

# George V. Neville-Neil

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## Experience

### **MSB Associates** *Belmont, California and Brooklyn, New York* March 2014 - Present

Working as a consultant with various companies on high performance computing, networking, security and time protocol projects, including:

- Securing a high end, consumer focused, Wi-Fi router system, including both embedded and on-line components.
- Research and Development on DTrace for CADETS Project, part of DARPA's Transparent Computing Program.
- Working with an enterprise storage vendor on network protocol conformance testing framework and systems development and remediation for issues found in their network protocol stack.
- Designed, deployed, and maintain a network of PTP grand-masters using open source software.
- Ongoing performance analysis and remediation of network protocol software for TCP, IP, and IPSEC protocols as well as kernel based packet filtering frameworks.
- Purpose built, high performance switch for use in a clustered packet filtering solution.
- Extensions to DTrace framework and probes for use in network protocol measurement and debugging.

### **Hudson River Trading** *New York, New York* January 2008 - January 2014

Kernel programmer extending and maintaining FreeBSD, the operating system used by the company for all trading and research. Extended 10GbE NIC driver to have a low latency, kernel bypass mode for use in trading operations. Wrote performance evaluation system for measuring latency of multicast traffic. Diagnosed and fixed storage performance issues in the company's HPC research cluster dealing with issues of incast and proper use of Isilon storage clusters. Took over and maintain the open source, Precision Time Protocol daemon, PTPd (IEEE-1588). PTP keeps distributed clocks accurate to within 1us in a LAN. Added code to Ethernet driver to support the PTP. Developed an innovative method for measuring clock drift amongst machines. Updated and extended support for Hardware Monitoring Performance Counters for Nehalem, and other Intel processors. Added support for performance events to the PAPI library. Worked with members of other groups to identify and address performance issues by using the hwpmc system. Built the in house test lab for simulating problems encountered on the trading network. Extensive debugging of networking issues

### **Yahoo Inc.** *Sunnyvale, California* August 2004 - December 2007

Member of the Paranoids group which oversees all aspects of application security at

Yahoo. Developed and delivered the Paranoid University, a set of more than 10 hours of classes covering security and fail safe programming. The Paranoid University has now been delivered by myself and others at all Yahoo development centers, worldwide. Responsible for system and code review of internal products to make sure that they meet appropriate security standards. Built code spelunking and code scanning tools that find security holes in various types of source code. Working on an open source network protocol conformance test suite, [Packet Construction Set](#) as well as the [Packet Debugger](#)

**Nominum Inc.** *Redwood City, California* May 2002 - August 2004

Developing a high performance DHCP server for use in large commercial installations. Working on all aspects of the system from low level packet interfaces to integration of scripting languages for use by customers. Integrated first language, Python, for the latest release.

**Wind River Systems** *Alameda, California* July 1999 - November 2001

Brought on as a Senior Member of Technical Staff for Networking. Member of the Network Architecture Council which studied infra-structural issues in current networking products, prototyped solutions, and communicated these to project teams. Led a team implementing a BSD derived TCP/IP stack that can support Virtual Private Routed Networks so that multiple TCP/IP stacks can run on the same system simultaneously. Delivered to select customers in 2000. Full release in 2002. Designed new additions to routing sockets improving the set of messages for routing applications. Worked with the VxWorks AE team on issues related to networking components. Performed technical due diligence on all networking related corporate acquisitions.

**Siara Systems Inc.** *Mountain View, California* March 1999 - June 1999

Worked on designing and implementing a mechanism for hot failover of a TCP/IP stack. Researched creating a TCP/IP stack that could handle VPNs in a Virtual Routed environment. Worked with other engineers on identifying features that would have to be added to support a SONET capable router.

**Wind River Systems** *Alameda, California*

January 1998 - February 1999

**Promoted** to manager of the Core Network Technologies group. In this capacity I was responsible for the maintenance update to the TCP/IP Network stack and associated software. Delivered the SENS 1.1 release of the networking software. Managed a group of 7 engineers who worked on various networking projects (TCP/IP, SNMP, performance analysis, and general maintenance). Recruited, and hired four of the seven members of the team. Wrote performance appraisals and performed other general management functions. Evaluated outside companies for possible acquisition.

December 1995 - January 1998

Designed and implemented the Enhanced Network Device specification. END divorces protocols from drivers and gives a uniform interface for all protocols to networking device drivers. Wrote interface between VxWorks TCP/IP and END subsystem. Wrote a complete test protocol for END drivers. Ported routed(1) (RFC 1058) to VxWorks and

added RIPv2 (RFC 1723) functionality.

