Mitch Richling
P.O. Box 741203
Dallas, TX 75374
(214)497-1103
http://www.mitchr.me/

High Level Skills

Large Scale Grid Computing Architecture (8 years) Experience designing large scale technical compute grids in a world wide engineering environment (>1M jobs/day, >20K CPUs, 10K engineers, on 5 continents). Proven track record transforming business requirements into real world, best practice driven grid designs that exceed expectations. Significant experience with grid data collection and the development of sophisticated mathematical models to drive higher order understanding of grid environments – yielding real world increases in price/performance ratio. Top level expertise with the practical aspects and architecture of LSF, and some familiarity with Sun GRID – I also have a great working relationship with grid architects at both Platform Computing and Sun Microsystems

Software Development(15 years) Experience with software development best practices, architecting large scale software systems in enterprise environments, and intimate familiarity with software system design (OOP, generic and functional). Expert level experience with standards based, portable software development with C & C++. Considerable experience with system level UNIX programming with C & C++, and UNIX automaton & integration software development (perl, sh, etc.). Experience developing portable, highly technical (image processing, scientific rendering, and numerical analysis) applications and libraries across UNIX, MacOS, and Windows platforms. Good understanding of, and some practical experience with, parallel technologies like OpenMP, MPI, and PVM. Significant experience instrumenting, analyzing, and optimizing performance critical scientific and engineering codes. Fluent with several languages: C (17years), C++ (7y), Perl (10y), Fortran 77 (10y), sh (16yr), and R (4y). Acquainted with many more: Ruby (3y), Common Lisp (10y), Fortran 90 (5y), Pascal, Basic, RPL, csh, Scheme, elisp (10y), Forth, SysRPL, Java, Tcl/Tk, sed, awk, ksh, expect, and python.

Mathematical/Analytical Extensive background in mathematics – more mathematical course work than most university professors. Perhaps even more important, a proven track record making use of that knowledge to deliver real business value in the work place. Significant experience applying advanced statistical, modeling, and simulation techniques to real world IT problems including grid computing, systems benchmarking, capacity planning, and performance analysis. This skill set includes the advanced use of modern statistical analysis software like S-Plus and R, advanced data visualization tools like OpenDX, mathematical modeling with Mathematica and Common Lisp, and advanced numerical analysis programming using tools like GSL, GMP, BLAS, lapack, and linpack.

Leadership & Communication Skills I have good verbal and written communication skills. I have excellent presentation skills, and have the ability to effectively present complex subject matter to both upper management and technical contributors. I have had the opportunity to teach technical and business oriented classes both in academia and the work place. I have a solid track record leading large, distributed technical teams through challenging projects. This includes leading large teams of strong minded, technical leaders in activities like developing cross-organizational standards and deploying those standards across the globe. I have significant experience bringing people together across organizational and cultural boundaries in order to reach alignment over passionate, emotional subject matter. I have extensive experience collecting business requirements and translating them into technical, IT language.

Enterprise UNIX Architecture & Administration(16 years) Experience with designing, implementing, and maintaining UNIX based solutions in large (>40K CPU, >20K user) environment. Intimate knowledge of the physical issues facing large datacenter installations like: power distribution, cooling, floor layout, and air flow. Experience with large (>100PB, >100 filers, >30K automount points) NAS (NFS, CIFS) environments. Experience designing large (>10K port) 10gig Cisco networks for high performance UNIX compute environments. Expert level (16y) experience administering various UNIX platforms (Solaris, Linux, RHEL, SLES, HP/UX, AIX). Deep understanding of TCP/IP networking, TCP/IP protocols (NFS, NIS+, NIS, HTTP, etc...), and advanced IP debugging and packet level analysis. Exposure to a vast array of hardware from large Sun servers and NetApps to x64 clusters. Other topics include: UNIX security, System performance evaluation/tuning, capacity planning, programming/scripting for system administrative tasks.

Experience

Sr. Solution (LSF/UNIX) Architect. Member of Technical Staff Texas Instruments. (2000/6-present)

