MICHAEL FENN

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OBJECTIVE:

To use my technical and interpersonal skills to further my goal of being an excellent systems administrator and manager.

EDUCATION:

Clemson, SC **Clemson University** Jan 2009-May 2010
Master of Science, Computer Science

- GPR: 4.00 of 4.00
- Research focus: Grid computing, cloud computing, virtualization
- Master's Thesis: *Practical Implementation of the Virtual Organization Cluster Model*
- Coursework included "kernel hacking" class that investigated the process scheduling, block I/O, and driver portions of the kernel. Culminated in the development of a graphics driver capable of rendering a 3D mesh.

Clemson, SC **Clemson University, Calhoun Honors College** Aug 2005-Dec 2008
Bachelor of Science, Computer Science, Summa cum laude

- Major GPR: 4.00 of 4.00; Overall GPR: 3.92 of 4.00
- Honors Thesis: *A Performance Analysis of Virtual Machine Monitors for use in the Open Science Grid*

WORK EXPERIENCE:

Durham, NC **D. E. Shaw Research, LLC** Mar 2016-Present
Systems Administrator

- Designed and implemented the infrastructure (racks, power delivery), networking, compute, and storage in a new data center "from the floor tiles up" for the purposes of geographical resiliency.
- Planned and executed a migration of multiple petabytes of storage based on Solaris and OmniOS to a highly available system using NetApp Clustered DataONTAP to provide more flexible, reliable, and maintainable storage; improving user productivity and reducing ops time spent on storage support.
- Implemented backend web infrastructure for a custom HTTP-based file system similar to CernVM-FS, including origin web servers, distributed Varnish caches, and client-local disk caches.
- Migrated company from a legacy Jabber-based messaging system to Slack, including utilizing the Slack API for notification of infrastructure events.

Conway, SC **Coastal Carolina University** May 2011-Present
Research Computing Consultant

- Transformed an ad-hoc set of clusters and single nodes into a functioning cyberinfrastructure with centralized DNS, DHCP, Kerberos authentication, LDAP directory services, NFS home directories, SLURM job scheduling, and PXE/Kickstart node provisioning.
- Provided expert-level support for compilation of scientific software packages such as NAMD, NCL, and WRF.
- Advised faculty and staff on hardware acquisitions and upgrades, including several moderately-sized Infiniband and NVIDIA GPU clusters.

- Benchmarked clusters to validate performance against expected baselines and remediated performance issues as necessary.
- Provided technical interface with vendors when diagnosing hardware problems.

Columbia, SC **University of South Carolina** Mar 2015-Mar 2016
Senior Information Resource Consultant

- Planned and executed a SAN migration from a legacy VMAX array hosting VMware vSphere, file services, and Exchange to a multifaceted storage portfolio including EMC XtremIO, VNX, and Isilon. Accomplished with no major downtime.
- Maintained a Cisco UCS environment with policy-based server profiles and templates, enabling rapid configuration of complex host requirements such as multiple NICs on different VLANs, boot from SAN, and customized BIOS settings.
- Developed automated VM deployment methodology using VMware templates and Ansible which reduced deployment effort from dozens of manual steps to several automated ones.
- Developed detailed cost models for virtual hosting and storage services used to inform purchasing decisions and develop sustainable chargeback rates in a large institutional setting.
- Developed dashboards using Grafana and InfluxDB to gather metrics from VMware vSphere and EMC storage array and present key performance indicators to management.
- Developed a modular compute and storage model which streamlined the process of acquiring equipment and provided a corresponding cost model to inform business decisions.
- Remediated Linux hosts with security fixes to establish and maintain PCI compliance.

New York, NY **D. E. Shaw Research, LLC** Aug 2012-Mar 2015
Systems Administrator

- Maintained a global systems and networking infrastructure for a top computational chemistry and molecular dynamics firm.
- Planned and managed a transition of the firm-wide backup infrastructure to IBM Tivoli Storage Manager (TSM) with Space Management and driven by GPFS ILM policies.
- Developed and maintained a configuration management system based on Bcfg2, including defining policies and procedures and on-boarding of technical staff.
- Maintained and extended Ethernet, Fibre Channel, and Infiniband network infrastructure which provides IP, SAN, and RDMA services.
- Planned and managed an OS upgrade from CentOS 5 to CentOS 6. This included upgrading ~3000 machines and ~100 users along with porting and validating ~18,000 custom software modules.
- Managed a multi-PB GPFS installation consisting hardware from SuperMicro, Data Direct Networks, Texas Memory Systems, Brocade, and Force10. Implemented a GPFS Native RAID solution built on GSS with Infiniband interconnect. Managed a zero downtime upgrade of all GPFS NSD servers and underlying storage hardware.
- Maintained several batch processing clusters consisting of over 500 nodes each, some including Infiniband interconnects, which were scheduled with SLURM.
- Developed and maintained a distributed file system architecture based on CernVM-FS and Squid with a single "source of truth."
- Evaluated hardware for performance, reliability, and ease of integration with existing infrastructure.

