Mathew P. Bohnsack

3203 Embudito Dr. NE
Albuquerque, NM 87111

505-821-9214 (home)
505-284-1661 (office)
505-803-8220 (mobile)
bohnsack@gmail.com

Education

- **University of New Mexico** — Albuquerque, NM
  Master of Science in Computer Engineering — *September 2011 (expected)*
- **Iowa State University** — Ames, IA
  Bachelor of Science in Electrical Engineering — *May 1997*
- **North Iowa Area Community College** — Mason City, IA
  Associate of Science in Pre-Engineering — *May 1994*

Work Experience

- **Sandia National Laboratories via CDS, Inc.** — Albuquerque, NM
  Sr. Systems Engineer — *July 2008 – present*
  - Conduct day-to-day monitoring, operation, troubleshooting, development, user support, etc. on Red Sky and other HPC platforms.
  - Designed and implemented a 48-node Windows HPC cluster on Sun/Oracle blade hardware.
  - Designed and implemented a 16-node Windows HPC cluster on HP blade hardware.
  - Tech lead of a team of 10 system engineers who designed and implemented the Red Sky supercomputer: #10 on the November 2011 top500 list with 433.5 TFlop/s. 43,008 cores on a 3D torus using QDR InfiniBand.
  - Designed and implemented a large suite of tools used to manage Red Sky.
- **Pay Lynxs, Inc.** — Albuquerque, NM
  Vice President, Development & Implementations — *Nov 2007 - July 2008*
  - Led team of 12 software developers.
  - Designed and implemented SCM processes and infrastructure, with a continuous integration system, automated testing, and daily build and deployment.
  - Conducted database analysis and feature development work with Java, SQL, Perl, Shell, and Ruby.
- **Sandia National Laboratories via CDS, Inc.** — Albuquerque, NM
  Sr. Systems Engineer — *Jan 2003 – Nov 2007*
  - Architecture, development, and implementation of Linux solutions with emphasis on clusters for high performance and scientific computing.
  - Led the implementation of a database-driven web application to simplify and automate various account creation and deactivation tasks.
  - Led the specification and development of a Ruby on Rails web application used to track lab-wide estimated and actual HPC system usage.
  - Lead developer on computing.sandia.gov, a website to bring all laboratory HPC platform information into one place.
  - Led the design, construction, and validation of a 280-node / 1,120 CPU DDR-InfiniBand cluster that saw 10.3 TFlop/s of Linpack performance.
  - Member of the Thunderbird implementation team: #5 on the top500 list - 8,960 compute node CPUs on SDR InfiniBand.
  - Led the design and implementation of a large NIS to LDAP migration.
  - Led the implementation of a Linux cluster with 16 AMD Opteron CPUs and Myrinet 2000 interconnect.
  - Led a team of three developers on an award-winning large-scale dynamic web application used to track classified media. Application built with Perl, HTML::Mason, Apache, and Oracle.
  - Led the implementation of a Linux cluster for the University of New Mexico with 192 PPC970 CPUs using JS20 IBM BladeCenters and Myrinet.

- Designed and led the implementation of a Linux cluster with 256 CPUs, 128 ports of GigE, 128 ports of Myrinet, 10 TB of SAN-connected disk served via GPFS, and a TPeak of 1.5 TFlop/s.
- Supervised the construction of two large data centers.
- Implementation of a 10 TB GPFS storage system with Myrinet, 2 Gb/s Fibre Channel technology, and SATA disks.
- Designed and implemented a 128-node/256-CPU Linux cluster with 2 Gb/s Myrinet interconnect.
- Represented Sandia National Laboratories by participation in the ASCI booth at SC2003.
- Implemented an 8.1 TB GPFS storage system with Myrinet, 2 Gb/s Fibre Channel technology, and Fibre Channel disks.
- Development and deployment of a Condor Pool across more than 300 Linux workstations.
- Designed and implemented a 128-node/256-CPU Linux cluster with 2 Gb/s Myrinet interconnect. Validated system performance by achieving 734.3 GFlop/s in the HPL benchmark.
- Created Sandia-internal web pages for the Infrastructure Computing Systems Department.
- Assisted engineers and scientists in porting their codes to Linux clusters.
- Collaborated in the design and implementation of a 96-port core/edge SAN based on Brocade's 2 Gb/s Fibre Channel technology.
- Designed and implemented the hardware and OS base for a multi-system implementation of SourceForge Enterprise Edition using RedHat Advanced Server 2.1.
- Developed a configurable web-based front-end to PBS and performance monitoring utilities for tracking and recording cluster performance and utilization over time.
- Created health-monitoring scripts that page system administrators when Linux cluster problems are detected.
- Designed, planned, supervised, and implemented a 256-node Linux cluster.

