James E. (Jed) Donnelley

Over twenty five years experience in network programming, integration, operating systems (Unix, Windows, Mac, and in-house), debugging and analysis, research, and management. Strong background in programming (e.g. OS, Web, simulation, etc.) communications (LAN/WAN - e.g. Ethernet, ATM, multicast, etc.) and software (e.g. drivers, TCP/IP, and applications such as Web, telnet, etc.). Excellent problem solving (e.g. debugging and performance tuning) and human communication (e.g. presentations, publications, management, and selling) skills. Recognized at LLNL as an innovative leader, architect, and problem solver.

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PERSONAL 6 feet tall, 175 pounds, excellent health. Born July 5, 1948. Married to Yvonne, daughters Faye (9/90) and Claire (6/92).

PROFESSIONAL AFFILIATIONS ACM since 1973 (Sigs: COMM, OPS, ARCH)
IEEE since 1975

FORMAL EDUCATION Graduate of Palo Alto High School, 1966.
B.A. Physics, B.S. Mathematics 1970, M.S. Mathematics 1972, University of California Davis.
Transcripts available upon request

HONORS Departmental citation for outstanding achievement in undergraduate mathematics from U.C. Davis, 1970.

REFERENCES *Available upon Request*

WORK EXPERIENCE

Summary (most recent first, positions 1-2 and 4-9 were at LLNL):

1. Technology Information Group staff member, July 1996 to present. Webmaster for the Engineering Records Center: http://ercu.llnl.gov/. Reengineered the centers business processes to base electronic transactions on a Web (mostly Netscape) front end and a database (Oracle) back end.

2. Integration team leader for the Scaleable I/O project, April 1995 to July 1996: http://www.llnl.gov/liv_comp/siof/ (also helped with Web work - e.g. the on-line demonstrations for Supercomputer ‘95).

3. Professional research leave to the Communication Systems and BelWü Development group (e.g.: http://www.belwue.de/belwue.html or: http://www-ks.rus.uni-stuttgart.de/csd/csd-belwu.html) at the computer center of the University of Stuttgart, Stuttgart, Germany, April 1994 to April 1995.

4. Gigabit Test Bed manager, Webmaster and staff member of the Advanced Telecommunication Program, June 1990 to April 1994: http://www-atp.llnl.gov/atp/ or the older: http://www-atp.llnl.gov/atp/atp.html

5. Group leader of the operating systems group from April 1988 to June 1990.

6. Technical lead of the Network LTSS distributed operating system project, May 1980 to April 1988.

7. Principal investigator for the Local Network Research project, September 1976 to May 1980.

8. Coprincipal investigator for the Department of Transportation funded Intelligent Gateway Project July 1975 to September 1976.

9. Staff member and ARPA network Technical Liaison for the ARPA funded Research Into the Security of Operating Systems (RISOS) project September 1972 to July 1975.

10. Teaching Assistant for the University of California (Davis Campus) December 1970 to June 1972.

11. Hydrologist for the U.S. Geological Survey (summers) 1968 to 1971.

12. Summer engineering program participant at Hewlett Packard Corporation June to September 1966.

Consulting experience: Aerospace Corporation (Los Angeles), Rockwell International (Los Angeles), EDP Audit Control (Berkeley), American Supercomputer Inc. (Cupertino), Defense Airborne Reconnaissance Office, others. Expert witness for Dietrich, Glasrud and Jones (Fresno).

Teaching experience: Differential equations, calculus, and computer programming, University of California, Davis. Analysis of Hyperchannel, University of Calgary. LLNL in-house courses. High speed networking tutorials.

Overview: Unusual breadth and depth of experience, technical and communication:

1. Technical - developed two OSs (RATS implementation and NLTSS architecture and implementation), parts of three networking protocols (ARPA NCP, in-house "Delta-T", and TCP/IP) and numerous other programming projects (e.g. the current Web/Oracle work in the Engineering Records Center).

2. Management/coordination - Project leader, group leader, technical lead, Cooperative Research and Development Agreement lead, consulting for industry and government, etc.

3. R&D - Operating System security (RISOS), Local Area Network (Local Network Research Project - e.g. Hyperchannel), the Advanced Telecommunications Program - with publications and conference presentations from each.

