

Hunter Matthews

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Professional Goal

To utilize my knowledge and experience in a small or medium sized team to automate good system administration practice to improve an organizations IT experience.

Technical Expertise

- Computer Languages: Python, shell scripting, C, Hack/HHVM,
- Dev Tools: Jenkins, git, Mercurial, stow, env-modules.
- Operating Systems: Red Hat/Centos Linux, Ubuntu, Opensolaris
- Automation: Saltstack/salt-cloud, Puppet, Packer, Terraform, Chef, Ansible.
- Server Software: consul, VMware(pyvmomi), FreeIPA, Apache, Nginx, Samba, PostgreSQL, Bacula, OpenLDAP, Postfix, MySQL, GPFS, Lustre.
- Deployment: Packer, Red Hat Kickstart, stow, env-modules
- Hardware: Dell Poweredge and Powervault lines, SuperMicro compute and storage.
- Packaging/Updating: yum, RPM, FPM, RHN/Current, python wheels.

Professional Experience

NATIONAL INSTITUTE OF HEALTH, Rockville MD

HPC - Systems Administration

HPC SYSTEMS ADMINISTRATOR

April 2017 - Present

Part of a 5 person team to manage the UNIX based systems within the NHGRI part of NIH. Primary duties have included specialized software building and installation for the HPC clusters and a malware security scanning deployment based on ClamAV (official project #180). Specific accomplishments include:

- Design and rollout of new Salt/Saltstack deployment to replace aging CFEngine setup.
- Monthly maintenance window patching of DMZ systems.
- Script (both shell/BASH and Python) development to support Salt deployment and the ClamAV rollout.
- Early rollout of ClamAV to DMZ hosts to comply with HHS goals.

EXPRESSION ANALYSIS, Durham NC

HPC - Systems Engineering

HPC SYSTEMS ADMINISTRATOR

October 2016 - February 2017

Part of a 4 person team to manage and develop the bioinformatics high performance computing systems and services for a genomics sequencing and analysis business. Primarily responsible for the on-site data center improvements and development of new services housed there. Specific accomplishments include:

- Amazon Web Services (AWS) prototype buildout - participated in all the areas but concentrated on automation with terraform and lifecycle of data from S3 to Glacier.
- Architected build out for in house datacenter - concentrating on new systems and services to accelerate and improve it uses as a center of software development and testing.
- Worked on multiple service automation projects centered around python scripting.
- Performed audit of all SSH host key deployment and re-deployed affected keys.
- Prototyped deployments of consul, Jenkins, and FreeIPA.

FACEBOOK, Menlo Park CA
IT - Platforms Engineering

SYSTEMS ENGINEER

July 2015 - June 2016

Part of a team to provide platforms and support to the rest of Corporate IT. Primarily responsible for automation programming (Python, pyvmomi, git) in longer term projects that have impact across teams. Specific accomplishments include:

- Developed Python automation for automatic VM deployment to new remote sites.
- Wrote HHVM/Python API bridge between production and corporate IP management systems in use by multiple teams.
- Developed Python/Flask automation for user self-service VM creation.
- Maintained Jenkins server for team including packer OS image builds and python tests.

AMAZON, Seattle WA
Amazon Web Services

SYSTEMS ENGINEER

June 2014 - June 2015

Part of the Glacier team, Amazon's archival product. Responsible for both day to day operations and longer term projects to support the automation needs of the product. Specific accomplishments include:

- Worked with a dedicated team automating new public region rollouts of the product worldwide.
- Developed Python software and specifications for proprietary storage hardware including SCSI layouts and system status using open kernel information from sysfs.
- Developed Python automation to take large storage servers out of active rotation, push them through the maintenance cycle for updates and get them back in active service without losing user data or causing outages/performance issues to active regions.

ARGONNE NATIONAL LAB, Argonne IL
Math and Computer Science Division

SENIOR HPC SYSTEMS ADMINISTRATOR

January 2011 - May 2014

Sole administrator for IGSB (30 personnel) with responsibilities for both the MG-RAST and NGS units. MG-RAST is an internationally recognized community genomics tool and NGS is our top tier high throughput sequencing facility. Specific accomplishments include:

- Specified, designed, deployed and operated the computational and storage infrastructure for the MG-RAST system through a period of exponential growth, without a corresponding exponential growth in budget. (Deep stack unix and hardware system administration).
- Diagnosed and resolved performance issues across the entire application stack, including database, storage, application layer, and load balancers.
- Developed infrastructure plan for the NG Sequencing facility, including storage infrastructure, data analysis functions, and archiving.
- Prototyped a next generation infrastructure architecture including use of cloud resources.
- Close to 1PB of storage under management.

