA
 Position: *Chief Technical Officer*

Networld Exchange, Inc. (NEI) provides Fortune 2000 companies private trading exchange (PTX) solutions that automate their B2B commerce activities. NEI is a restart. NEI is funded by institutional investors in New York and Florida. Mr. Gray was recruited in 4Q01 by the investors as part of the new management team.

From: 2000 **NTN Communications**
To: 2001 Carlsbad, CA
Position: *Chief Technical Officer*

NTN Communications, Inc. (AMEX: NTN) is the parent corporation of two operating divisions: Buzztime Entertainment, Inc. and the NTN Network®. Mr. Gray serves as CTO for the parent corporation and each of its operating divisions.

Buzztime Entertainment, Inc. develops and distributes sports and trivia games to a variety of interactive platforms including interactive television, the Internet, PDS and mobile phones.

The NTN Network, NTN's hospitality business, operates two interactive television (ITV) networks that broadcast games to millions of consumers each month at 3500 restaurants, sports bars and taverns in North America.

Mr. Gray is responsible for all of the technical aspects of the corporations as well as forward looking programs and business opportunities.

From: 1987 **Simpact Associates**
To: 1988
Position: *Director, Product Marketing*

Directed the full life cycle of definition, delivery, marketing and enhancement of four sets of IBM connectivity products, including:

- SNA protocol support hardware and software for DEC VAX systems
- An IBM PC-based gateway product that supports SNA and other industry-standard communications architectures
- A Netware-based Token Ring Network adapter board and software for DEC VAX systems
- A hardware/software product that receives financial market feeds and reformats the information for presentation to programs running a VAX via a proprietary applications programming interface (API)

From: 1982 **Xerox Corporation**
To: 1987
Position: *General Manager, Host Software Products*
1985-87 As the founder and leader of the product delivery organization of a Xerox independent business unit, Mr. Gray managed 21 employees and

33 contract professionals. He directed the definition, architecture, design, development, test, product transfer and sustaining engineering of six products for electronic page printers connected to IBM mainframes (MVS, VSE, VM), DEC VAX (VMS) and IBM PC's (DOS).

1982-85

Manager, Foreign System Interconnect. Managed four professionals who defined and developed the technical interconnect strategy for electric page printers to wide-and local-area networks. Mr. Gray's group delivered host software, network and printer engineering services. He developed a new printer interconnection technique, interfaces to Ethernet local area network, and designed connections to IBM mainframes using SNA and the System/370 channel.

From: 1979 **Computer Communications, Inc.**

To: 1982

Position: *Manager, Communication Controller Software Development*
As leader of the architecture, design, development, and testing of an SNA communications controller in the MVS operating environment, Mr. Gray managed 24 professionals. His group successfully designed, developed and deployed the controller's operating software, diagnostics, host-based compilers, and system support software. Before that, he was the product manager for front-end processors and remote concentrators. Also, he engineered an X.25 multi-channel controller.

From: 1977 **Olivetti Corporation**

To: 1979

Position: *Regional Support Manager*
Started as a district manager and later became a regional software support manager for a series of mini- and microcomputer business systems. Applications included general business and on-line front-office banking.

From: 1973 **Burroughs Corporation**

To: 1977

Position: *Systems Programmer, Systems Analyst*
Specializing in data communications software and held several design and product implementation positions in the mid range and small system development groups (MCP).

Additional Professional Experience:

- Designed and implemented numerous relational database management systems using Sybase, Informix, Microsoft Access, DB2.
- Knowledgeable in C, C++, SQL, COBOL, RPG, Basic, Java, various Assembler languages, HTML, XML and others.

- Designed IBM SNA Distribution Services compatible electronic mail interface product. The product interfaced to MCI mail services.
- Designed peer-to-peer printing network product for MCI
- Designed image-processing system for TRW on contract with the Internal Revenue Service. Participated in the implementation of a prototype of the system.
- Designed image based item processing system for TRW and IBM Participated in the implementation of a prototype of the system.
- Defined IBM interoperability strategy for FileNet products.
- Defined distributed network printing product for Xerox.
- Defined and managed several networking products for Simpack Associates. Used the System Strategies Inc. Express SNA package.
- Defined, designed and implemented several interoperability interfaces to Xerox Electronic Printers.
- Defined, designed and implemented telecommunications control devices for Computer Communication Incorporated.
- Developed and presented numerous public and in-house courses in IBM, Unix, Internet and related operating system and networking technologies.
- Member of UCSD Connect "Most Innovative Product Award" Selection Committee (2002, 2003, 2004).

Member of Association of Computing Machinery and Institute of Electronic and Electrical Engineers

Education

<u>Year</u>	<u>College/University</u>	<u>Degree</u>
1973	California Polytechnic University	BS, Economics