More detailed (first person) work experience description (historical):

I was honored by Hewlett Packard Corporation with a position in a summer engineering program for promising high school graduates in 1966. In this program I analyzed semiconductor components and studied digital circuits. In the Summers between studies at U.C. Davis I worked as a hydrologist for the U.S. Geological Survey doing surface and ground water hydrology. I obtained early computer experience on the network of IBM 360 computers run by the U.S.G.S.. As a teaching assistant at U.C.Davis I taught differential equations, calculus, and computer programming. When teaching computer programming I brought time sharing into the classroom for the first time at UCD.

In 1972 I joined the staff of the Research Into the Security of Operating Systems (RISOS) project at Lawrence Livermore Laboratory (LLL). This project was supported by the DOD ARPA to discover flaws in computer operating systems and to search for ways to eliminate such flaws in future systems. This work offered tremendous breadth of study in computer systems including: IBM (OS, VS2, VM), Honeywell (GECOS, WWMCCS, and Multics), Univac Exec8, Burrough MCP, and Dec (TENEX, RSX-11M, TOPS-10, Unix). While on the RISOS staff I was technical liaison for LLL to the ARPA network during the pioneering phase of ARPA network development. In this capacity I was the technical interface for the Network Control Program, Telnet, and FTP protocols that were implemented by the RISOS staff for our in-house developed operating system on the ARPA network (RATS). While on the RISOS staff I did research on advanced concepts in operating system design and developed techniques for testing computer software. Much of the development work for this project was done on Unix. The publications in the bibliography 1, 2, 3, 4, 5, and 7 further describe my RISOS work.

During 1975 and 1976 I was co-principal investigator for a contract with the Department of Transportation (DOT) to develop a system (termed a "transaction controller") to simplify, coordinate, and facilitate access by DOT analysts to a distributed transportation database. A prototype system was demonstrated in July 1976 running on a DEC PDP-11/45 computer with auto-dialed telephones and access to Infonet, Tymnet, and ARPA net. This system was the first of a series of Intelligent Gateway Processors (IGPs) that eventually was licensed to Control Data Corporation under the name ASCENT* gateway. Publications 6, 8, and 9 further describe this work. During this period I was also the LLL representative to the Energy Research and Development Administration's network investigators group. Publication 10 further describes this work.

In 1977 I initiated the Local Network Research Project at LLL to study the impact of (then) recent developments in local area network (e.g. broadcast buses and rings). As part of this work I did detailed discrete event simulations of the Network Systems Corporation Hyperchannel product. These simulations pointed out flaws in Hyperchannel that were subsequently corrected. Publications 11 and 12 further describe these studies. I taught 1 week classes related to these studies on Hyperchannel at the University of Calgary, Canada in the summers of 1979 and 1980.

In 1980 (while still at LLL) I began consulting for Aerospace Corporation. I continued consulting for them off and on until 1988. During 1982 and 1983 I served as an expert witness for Dietrich, Glasrud and Jones. During 1986 and 1987 I consulted for Rockwell International. I have often done other occasional consulting over the years. Most recently I have given a tutorial on High Speed Networking in a half day format at Supercomputer '92, at Aptec Computers (Portland, Oregon), and in a full day format at the German Weather Center (DKRZ) in Hamburg, Germany and later (1996) for JASA (below).

Between 1979 and 1990 my work at LLNL was directed to supplying production operating systems and network protocols for the Livermore Computer Center. Anticipating the proliferation of local area networks and workstations during the early 1980s my colleagues and I developed link, network, transport, session, presentation, and application level protocols for the network operating system that I was the technical lead for. This work is further described in publications 13 - 17. As time passed all of these in-house protocols were replaced with emerging standards. For example, we have replaced the Delta-T transport protocol (which I implemented) with TCP (which I also helped to integrate).

In 1984 the scope of my work increased when it was decided to emulate the interface for the existing operating systems on the supercomputers at LLL in order to transit to the new network operating system. About that same time we began work to support shared memory multiprocessing. These changes expanded the project to involve 30-40 people. In 1986 this system began production use. During that time frame my efforts were largely refocused on debugging and improving the performance of this production system.

Early in 1988 I was given the additional assignment of administrative leadership for the operating system group (10 people). In this group leader position I was responsible for further developing and maintaining the distributed operating system for the Livermore Computer Center and insuring that users needs were met. In about 1990 the software systems that were previously developed at LLNL were replaced by vendor supplied systems.