- **International Business Machines (IBM)** Ames, IA (and all over the world)
  Linux Cluster Architect *Feb 2001 – Jan 2003*
  - Architecture, development, and implementation of Linux solutions with emphasis on clusters for high performance/scientific computing and high availability.
  - Created xcat.org as a support site for xCAT users.
  - Contributed code and documentation for xCAT.
  - Did problem determination, developed a fix, and conducted regression tests on a 62-node Linux cluster for Los Alamos National Lab in Los Alamos, New Mexico.
  - Implemented a 32-node cluster with 64 2.4 GHz Pentium Xeon CPUs and Gigabit Ethernet interconnect for Pioneer Hi-Bred in Des Moines, Iowa.
  - Provided Linux cluster consulting to Freddie Mac.
  - Upgrade and customization of 4 clusters with a total of 184 compute nodes for Sandia National Laboratories in Albuquerque, New Mexico.
  - Implemented a 32-node Linux cluster with Myrinet and 600 GB of GPFS storage for the Naval Oceanographic Office at the Stennis Space Center in Mississippi.
  - Designed and implemented a 64-node Linux cluster with Myrinet and 3 TB of storage for Los Alamos National Lab in Los Alamos, New Mexico.
  - Designed and implemented a 32-node Linux cluster with 64 1.4 GHz PIII compute node CPUs, 4 storage nodes with 8 1.4 GHz PIII CPUs, 4 separate networks including Gigabit Ethernet, and 2 TB of Fibre Channel GPFS storage for the University of Notre Dame in South Bend, Indiana.
  - Designed, build, configured, integrated, and tested 8, 16, 32, and 128-node Linux clusters for Sandia National Laboratories in Albuquerque, New Mexico.
  - Developed an internal website for Lucent to track a Linux on S/390 project.
  - Contributed to the development of responses to several large cluster RFPs, including RFPs from a number of National Laboratories.
  - Implemented Apache SSL Proxy customizations for Adventist Health System.
  - Did job scheduler customizations to eliminate user starvation on a cluster for Pioneer Hi-Bred in Des Moines, Iowa.
  - Implemented a 5-node test cluster and upgraded a 32-node cluster to the latest xCAT release for Pearson Technology in Old Tappan, New Jersey.

- Implemented a 64-node cluster for The University of Georgia in Athens, Georgia.
- Did customization work on three clusters at Sandia National Laboratories in Albuquerque, New Mexico.
- Implemented a 32-node cluster for Pioneer Hi-Bred in Des Moines, Iowa.
- Provided consulting and administration services for NCSA on their Platinum and Titan clusters in Champaign, Illinois.
- Taught xCAT classes for cluster administrators and cluster users at Sandia National Laboratories in Albuquerque, New Mexico.
- Upgraded an existing 16-node cluster to 32 Myrinet-connected nodes and an existing 32-node cluster to 48 Myrinet connected nodes for Sandia National Laboratories in Albuquerque, New Mexico.
- Implemented a 216-node cluster for Amgen in Thousand Oaks, California.
- Implemented a 160-node cluster with Myrinet for POSDATA in Seoul, South Korea and achieved 184.4 GFlop/s in the HPL benchmark, ranking it #184 on the November 2001 top500 list.
- Implemented five 16-node clusters and one 32-node cluster for Sandia National Laboratories in Albuquerque, New Mexico.
- Created Linux Cluster Architect training documentation and led the training and certification of IBM architects/engineers in this area.
- Implemented a 19-node cluster for the DOD/airforce in Rochester, Minnesota.
- Trained personnel from WesternGeco on setup and administration of IBM Linux clusters in Houston, Texas.
- Implemented an HA cluster for CreditMinders in Austin, Texas.
- Implemented a 32-node cluster for Pearson Technology in Old Tappan, New Jersey.
- Implemented a 62-node cluster for Structural Bioinformatics in San Diego California.
- Assisted in the implementation of an 80-node cluster the Lawrence Berkeley National Lab in Oakland, California. This was ranked #286 on the June 2001 top500 list.

