D. Scott Alexander

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General Profile

I am a successful system-builder with over fifteen years experience designing, building, and managing software systems and offer a rare combination of research and practical business experience. I possess the ability to grasp the "big picture" and bring a system from requirements gathering to customer delivery, excellent people skills and outstanding written and oral communications skills.

Professional Experience

Senior Member of Technical Staff, April 2002 – February 2004.
System Detection

System Detection is a network intrusion detection start-up.

Responsible for technology transfer of the proof-of-concept implementation of Columbia University's Unsupervised Probabilistic Anomaly Detector and re-implemented it for the commercial market and adapting and extending it based on results of field trials.

Accomplishments:

- Initial System Detection implementation of UPAD
- Extension to look at independent and dependent features
- Extensions and continuing support in response to the sales team's experience with customers

Chief Architect, Engine Group, July 2000 – February 2002.
Activium

Activium is a privately owned B2B technology start-up developing storage networking management software, founded by a co-founder of Comverse Technology, a $3B, S&P 500 and NASDAQ-100 Index company.

Responsible for merging the ideas and concepts from the University of Pennsylvania SwitchWare project with those of the Columbia University Netscript project to form a coherent system — eXa, positioning that system with features consistent with the market window and market requirements, design of the eXa language runtime system (the eXa engine) with particular emphasis on providing isolation of the compiler from any embedded operating system as well as a variety of target hardware platforms, and development of the first two reference versions under Linux.

Accomplishments:

- Lead development of the prototype of the eXa engine to prove the basic concepts and the first deliverable version of the eXa engine.
- Documented design and implementation of the eXa engine.
- Managed initial contacts with NPU vendors with the goal of joint efforts to port eXa to their platforms.
- Represented company at NPF standards body.
- Supported implementation of demos designed to show system concepts to potential partners and investors.
- Supported marketing efforts to gather marketing requirements and transform them into technical requirements.

Member of Technical Staff, Bell Laboratories, October 1998 – July 2000.
Lucent Technologies

Bell Laboratories is the research arm of Lucent Technologies, a major telecommunications equipment provider. The NEPPI project explored how to apply active networking technology to the enterprise environment by simplifying the principles of active networking to provide flexibility to software developers within network appliance manufacturers.

Responsible for the design of the port of NEPPI to NPU hardware and conducting general networking research.

Accomplishments:

- Designed the port of the NEPPI software to NPU hardware.
- Assisted hardware designer in designing NPU hardware platform that would support NEPPI and provide a level of performance appropriate to the marketplace.
- Researched, designed, and implemented SNMP-based administration tool for NEPPI.

Research Fellow, Distributed Systems Laboratory, August 1995 – October 1998.
University of Pennsylvania

Accomplishments:

- Conducted research as part of the SwitchWare project in the area of active networks with an emphasis on extendibility and flexibility.
- Designed and implemented one of the first active node architectures and implemented it in Caml. The architecture provides the ability to extend the node's functionality via programs loaded from local storage or from the network (via inband or out of band mechanisms).
- Implemented a network bridge for 100 Mb/s Ethernet composed of programs capable of transitioning between spanning tree algorithms in a controlled and reliable manner, demonstrating the utility of the above active node architecture.

Intern, June 1997 – January 1998.
Bell Communications Research

Bell Communications Research (now Telecordia) was a research organization shared by the Bell Operating Companies after the breakup of ATT. It performed research in a broad range of data and voice networking areas.

Responsible for technology transfer between research groups at the University of Pennsylvania and Bellcore. These two groups had a joint DARPA grant for research into active networks. Penn provided a basic infrastructure and Bellcore provided practical networking applications.

Accomplishments:

- Educated Bellcore research group about active networking accomplishments at Penn.
- Educated Penn researchers about active networking applications being proposed by Bellcore.

Technical Group Leader, January 1990 – June 1995.
Jet Propulsion Laboratory

Jet Propulsion Laboratory is a NASA laboratory which focuses on exploration of deep space by unmanned spacecraft. It is run under sole-source contract by Caltech.

Responsible for subgroup performing design, implementation, testing, delivery, and support of the Command subsystem that allows mission control operators to take spacecraft command sets developed by project scientists, reformat them as required, send them to the antenna complex, and arrange for radiation of the commands to the spacecraft. Additionally, the subsystem provides the mission controller the ability to directly build commands in an emergency situation.

Accomplishments:

- Transformed the subsystem from one with low user satisfaction to one with a high level of user buy-in by focusing on user needs and managing user expectations. This was accomplished within the original schedule and budget.
- Educated leaders of new projects about the benefits of using our system (rather than building their own) and how we could customize the system for their requirements within the constraints of our NASA budget.
- Lead a group of users and developers in the design of new graphical user interface that better displays information commonly used by mission controllers.
- Spearheaded the expansion of the testing program for the subsystem to reduce the number of errors discovered in the field.
- Lead team of 4.5 employees and managed $1,000,000 budget.