In 1990 I began working as a staff member in the Advanced Telecommunication Program at LLNL. My primary responsibility was managing test bed activities for gigabit networking components. In this role I conducted numerous tests of early release HIPPI prototypes and products and participated in testing of early Fibre Channel products. During this work I worked with a HIPPI tester developed at Los Alamos National Laboratory (and later marketed by what is now called Avaika Networks Corporation) and with a Fibre Channel tester from Finisar Corporation.

As a member of the ATP staff I worked closely with a variety of companies developing and/or selling advanced networking products including Ancor Communications, IBM AWD, Hewlett Packard, Sun Microsystems, Finisar, and many others. I was also involved in testing advanced wide area networking technologies such as ATM in the Xunet (eXperimental University NETwork) collaboration with AT&T (Sanctioned by CNRI as the "Blanca" gigabit test bed), in the Northern California Gigabit network (Bagnet) with Pacific Bell, and others. I participated in commercializing technology developed at LLNL such as advanced frequency and wavelength division multiplexing for very high speed digital communication (> 10 gigabits/sec link speeds).

While working for the ATP I also developed their Web site (e.g. still visible at: http://www-atp.llnl.gov/atp/atp.html) during the early development phase of the Web and continued some communication and Web related activites while on the professional research leave below.

I spent the year from April 1994 to April 1995 on a professional research leave to the Communication Systems and BelWü Development group in the computer

center at the University of Stuttgart, Germany. During this time I helped this group in a variety of areas including:

1. TCP/IP debugging and performance analysis. For example, I discovered a buffering inadequacy in Cisco's support for IP over X.25 that led to substantial packet losses.

2. Participation in demonstrations of applications (e.g. a cooperative visualization and simulation package) over high speed networks (e.g. ATM and SMDS networks at the 1995 InterOp in Paris as part of the Deutsche Telecom booth). I was also involved in a number of "MBone" demonstrations.

3. Presentations and participation in many technology transfer meetings, including:

   a. The presentation "Multifunction LAN Communication" in the session on Ultra High-Speed LAN Technologies at the June 1994 Berlin InterOp:
   http://www-ks.rus.uni-stuttgart.de/atp/talks/berlin-interop.html

   b. SMDS, ATM, and cooperative simulation demonstration in the Deutsche Telecom booth at InterOp in Paris, Fall 1994.

   b. The presentation, "WWW Media Distribution via Hopwise Reliable Multicast" at the April WWW'95 conference in Darmstadt:
   http://www-ks.rus.uni-stuttgart.de/atp/papers/HRM/HRM.html
   This paper is also published in "Computer Networks and ISDN Systems" - see publication 18 below.

During my time in Stuttgart I also supported quite a number of WWW pages, including the moderately popular (~3000 impressions per work day) Computer and Communications pages at:

http://www-atp.llnl.gov/atp/comp-comm.html
(also with mirrors in Germany and Korea - later commercialized to:
http://www.cmpcmm.com/cc/)

In the middle of April 1995 I returned to the Livermore Computer Center at LLNL and began work as the team leader for the integration team in the Scalable I/O project:

http://www.llnl.gov/liv_comp/siof.html

In this work I helped coordinate the low level hardware aspects of this work (e.g. the Network Attached Peripherals, NAPs: http://www.llnl.gov/liv_comp/siof/siof_nap.html with the higher level work such as the MPI-I/O developments: http://www.llnl.gov/liv_comp/siof/siof_mpio.html and the integration into the High Performance Storge System (HPSS: http://www.sdsc.edu/hpss/).

After I completed work for the SIOF demonstration at Supercomputer '95 I began to work on essentially a consulting effort to help select appropriate high performance LAN technologies for the Joint Airborne SIGINT Architecture (JASA) standardization effort within the the Defense Airborne Reconnaissance Office (DARO). Part of this work was making presentations to the JASA organization about high speed networking technologies (e.g.: http://atp.llnl.gov/www/emerg_nets/index.htm). It also involved interaction with the group members on LAN recommendations (e.g. ATM, various Ethernets, Fibre Channel, HIPPI, etc.).

As the JASA work was winding down I was looking for more directly Internet/Web/DBMS oriented work. I want to be able to play a part in the transition to network based electronic commerce. I took on the task of reengineering the Engineering Records Center at LLNL (http://ercu.llnl.gov/) as an example of this transition. To this point (October 1997) I have put into place two parts of this process (number assignment and drawing submission/review) as Common Gateway Interface (CGI) codes between a Web form interface and a database back end (Oracle). There are many aspects of this work including Webmaster (currently of a Netscape Enterprise server), interfacing with the users, some system administration and interfacing to limited external system administration resources, prototype and pilot development (e.g. use of an Entrust Web Certificate Authority as a pilot public key infrastructure), product integration (e.g. advanced scanners and printer/plotters), and of course endless coordination meetings and paperwork (e.g. security plans for the interfaces between the unclassified and the classified parts of the ERC system, coordination of interfaces with the accounting systems at LLNL, design meetings for new aspects of the system, etc.). I am working to help higher level coordination of such work transiting business processes to the Internet/Web around LLNL.