- **Engineering Animation, Inc. (EAI)** Ames, IA
  Internet Products Manager and Senior Software Engineer *March 1999 – Feb 2001*
  - Technical lead for e-Vis.com, a secure solution for Internet-enabled visual collaboration across the extended enterprise.
  - Ported e-Vis from Linux to HP-UX and Sun platforms.
  - Performed e-Vis internationalization.
  - Instrumental in achieving partnership with Covisint.
  - Managed team of 10 developers.
  - Collaborated with the executive, sales, business development, marketing, and QA departments.
  - Worked on next generation e-Vis architecture for syndication utilizing XML and XML-RPC, while maintaining and furthering development on the existing architecture.
  - Implemented internal version of Bugzilla to track software defects and enhancement requests.
  - Developed a Perl library to programatically access e-Vis functionality. Managed development of tools using this library for monitoring, load testing, and QA on the site.
  - Designed and executed and automated process to deploy and kept current a fleet of Linux demo laptops running the complete e-Vis system.
  - Planned and managed the execution of site maintenance and upgrades.
  - Developed site architecture and managed the implementation of e-Vis datacenter.
  - Developed an automated build system.
  - Setup and administration of CVS system for software revision control.
  - Initial design and development of e-Vis.com.
  - Conducted research on web search engine technologies.
  - Used SWIG on a C++ CORBA library to build a Perl module to extract data from PDM systems.

- **Engineering Animation, Inc. (EAI)** Ames, IA
  Network Engineer, Web Developer, Software Engineer *May 1997 – March 1999*
  - Built a web-based C++/Perl middleware that allowed EAIs visualization software to query and retrieve data from different PDM systems with a consistent interface.

- Design and implementation with emphasis on integration with customers existing data architecture, usability, speed, and security.
- Responsible for enterprise LAN/WAN design, implementation, and monitoring including routers, remote access equipment, leased lines, etc.
- Administration of DNS, NIS, and NNTP services.
- Implemented security measures with firewalls, router filtering, password checking, etc.
- Mentored junior web developers.
- Developed web-based network monitoring tools.
- Build Perl analysis tools for radius log files.
- Developed database-driven dynamic Intranet applications.

Skills

Languages and Programming: C/C++, Java, Perl, Python, PHP, Ruby, Scheme, LaTeX, Shell, SQL, Groovy, HTML, Javascript, MATLAB, git, CVS, SVN, Eclipse, Netbeans.

Operating Systems: Linux (Ubuntu, RedHat, Gentoo), OpenBSD, Solaris, Windows Server 2008 R2

Clustering/HPC: MPI programming, PBS/torque, Maui, slurm, moab, Myrinet, InfiniBand, Windows HPC Server Suite

Database: MySQL, Oracle, PostgreSQL, SQLite

Web: Apache, Apache C/Perl API, HTML::Mason, mod perl, PHP, Ruby on Rails, Struts, Spring, Tomcat, JBoss.

Miscellaneous: Excellent troubleshooting and debugging skills, self-motivated, and highly organized.

Publications

- M. Epperson, J. Naegle, J. Schutt, M. Bohnsack, S. Monk, M. Rajan and D. Doerfler. HPC Top 10 InfiniBand Machine…A 3D Torus IB Interconnect on Red Sky *OpenFabrics Alliance 2010 International Sonoma Workshop*. March 14–17, 2010, Sonoma, CA.
- M. Bohnsack. Red Sky – Pushing Towards Petascale with Commodity Systems *LCI Conference on High Performance Clustered Computing*. March 9–11, 2010, Pittsburgh, PA.

Other

- Active DOE "Q"-level security clearance.
- ITIL Foundation certification.
- Amateur Extra Class amateur radio license.