HPC SYSTEMS ADMINISTRATOR

October 2008 - January 2011

High performance linux system administrator for a 32 node / 128 core physics cluster and a 250 node / 1000 core biology cluster. Responsible for operations and upgrades to both hardware and software including basic OS and scientific applications. Specific accomplishments include:

- Implemented new 80TB GPFS (IBM) filesystem for the 250 node cluster.
- Participated in a multi-division move to a new building including a new data center.

DUKE UNIVERSITY, Durham, NC

June 1999 - October 2008

Department of Biology

SENIOR SYSTEMS ADMINISTRATOR

Linux and network systems administrator for the Biology department, serving approximately 450 faculty, graduate students, and staff. Responsible for conceiving, designing and implementing new systems and maintaining existing core infrastructure file, database and web servers to computational systems. Specific accomplishments include:

- Designed and implemented a new iSCSI based Storage Area Network to replace all of the department's existing storage servers with fault-tolerant and redundant systems.
- Designer and project manager for a new 300 square foot data center to meet current and future departmental and school requirements with cooling, power, and safety/monitoring systems.

- Consolidated three platform specific backup systems into a single unified backup system with fault reporting.

SYSTEMS ADMINISTRATOR

Solaris and Linux systems administrator for the Biology department, serving approximately 300 faculty, graduate students, and staff. Responsible for systems ranging from core infrastructure file, database and web servers to computational systems. Specific accomplishments include:

- Replaced the existing primarily independent Solaris systems with inter-connected Linux machines.
- Designed and implemented new computational cluster for the department that is compatible with the campus shared cluster.
- Developed requirements, sought buy-in, and designed and implemented new services for trouble tickets, email, web, database, and computational services.
- Worked with other team members to insure seamless operations with both Microsoft Windows and Apple OSX systems to support both teaching and research.

WANG GLOBAL SERVICES, Cary, NC

November 1997 - June 1999

Worldcom FAATSAT contract for the Federal Aviation Administration

SYSTEMS ADMINISTRATOR

- Team lead for 3 system administrators at contract customer site.
- Responsible for day to day tasking and operation of all computers and networking hardware for monitoring the Federal Aviation Administration's satellite network in the 48 contiguous states.
- Developed and deployed new software services and system updates for production level network with hard real time monitoring requirements for life critical communications network.

Education

DURHAM TECHNICAL COMMUNITY COLLEGE

Associates Degree in the College Transfer Program

Business Programming Certificate -- C/C++

NORTH CAROLINA STATE UNIVERSITY

Computer Science major -- Matriculated (junior) before accepting a system administrator position with Wang Global Services working for Worldcom on a Federal Aviation Administration contract.

Scientific Papers (co-authored)

Matthews, H., 2008. Setting up a server room or data center (or data closet) 21st Large Installation System Administration Conference (LISA '07), Book W7.

Wilke, A., Glass, E.M., Bartels, D., Bischof, J., Braithwaite, D., D'Souza, M., Gerlach, W., Harrison, T., Keegan, K., Matthews, H. and Kottmann, R., 2013. A metagenomics portal for a democratized sequencing world. *Methods Enzymol*, 531(487-523), p.31.

Wilke, A., Bischof, J., Harrison, T., Brettin, T., D'Souza, M., Gerlach, W., Matthews, H., Paczian, T., Wilkening, J., Glass, E.M. and Desai, N., 2015. A RESTful API for accessing microbial community data for MG-RAST. *PLoS Comput Biol*, 11(1), p.e1004008.

Vincent, J., Wilke, A., Bischof, J., Desai, N., D'Souza, M., Glass, E., Handley, K., Harrison, T., Howe, A., Keegan, K. and Matthews, H., 2013. Analysis of Shotgun Metagenomes with MG-RAST. *Journal of biomolecular techniques: JBT*, 24(Suppl), p.S20.

Wilke, A., Glass, E.M., Bischof, J., Braithwaite, D., D'Souza, M., Gerlach, W., Harrison, T., Keegan, K., Matthews, H., Paczian, T. and Tang, W., 2014. MG-RAST Manual for version 3.3. 6, revision 9.