PUBLICATIONS *Reprints available upon Request*

1. J. E. Donnelley, "DCAS" - **A Distributed Capability Access System**, Lawrence Livermore Laboratory Report UCID-16903, August 1975.

2. J. E. Donnelley, **Notes on "RATS" and Capability-List Operating Systems**, Lawrence Livermore Laboratory Report UCID-16903, September 1975.

3. R. P. Abbott, J. E. Donnelley, et. al., **Security Analysis and Enhancement of Computer Operating Systems**, National Bureau of Standards Report NBSIR 76-1041, April 1976.

4. J. E. Donnelley, **Extended Information Formats,** Proceedings of the Berkeley Workshop on Distributed Data Management and Computer Networks, May 1976, pp. 107-113.

5. J. E. Donnelley, **A Distributed Capability Computing System,** Proceedings of the Third International Conference on Computer Communication, August 1976, pp. 432-440.

6. J. E. Donnelley, **Controlling Transactions Between Distributed Computer Resources,** Proceedings of the Fifth Texas Conference on Computing Sciences, October 1976, pp. 48-55.

7. D. Webb, J. E. Donnelley, et. al., **Operating System Security Analysis Handbook**, published by the Lawrence Livermore Laboratory for the National Security Agency, November 1976.

8. E. W. Birss, J. E. Donnelley, and J. W. Yeh, **A Monitor of Distributed Data Systems (MODDS): Part 1, Digest of Functional Specifications**, Lawrence Livermore Laboratory Report UCID-17314 Part 1, November 1976.

9. E. W. Birss, J. E. Donnelley, and J. W. Yeh, **A Monitor of Distributed Data Systems (MODDS): Part 2, Detailed Functional Specifications**, Lawrence Livermore Laboratory Report UCID-17314 Part 2, November 1976.

10. Gerald Estrin, J. E. Donnelley, et. al., **General Purpose Computer Networks and Resource Sharing in ERDA**, Volumes 1-4, published by the Office of Engineering, Mathematical and Geosciences, Division of Basic Energy Sciences, ERDA, July 1977.

11. J. E. Donnelley and J. W. Yeh, **Interaction Between Protocol Levels in a Prioritized CSMA Broadcast Network,** Proceedings of the Third Berkeley Workshop on Distributed Data Management and Computer Networks, August 1978, pp. 123-143. Also in Computer Networks 3 (1979) 9-23.

12. J. E. Donnelley and J. W. Yeh, **Simulation Studies of Round Robin Contention in a Prioritized CSMA Broadcast Network,** Third University of Minnesota Conference on Local Area Networks, October 1978.

13. J. E. Donnelley, **Components of a Network Operating System,** Fourth Conference on Local Networks, Minneapolis, 1979. Also in Computer Networks 3 (1979) 389-399.

14. J. E. Donnelley and J. G. Fletcher, **Resource Access Control in a Network Operating System**, Proceedings of the ACM Pacific '80 Conference, San Francisco, November 1980, pp. 115-125.

15. J. E. Donnelley, **Managing Domains in a Network Operating System**, Proceedings of Local Networks and Distributed Office Systems Conference, London, May 1981, pp. 345-361.

16. J. Minton and J. E. Donnelley, **The Syntax and Semantics of NLTSS Message Tokens**, Lawrence Livermore Laboratory Report UCID-18852, April 1982.

17. J. E. Donnelley, **Support for Parallel Input/Output in Light/ Heavyweight Multiprocessing,** Proceedings of the Cray Users Group Conference, Garmish West Germany, October 1986.

18. J. E. Donnelley, **WWW Media Distribution via Hopwise Reliable Multicast,** in the proceedings of the WWW'95 conference, Darmstadt, Germany, April 1995. Also in Computer Networks and ISDN Systems 27 (1995) 781-768.
http://www.igd.fhg.de/www/www95/papers/87/HRM.html
http://www-atp.llnl.gov/atp/papers/HRM/HRM.html