Member of Technical Staff:

Responsible for redesign and implementation of a system for the translation of commands into binary messages for transmission to spacecraft. The original system had been implemented in assembly on a Modcomp single user computer running a proprietary operating system.

Accomplishments:

- Brought in initial version substantially before due date.
- Established thorough test program to support Voyager project tester.

Research Fellow, Distributed Systems Laboratory, August 1993 – August 1994.
University of Pennsylvania

Accomplishments:

- Investigated layering of IP and TCP over an ATM network.
- Designed and implemented software necessary to connect AIX IP with ATM cards designed at Penn.
- Measured and analyzed performance results.

Systems Programmer, May 1986 – January 1990.
Department of Computer Science, Univ. of PA.

Responsible for primary system support of machines running any variant of Unix. This included all of network administration, system administration, and providing system programming support to faculty and graduate students in support of their research.

Accomplishments:

- Lead the transition of the department from using terminals connected to centralized Vax/VMS servers to using Unix-based workstations with centralized NFS file servers.
- Provided daily system support (backup/restore, operating system updates, package evaluation and installation, etc.) for several departmental laboratories.

Education

University of Pennsylvania, Philadelphia, Pennsylvania
School of Engineering and Applied Science
Ph.D. in Computer and Information Science, December 1998
Dissertation: A Generalized Computing Model of Active Networks
Advisor: Jonathan M. Smith
Awarded Rubinoff Award for innovate applications of computer technology

M.S.E. in Computer and Information Science, August 1994
Dissertation: Embedding High Speed ATM in Unix IP

Rice University, Houston, Texas
B.A. in Computer Science, May 1986.

Selected Publications

Journal Publications

D. Scott Alexander , Paul B. Menage, Angelos D. Keromytis, William A. Arbaugh, Kostas G. Anagnostakis, and Jonathan M. Smith. "The Price of Safety in an Active Network," Journal of Communications and Networks (JCN), special issue on programmable switches and routers, vol. 3, no. 1, pp. 4 – 18, March 2001.

D. Scott Alexander, William A. Arbaugh, Angelos D. Keromytis, Steve Muir, and Jonathan M. Smith. "Secure Quality of Service Handling (SQoSH)," IEEE Communications Magazine, vol. 38, no. 4, pp. 106 – 112, April 2000

D. Scott Alexander, William A. Arbaugh, Angelos D. Keromytis, and Jonathan M. Smith. "Safety and Security of Programmable Network Infrastructures," IEEE Communications Magazine, issue on Programmable Networks, v. 36, no. 10, pp. 84–92.

D. Scott Alexander, William A. Arbaugh, Michael W. Hicks, Pankaj Kakkar, Angelos D. Keromytis, Jonathan T. Moore, Carl A. Gunter, Scott M. Nettles, and Jonathan M. Smith. "The SwitchWare Active Network Architecture," IEEE Network Special Issue on Active and Controllable Networks, v. 12, no. 3, pp. 29–36.

D. Scott Alexander William A. Arbaugh, Angelos D. Keromytis, and Jonathan M. Smith. "A Secure Active Network Architecture: Realization in SwitchWare," IEEE Network Special Issue on Active and Controllable Networks, v. 12, no. 3, pp 37–45.

Book Chapter

D. Scott Alexander, William A. Arbaugh, Angelos D. Keromytis, and Jonathan M. Smith. "Security in Active Networks," *Secure Internet Programming: Security Issues for Mobile and Distributed Objects*, Springer-Verlag Lecture Notes in Computer Science State-of-the-Art series, LNCS 1603, pp. 433–451.

Refereed Conference Publications

D. Scott Alexander and Jonathan M. Smith. "The Architecture of ALIEN," First International Working Conference on Active Networks, (LNCS 1653, pp. 1–12), Berlin, Germany, June/July, 1999.

Michael Hicks, Jonathan T. Moore, D. Scott Alexander, Carl A. Gunter, and Scott M. Nettles. "PLANet: An Active Internetwork," IEEE Infocom '99, New York, New York.

D. Scott Alexander, Marianne Shaw, Scott M. Nettles, and Jonathan M. Smith. "Active Bridging," SIGCOMM '97, Cannes, France, September 1997.

D. Scott Alexander, C. Brendan S. Traw, and Jonathan M. Smith. "Embedding High Speed ATM in Unix IP," Usenix 1994 High-Speed Networking Symposium, Oakland, CA, August 1994.

Other

D. Scott Alexander, Bob Braden, Carl A. Gunter, Alden W. Jackson, Angelos D. Keromytis, Gary J. Minden, and David Wetherall. "Active Network Encapsulation Protocol (ANEP)," Active Networks Group, DARPA Active Networks Project, August 1997.