

Christopher R. Hertel

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POSITION HISTORY

Software Developer Senior Principal Engineer

Dell Compellent, Eden Prairie Minnesota, September 2014—Present

- File System Protocols Architect.
- Storage Subsystem Design Engineer.

Senior Principal Software Engineer

Red Hat, Inc., Minneapolis Minnesota Office, January 2012—2014

- Samba Virtual File System design and development.
- Cluster File System Integration.
- Team lead.

Storage Architect and CIFS Geek, Founder and CTO

ubiqx Consulting, Inc., Saint Paul, Minnesota, September 2007—January 2012

- Team leader, head researcher, and author.
 - 2+ year project to create new Microsoft SMB/CIFS protocol specification documents: [MS-CIFS], [MS-SMB].
 - Hired and managed a 5 person team of writers and engineers; worked with customer's managers and engineers.
- Samba Virtual File System development and documentation.
- Windows/Linux file system meta-data analysis.

Storage Architect/Storage Systems Consultant

Alvarri, Inc., Minneapolis, Minnesota, March 2006—September 2007

- Design, deployment, and management of a \$1.6M storage testing laboratory for a major supercomputer manufacturer.
- Network protocol analysis and software development focusing on CIFS, iSCSI, and NDMP.

Saint Paul Broadband Advisory Committee

Saint Paul, Minnesota, July 2006—September 2007

- Member of a Committee to advise the Mayor and City Council regarding the design and deployment of Broadband services in Saint Paul, Minnesota.

Storage Network Design Engineer

University of Minnesota Data Management Services (UDMS), Minneapolis, Minnesota

February 2005—February 2006

- Design and deployment of a campus-wide IP storage network for the University of Minnesota.
 - The campus community includes over 66,000 students, faculty, and staff in approximately 600 departments.
- iSCSI planning and deployment
 - Select products for production deployment and design network infrastructure.
- Creation of a central Network Attached Storage (NAS) service.
 - NFS and SMB/CIFS file sharing services available to the entire campus.

Embedded Operating Systems and Distributed Authentication Consultant

Amiga, Inc., Snoqualmie, WA

January—September 2000

- Co-developer of the Amiga/DE (Developer's Edition) Operating System.

jCIFS Team Co-Founder & Member

1999—Present

- Established the jCIFS project, to produce a comprehensive Open Source SMB/CIFS client in Java.

Samba Team Member

1997—Present

- One of approximately 20 to 30 developers world-wide with responsibility for the continued development of Samba, the popular Open Source implementation of Microsoft's SMB (aka. CIFS) protocol suite.
- Author of [Implementing CIFS - the Common Internet File System](#), a book describing the internals and workings of the SMB/CIFS protocol suite. ISBN: 0-13-047116-X, Prentice Hall PTR, August 2003.

Network Design Engineer

University of Minnesota Networking and Telecommunications Services (NTS), Minneapolis, Minnesota

March 1996—February 2005

- Member of the Network Design Team. Responsibilities include:
 - Design lead for campus wireless networking.
 - Collaborate on overall campus network design and the development of long-term network strategy.
 - Design and implementation of small to large departmental networks.
 - Design and implementation of Internet services for off-campus University sites.
 - National and international inter-networking support (including Commodity Internet, Internet2, etc.).
 - Development and establishment of University network standards.
 - Second-tier support for network problem resolution.
 - Research, testing, and evaluation of emerging technologies.
- Adjunct member of the University Security Incident Response Team (SIRT) through 2000. Responsibilities included:
 - Designated SMB/CIFS network protocol expert for security issues.
 - Design of mechanisms to implement University Auditing requirements.
 - Detection of scans, probes, intrusions, and compromised systems.
 - Investigation of security incidents; Incident reporting and remote-site notification.
- Other Responsibilities:
 - Technical design lead for 802.11 wireless LAN projects and campus-wide wireless deployment.
 - Liaison between Network Design and University Data Services (SAN & NAS infrastructure).
 - Troubleshooting of all campus network services including DNS, routers, switches, & GigE backbone.
 - Collaboration on campus DSL, Broadband, Virtual Private Network (VPN) strategies, and off-campus connectivity.
 - SMB/CIFS, and other higher-level protocol suites.
 - Unix System Administration, TCP/IP Network administration.

Unix System Manager and IVR System Developer

DCA, Inc., Minnetonka, Minnesota

June 1993—March 1996

- Design, implement, and maintain a Unix-based Interactive Voice Response (IVR) System and associated applications.
- Install, configure, and maintain all Unix systems, including SVR4.2 PC systems and an NCR 3555.
- Install, configure, and maintain Novell NetWare systems (clients and servers).
- Perform TCP/IP Network Administration including configuration of services (name server, FTP, NTP, SMTP, etc), and integration with VAX/VMS and NetWare environments.

Banking Systems Consultant

ESP Software Services, Inc., Minneapolis, Minnesota

March 1992—June 1993

- Systems Analysis to develop a Front Office Consumer Loan package; First Bank Systems, Saint Paul, Minnesota.

PC Network Team Manager and Micro Systems Software Engineer

Caisse Nationale de Cr dit Agricole, Chicago, Illinois

1986—September 1991

- Designed and implemented a custom coast-to-coast wide area microcomputer network based on DEC PathWorks.
- Managed of a team of network and PC support personnel for all US offices of Cr dit Agricole.
 - Hired and trained team; wrote performance reviews and provided career path planning assistance.
 - Managed support for all PC users, including budgeting, hardware & software configuration, and training.
 - Assigned and managed team projects.
 - Responsible for hiring and supervising contract programmers for special projects.
- Developed network applications, services, and support programs.
- Designed and developed remote access software to provide file and E'mail access via dial-up systems.
- Managed network servers (VAX/VMS & DEC PathWorks), including performance tuning, security management, hardware and software installation, configuration, and maintenance.
- Provided needs analysis, product research, system development, and user training for individual and large groups.