- Designed & developed a system to collect and analyze >100M data points per day from 40 LSF clusters circling the globe. This system is used to optimize the cost/performance for huge grids, and to drive a cost recovery process for billing $100M of IT equipment to thousands of users.
- Developed a mathematical model describing server utilization levels in the face of changing LSF configurations, and used that model to drive the optimal configuration of things like slot/cpu ratio for 40 LSF clusters world wide – millions of CPU hours saved.
- Lead architect for a distributed team developing a disaster recovery system to protect datacetners located on five different continents (>20K CPUs) – saved millions over conventional designs.
- Technical architect and project manager for a complete redesign of 43 compute clusters (∼15K CPUs on 4 continents). The large, multinational team delivered on this complex objective under budget and on time. The result was increased hardware utilization, lower hardware cost, lower administrative costs, better world wide SC design collaboration, and shorter product design cycles.
- Developed a mathematical model of network traffic produced by LSF compute jobs, and then used that model to design a MAN/LAN supporting a >1K CPU, off-site, grid partition.
- Designed and implemented several integrations between LSF and other IT technologies. For example, played a key roll in the deep LSF/ClearCase integration that is currently considered the best practice solution by Platform Computing. Other examples include the design of a user level checkpoint/restart capability for an EDA simulation tool and a tight FlexLM/LSF integration.
- Numerous UNIX administration automation tasks (C++, C, & Perl). For example, implemented a distributed UNIX, LSF, NIS, and LDAP group management system allowing end users to manage groups and reducing by 50% group related ticket load on global help desks.
- Developed distributed, high performance file system traversal software using C & MPI capable of synchronizing UIDs at a rate of well over 100Tb per hour. Changed the ownership of well over 1 Billion files across hundreds of file servers synchronizing UIDs and data ownership world wide in a matter of hours – all without a single mistake.
- As TI's technical interface to Platform Computing, drove Platform to deliver more new product features in one year than in the 10 year history of the relationship. Helped Platform architect LSF versions fully 10x faster than previous products. Developed a coalition of LSF customers to both share LSF best practices, and to choreograph requests to Platform.
- Used an advanced statistical analysis of the RHEL automounter for use with FlexCache to determine that the design could never meet requirements. The subtle problem would undoubtedly have escaped detection during testing, and would have led to a disastrous, and costly, deployment.
- Part of a core team of IT architects responsible redesigning datacenter networks across TI to increase port capcity and provide 10Gig networking to grid compute nodes and NAS devices.

Programmer/Analyst/System Administer/ Hardwood Products. (1990-present)

- UNIX System administration(Linux & Solaris).
- Development, from requirements to final product, of productivity applications designed to streamline work flows. Examples: inventory control, delivery tracking, and various accounting tasks.
- Assessment of business requirements and acquisition of all IT hardware.
- Analysis and solution of mathematical problems requiring numerical algorithms.

UNIX & LSF Administrator/UNIX Software Developer Ajilon. (1999/8-2000/6)

- UNIX System administration (>5K systems)
- Perl scripting & C programming for automation of UNIX system administration
- Compute cluster capacity planning for a large LSF cluster (∼1K CPU, ∼1K users)
- Implemented automatic data migration for NFS servers, and successfully moved several TB of data without down time.

Graduate RA Mathematics at OSU. (1998-1999/8)

- UNIX System Administration (∼200 systems, ∼500 users).

Graduate TA Mathematics at PSU. (1994-1997)

- System administration of the A&S computer laboratory.

Graduate RA Chemistry at PSU. (summer 1994)

- UNIX system administration(AIX on RS/6k and Solaris on Sparc).

Education

LSF Programming Platform LSF & Extreme Administration Workshop (2006-04)

LSF Platform LSF Extreme Administration Workshop & Programming Platform LSF (2005-04)

LSF Platform LSF Configuration & Advanced Configuration & Administration (2004-07)

PMP Project Management (2003-12)

LSF Advanced LSF Configuration & Administration (2000-9)

LSF LSF Configuration & administration & Advanced LSF Configuration & Administration (1999-11)

PhD Work 2.5 years of mathematics PhD course work and research. GPA 3.8 (1997-1999)

Masters Mathematics from Pittsburg State Univ. GPA 4.0 (1996)

Baccalaureate Math and computer science from Pittsburg State Univ. GPA 3.8 (1994)

Talks

TXN September 2006 at PGC 2006 in San Francisco, CA.
- Title: Exploring Compute Cluster Dynamics Through Simulation

TXN October 2005 at TI headquarters in Dallas, TX.
- Title: Mathematical Risk Assessment and Successful Project Management

TXN December 2004 at TI headquarters in Dallas, TX.
- Title: Successful IT Design Reviews

TXN September 2000 at PUC 2000 in Toronto, Canada.
- Title: The Metamorphosis of an LSF Cluster: A Case Study

OSU Spring 1996 at Oklahoma State University.
- Title:Computational Algebra for Fun and Profit.

MAA Spring 1995 at Southwestern Oklahoma State University.
- Title: Computer aided solution to some topological problems.

KME Spring 1992 at Niagara University.
- Title: General Convex Solid Modeling.

Publications

PGC Proceedings 2006 September 2006
- Exploring Compute Cluster Dynamics Through Simulation
  The use of mathematical simulation and probability theory to avoid IT project failure, manage compute clusters, and optimize grid performance.

PUC 2000 CD September 2000
- The Metamorphosis of an LSF Cluster: A Case Study
  The use of advanced statistical techniques to are discussed which allow for the simulation and analysis of LSF clusters.

The Pentagon Fall 1993
- Title: General Convex Solid Modeling
  A method is discussed to preform normal vector discovery of triangulated 2-manifolds. Software implementing the algorithms is also presented.

Miscellaneous Awards and Honors

Member, Group Technical Staff Elected as a member of technical staff at Texas Instruments. Technical staff is a very selective fellowship of top technical contributors within Texas Instruments.

O.H. Hamlton Given to top graduate student in topology at OSU.

Medenhall Given to top graduating mathematics student at PSU.

KME Paper First place in a national contest (best presentation, paper & original mathematical research).

ΛΣ Selected for membership into national honor society.

KME Selected for membership into mathematics national honor society. Served as chapter president.

ΦκΦ Selected for membership into national honors society.