State College, PA **The Pennsylvania State University** July 2010-Aug 2012
Research Computing and Cyberinfrastructure, Systems Administrator

- Worked effectively as part of a tight-knit team of systems administrators and domain experts that must also interface with a 10,000 employee organization.
- Architected high-performance compute and storage systems with total acquisition costs in excess of $1 million. Deeply involved with the process from conception to design, vendor selection, negotiation, acquisition, and finally implementation.
- Maintained 5+ Red Hat Enterprise Linux HPC clusters that provide batch-level computational resources to researchers. The clusters use the TORQUE PBS batch system along with the Moab scheduler and have Infiniband high speed interconnects. Newer clusters also have Nvidia Tesla GPUs.
- Maintained several Linux interactive visualization clusters that provide access to various scientific and analytical packages such as Abaqus, ANSYS, FLUENT, GAMBIT, Mathematica, MATLAB, R, SAS.
- Maintained a Windows 2008 R2 research computing cluster that provides Remote Desktop Session Host access to scientific applications.
- Maintained a large (raw capacity greater than 1 PB) GPFS file system and a 2.5 PB TSM backup system.
- Developed and maintained monitoring framework utilizing Nagios and Ganglia with custom probes and metrics written in Perl/Python. Framework generates critical performance metrics used for decision-making at the operational and strategic levels.
- Provided support to users for compiling code with GNU, Intel, and PGI compilers as well as maintaining and linking with optimized linear algebra libraries such as ATLAS, GotoBLAS, and Intel MKL.

Clemson, SC **Clemson University, School of Computing** Oct 2007-May 2010
Cyberinfrastructure Research Group, Open Science Grid/Cluster Administrator

- Collaborated with researchers from Brookhaven National Laboratory (BNL) and the Massachusetts Institute of Technology (MIT) to develop requirements for a next-generation batch scheduler designed for use with ephemeral virtual machines.
- Maintained an OSG Compute Element running CentOS (Red Hat Enterprise Linux)
- Maintained a High-Performance Computing Cluster of 26 Linux machines, including dynamically provisioned virtual machines.
- Provided support for the OSG software stack to internal and external users and administrators as a member of the OSG Engagement Virtual Organization.

Aiken, SC **Washington Savannah River Co.** May 2007-Aug 2007
Software Development Intern

- Developed .NET software for WSRC and the Department of Energy.
- Worked with a 10-person team on a ~10,000 line codebase, using source control.
- Reconstituted requirements for DOE software.

RELEVANT SKILLS:

- GNU/Linux, including Red Hat Enterprise Linux, CentOS, Fedora, Ubuntu
- GPFS, ZFS, NFS, Kerberos, LDAP, Ansible, Bcfg2, TORQUE, Moab, SLURM
- Virtualization software, including QEMU-KVM, Xen, VirtualBox, VMware vSphere
- Microsoft Windows 2000/XP/Vista/7, Office 2003/2007, Visual Studio .NET/2005
- Python, Perl w/CGI, Shell scripting, C, C#, PHP, Java, HTML w/CSS
- Open-source development, including code contributions to Bcfg2, MUNGE, pdsh, SLURM, VMware Ruby vSphere Client (rvc), and xCAT
- Condor, Globus, VDT, and other Open Science Grid software
- Linux performance analysis tools such as strace, iostat, vmstat, valgrind

- Debugging network issues using TCPdump, Wireshark, arp, iftop
- EMC storage systems including Isilon, VMAX, VNX, VPLEX, and XtremIO
- NetApp storage systems including ONTAP, SANtricity, FAS8000 series and E-series hardware
- Hardware, including and servers from Cisco, Dell, HP, IBM, and SuperMicro
- Planning data center build-outs incl. power, cooling, and physical space requirements.

SELECTED PUBLICATIONS:

- D.Turner, **M. Fenn**, and M. Murphy. "Pulley: Secure Administration of Virtual and Remote Computing Systems." 52nd ACM Southeast Conference (ACMSE '14), Kennesaw, GA, March 2014.
- **M. Fenn**, S. Goasguen, and J. Lauret. "Contextualization in Practice: The Clemson Experience." 13th International Workshop on Advanced Computing and Analysis Techniques in Physics Research (ACAT 2010), Jaipur, India, February 2010.
- M. Murphy, B. Kagey, **M. Fenn**, and S. Goasguen. "Dynamic Provisioning of Virtual Organization Clusters." 9th IEEE International Symposium on Cluster Computing and the Grid (CCGrid '09), Shanghai, China, May 2009. (21% acceptance rate)
- **M. Fenn**, M. Murphy, and S. Goasguen. "A Study of a KVM-based Cluster for Grid Computing." 47th ACM Southeast Conference (ACMSE '09), Clemson, SC, March 2009.
- **M. Fenn**, M. Murphy, J. Martin, and S. Goasguen. "An Evaluation of KVM for Use in Cloud Computing." 2nd International Conference on the Virtual Computing Initiative (ICVCI '08), RTP, NC, May 2008.