Senior Programmer

The Northern Trust Company, Chicago, Illinois

1984—1986

- Designed and developed system and application software, including securities tracking applications and inter-system data transfer utilities.
- Provided co-workers with training in programming languages and methodologies; established programming standards and procedures.
- Tested and evaluated third party software.

CONSULTING CLIENTS

Microsoft Corporation, Redmond WA

CIFS Protocol Documentation
May 2008 – June 2010

Nexenta, Mountain View CA

Protocol Analysis
August 2010

Smapper Technologies, Santa Clara CA

Product Technology Review
April 2010

Quantum Corporation, Mendota Heights MN

Samba and Linux/Windows meta-data interactions
November 2007 – March 2008

Cray Inc., Mendota Heights MN

Supercomputer storage subsystem design & deployment
March 2006 – September 2007

Certeon, Burlington MA

CIFS Protocol and Authentication
October – November 2006

FineGround Networks, Campbell CA

(now owned by Cisco Systems)
CIFS Authentication Mechanisms
February 2005

Peribit, Inc., Santa Clara CA

(now owned by Juniper Networks)
CIFS Protocol Analysis
July – September 2004

Rainfinity, Inc., San Jose CA

(now owned by EMC)
CIFS Protocol and Authentication
February – March 2002

Telco-Tech, GmbH, Berlin, Germany

Firewall/VPN Product Design
November 2000

Amiga, Inc., Snoqualmie WA

Operating System & Distributed Authentication Design
January – September 2000

SPEAKING ENGAGEMENTS

Twin Cities Code Camp, October 2011

Samba in the Age of Microsoft Glasnost
The Architectural and Implementation Challenges Ahead

SambaXP, May 2011 / SNIA SDC, September 2011

CIFS Geeks in Exile: What We Did on our Holiday
MS BITS and BranchCache Implementations for Linux

SambaXP, May 2010 / SNIA SDC, September 2010

Are We There Yet?
The long, winding road to SMB/CIFS specifications
Detailed review of new SMB/CIFS documentation.

Twin Cities Computer Measurement Group, March 2010

Cloudbursting
Cloud storage, Network Bandwidth, and Big Data

Connectathon, February 2010

SMB/CIFS: It's not dead yet
SMB/CIFS protocol and documentation overview for the uninitiated storage developer.

Northland Technology Consortium, March 2008

Space: The Final Frontier
Storage Technology Overview and Trends

North Central Linux Symposium, June 2007

Comparing SCSI and ATA as network block protocols

GeekCruises Linux Lunacy IV, October 2004

Samba 3 Configuration and Operation
Three hour Samba, jCIFS, and SMB/CIFS file sharing tutorial presented on a Mediterranean cruise.

TEACHING EXPERIENCE

- Advisory Committee Member, UofM College of Continuing Education (CCE) IT Infrastructure program (2009-present).
- Adjunct Faculty, UofM College of Continuing Education (CCE), INet 4032: Storage Design & Administration (2008).
- Curriculum Developer, UofM CCE, INet 4032: Storage Design & Administration (2007-8).
- Guest Lecturer—Wireless Networks, Data Storage, UofM CCE B.A.S. Degree Program (2002-7).
- Substitute Instructor, CCE B.A.S. Information Technology Infrastructure Major, Network Programming class (2004).
- Adjunct Faculty, North Hennepin Technical College (1999).
- Adjunct Faculty, National College of Education (1988-1989).
- Instructor, The Computer Institute, (1983).

WRITINGS

login: Magazine (USENIX Society)

Server Message Block in the Age of Microsoft Glasnost, February 2012

[MS-CIFS]: Common Internet File System (CIFS) Protocol Specification

[MS-SMB]: Server Message Block (SMB) Protocol Specification

Lead author. Published under the MCPP/WSPP program. Copyright Microsoft Corporation, 2010

Implementing CIFS - the Common Internet File System

ISBN: 0-13-047116-X, Prentice Hall PTR, 688 pages, August 2003

Storage Networking Industry Association (SNIA) Common Internet File System (CIFS) Technical Reference

Contributing Author, February 2002

Linux Magazine

- iCIFS: The SMB Can Opener, Feature Article, February 2005
- Understanding the Network Neighborhood, Feature Article, May 2001
- The Story of Samba: Linux's Stealth Weapon with Luke K. C. Leighton, September 1999

The UNIX System Today

Co-Author (provided the chapter on **Samba**)

ISBN: 1-85912-296-5, The Open Group, May 2000

TECHNICAL SKILLS

Operating Systems:

Linux, *BSD, Irix, Unix System V, Solaris, VAX/VMS, AmigaDOS, and (when absolutely necessary) Windows.

Programming & Shell Languages:

C, Java, HTML, Python, Pascal, Modula-2, sh, ksh, bash, etc.

Networking:

Samba/CIFS, SMB2, NFS, NAS, iSCSI, ATAoE, NDMP, TCP/IP, VPN, Fibre Channel, Ethernet, Routers, Switches, Hubs, WiFi Access Points, Firewalls, design, deployment, protocol development and analysis, etc., etc., etc.

EDUCATION

Degree:

- B.A. in Biology, Grinnell College, Grinnell, Iowa (1983)
- Foreign Study, Durham University, Durham, England (1981-82 academic year)

Graduate Courses:

- Real Time Operating Systems; Advanced Operating Systems; University of Minnesota, 2001 (4.0 GPA)
- Compiler Design; Advanced Compiler Design; Computer Networks; DePaul University, Chicago, Illinois, 1987-1990 (4.0 GPA)