## Publications

- [The Design and Implementation of the FreeBSD Operating System 2nd Ed.](#), co-author, Addison-Wesley, 2014
- *The Design and Implementation of the FreeBSD Operating System*, co-author, Addison-Wesley, 2004
- *Kode Vicious*, Monthly Column in *ACM Queue* October 2004 to Present.
- *Measure Twice, Code Once: Network Performance Analysis for FreeBSD*, with Jim Thompson, published in *FreeBSD Journal* Vol. 2, No. 3, June 2015
- *hwpmc(4)*, published in *FreeBSD Journal* Vol. 1, No. 2, March 2014
- *Whither Sockets*, published in *ACM Queue* Vol. 7 No. 4, May 2009
- *Understanding and Tuning SCHED\_ULE* BSDCan 2009 Presentation *Performance Analysis with hwpmc* DCBSDCon 2009
- *Security, Safety, and the Deployment of IPv6*, *ACM SIGCOMM IPv6 Workshop*, Kyoto, Japan, August 2007
- *Securing IPv6 on FreeBSD*, BSDCan 2007, Ottawa Canada, May 2007
- *The Design and Implementation of the FreeBSD Operating System*, co-author, Addison-Wesley, 2004
- *Code Spelunking: Exploring Cavernous Code Bases*, published in *ACM Queue*, September 2003
- *Programming Without a Net*, published in *ACM Queue*, April 2003
- *SoC: Software, Hardware, Nightmare, Bliss*, (co-author), published in *ACM Queue*, April 2003
- *Evolving the BSD 4.4 Network Interface Framework*, published in *Communication Design Engineering Conference 1997*, March 1997
- *No-Copy TCP/IP for Embedded Communication Applications*, published in *Communication Design Engineering Conference 1997*, March 1997.
- *User Controllable Network Configuration In VxWorks*, published in *Proceedings of the VxWorks Users Group Meeting*, November 1995.
- *Issues in the Design of Continuous Media Systems*, Pegasus Project Technical Report~94--1.
- *Current Efforts in Client/Server Audio*, published in *The X Resource*, Fall 1993.
- *BUENA: A protocol for Digital Audio*, published in *Summary Report, Communications Work Package, Pegasus Project*, September 1993.

## Presentations and Teaching History

- [Guest expert on security on The Entree produced by CNN.](#)
- [Keynote: The coming decades of BSD](#) EuroBSD 2016
- [Through the Wire: Measurement and Improvement of a software based IPsec implementation, Part II](#) BSDCan 2016
- [Through the Wire: Measurement and Improvement of a software based IPsec implementation](#) AsiaBSD 2016
- [\(D\)Tracing FreeBSD for DevOps and Developers](#) Tutorial at EuroBSDCon 2016

- [A Look Inside FreeBSD with DTrace](#) Tutorial at BSDCan 2016
- [\(D\)Tracing FreeBSD for DevOps and Developers](#) Tutorial at AsiaBSDCon 2016
- [Measure Twice, Code Once:Network Performance Analysis for FreeBSD, Part II](#)
- [Cambridge L41: Teaching Advanced Operating Systems with FreeBSD](#)BSDCan 2015
- [Measure Twice, Code Once:Network Performance Analysis for FreeBSD](#)AsiaBSDCon 2015
- [A Look Inside FreeBSD with DTrace](#) Tutorial at AsiaBSDCon 2015
- [Computers, Clocks and Network Time Everything you never wanted to know about time.](#)FOSDEM 2015
- [Systems, Science, and FreeBSD Talk given at Microsoft Research](#), Cambridge, August 2014
- [Networking from the Bottom Up: Packet Processing Frameworks](#) AsiaBSDCon 2014
- [FUSE and FreeBSD](#) AsiaBSDCon 2012
- [Synchronizing Systems on a LAN: An Introduction to PTPd](#) BSDCan 2011
- [Networking from the Bottom Up: Routing](#)BSDCan 2011
- [Networking from the Bottom Up: IPv6](#) BSDCan 2010
- [Networking from the Bottom Up: Device Drivers](#) BSDCan 2009
- [Thinking about Thinking in Code](#) Keynote BSDCan 2009
- [Multicast Performance in FreeBSD](#) EuroBSD 2008
- [Performance Analysis with HWPMC](#), a tutorial EuroBSD 2008
- Becoming Paranoid for the Cambridge Security Seminar. 24 October 2006. Cambridge University, Cambridge, UK.
- Paranoid University Asia 2006 Tour. 8 Locations in Asia (Mumbai and Bangalore, India; Sydney, Australia; Singapore; Taipei Taiwan, Seoul, Korea; Beijing, China; Hong Kong)
- Paranoid University Europe 2005 Tour. 5 Locations (London, England; Paris and Grenoble, France; Munich and Hamburg, Germany)
- Paranoid University Asia 2005 Tour. 7 Locations (Bangalore, India; Sydney, Australia; Singapore; Taipei Taiwan, Seoul, Korea; Beijing, China; Hong Kong)
- Paranoid University. Yahoo Asia Developers Conference. Fall 2004.
- Deploying and Debugging DHCP. One day tutorial at [LISA 2003](#).
- Deploying and Debugging DHCP. One day tutorial at [APRICOT 2003](#).
- Socket Programming. One day tutorial at [Usenix 2002](#)

## Professional Activities

- Head of ACM Practitioner Board 2014 - 2016.
- Editor in Chief, FreeBSD Journal 2014 - Present.
- Member of the [ACM Queue Magazine](#) Advisory Board. Technical editor for Embedded Systems issue, April 2003
- Core Member of the [FreeBSD Project](#) 2006-2010, 2014-Present.
- Committer to the [FreeBSD Project](#)
- Member of Usenix Association 1990 to present.
- Member of ACM 1993 to present.
- Member of IEEE 2001 to present.

## Education

**Northeastern University** *Boston, Massachusetts*  
Bachelor of Sciences in Computer Science, 1990.

## **Languages**

C, Python, PHP, C++, and many others

## **Systems**

Unix (all flavors); Various Embedded Systems, TCP/IP Internals.