

# JOSHUA HOBLITT

Systems Administrator / Network Administrator / Software Engineer

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## WORK EXPERIENCE

**DevOps Engineer** — *Large Synoptic Survey Telescope - Tucson, AZ*

**December 2014 - Present**

**Senior Systems Administrator** — *National Optical Astronomical Observatory - Tucson, AZ*

**October 2011 - December 2014**

I joined the Science Data Management group at NOAO with the goal of modernizing the existing infrastructure with a focus on updating and expanding the storage system(s) which hold the primary NOAO science archive.

- Constructed a small scale HPC system with a 10Gbit/s Ethernet interconnect and a GPFS shared filesystem (62TiB - 108 x 10K RPM HDDs + 12 SSDs) to operate the Dark Energy Survey Community Pipeline
- Migrated NOAO's main science archive holdings from an Xsan/StorNext system to a modern reliable "shared nothing" GPFS cluster (present capacity 1.1PiB) designed for fault tolerance, virtually no downtime maintenance, and to scale into the multi-petabyte range; plus 2 auxiliary (321TiB & 292TiB) GPFS clusters
- Implemented unattended system provisioning with `theforeman` and `puppet`
- Puppetized the majority of the production environment
- Embarked on an aggressive program of retiring aging equipment and consolidating systems (where reasonable) with virtualization
- Proposed and championed a budgeting model where computation, storage, infrastructure, etc. resources are invested in at relatively the same rate each year. Combined with a shift away from per project capital expenditure towards treating IT resources as a common pool, enabled more consistent equipment life cycle management (ie., retirement), and provides a more predictable annual budget request
- Installed comprehensive remote management equipment at an international site, eliminating the need for a dedicated on site FTE

**UNIX Systems Administrator** — *National Solar Observatory - Tucson, AZ*

**June 2010 - December 2011**

My primary task while I was with NSO was to modernize an aging IT infrastructure, which had not had a dedicated systems administrator for several years. The "modernizations" I implemented were wide-ranging from hardware upgrades, such as installing switched PDUs and replacing aging servers with systems that having integrated BMCs, to the installation of monitoring and configuration management systems, such as Nagios and Puppet. My effort was split 50/50 between NSO and NOAO during my transition to NOAO.

- Supported the SOLIS telescope on Kitt Peak and the network of 6 GONG telescopes around the globe
- Added 100s of TiBs of additional storage in the form of 8U custom built NAS boxes
- Took over an aging IT infrastructure and modernized the data center with technologies like vitalization, HA clustering, DRBD, and 10Gbit/s Ethernet
- Standardized the OS image for production servers and scientist desktops to a single Centos 5.x image (kickstarted) and managed via Puppet

**Senior Network Engineer** — *Login, Inc. - Tucson, AZ*

**September 2009 - June 2010**

While at Login, I spent a large percentage of my time managing network equipment, and added Adtran's AOS operating system and Juniper's JUNOS (m20 platform) to my skill base. I also invested time working on Login's ongoing electrical system upgrade to fully convert from a 208V 3PH utility feed to a 480V 3PH feed.

- Managed fiber builds for Metro Optical Ethernet (MOE) installation on client premises
- Managed Asterisk based VOIP services
- Managed customer premises equipment (CPE)
- Scheduled and supervised HVAC, generator, and electrical systems maintenance at a ~ 2,600 sq. ft. data center
- Responded to customer trouble tickets and after hours emergencies

## **Information Technology Specialist** — *Institute for Astronomy, University of Hawai'i - Honolulu, HI* **August 2004 - August 2009**

My time was divided between several different roles: System Programmer for the Pan-STARRS' Image Processing Pipeline (IPP), PS1 Network Work Package Manager (ended in fall 2008), and IPP System Administrator for multiple HPC clusters spread across three different islands. I gained ample experience planning logistics and manpower for network and cluster installations at remote work sites on the summit of Haleakala and at the Maui High Performance Computer Center (MHPCC). My largest single job function was designing and implementing applications in C and Perl to support the IPP; this included formalized systems engineering documentation in LaTeX and Doxygen, a thread-safe reference-counting memory management with back-tracing support, numerous parsers (in C and Perl), a cluster-wide state-keeping work queue system, and a large petabyte-scale storage management system.

- Network “work package manager” for the PS1 project; Designed and installed the network in the PS1 telescope including bringing up both ends of 1Gbit/s connection to Kihei, Maui and deploying an Asterisk PBX
- Responsible for the design and installation of a mixed computation and storage HPC cluster with 0.8 Petabytes of storage
- Participated in the design, documentation and coding of multiple scientific libraries and software implemented largely in C99 by a multiple site team of three to ten members, depending on partner institution staffing levels. The core library is 108K LoC and total internal software tree is 601K LoC (87% C99, 9% Perl)
- Managed ~115 servers
- Build maintainer for 50+ software packages using the “autotools” for C code and `Module::Build` for Perl packages
- Championed bringing test-driven development (or testing at all) into packages written in C via the bundling of `libtap` and a wrapper library of `libtap` that I implemented
- Extensive development of C and Perl applications using MySQL and performance tuning of MySQL installations, including over 5K lines of complex SQL queries and a data set of ~175M rows with the design intended to scale to billions of rows
- Developed a unique user-land object repository (pseudo-filesystem) in C and Perl that's designed to scale to billions of objects (files) with multiple redundant copies of each object distributed across production HPC cluster (managing ~ 3.5PiB as of 2013)
- Developed several RFPs and ran the competitive bidding process for I.T. purchases in the \$200K-\$300K range
- Built and maintained my own custom Gentoo image and ebuilds tree for production servers (built with `catalyst`)

## **Information Technology Specialist** — *Institute for Astronomy, University of Hawai'i - Hilo, HI* **January 2002 - August 2004**

I was responsible for everything from budgeting and purchasing to end-user support. Some of my major projects in Hilo included: implementing a Cisco VOIP network from scratch, deploying Cisco PIXs at three different sites (including two telescopes on Mauna Kea), design and deployment of a multi-terabyte archival system, and overhauling internal security measures.

- Responsible for the Hilo facilities' network, UNIX/Linux servers/workstations, Windows desktops, and the UH88 telescope's network
- Supported ~65 scientists, technical and administrative staff
- Deployed and maintained a Cisco VOIP network in Hilo with ~55 handsets
- Deployed and maintained multiple Cisco PIX firewalls
- Supported telescope operations at 14,000ft.
- Replaced a dozen Cisco 2900s 10/100Mbit/s switches handling desktop connectivity with two Cisco 4000 series switches for a total of ~300 1000BaseT ports so that all physical ports in the building would be live
- Worked with architects to develop data center and network/telecom wiring requirements for a new 20,000 sq. ft. facility
- Developed web apps and data acquisition software for plotting weather data from the UH88's sensor network
- Deployed a building wide WIFI network entire in the plenum space
- Developed the annual Hilo IT budget, in the \$100K-\$200K range
- Hired and mentored a Junior Systems Administrator

## **UNIX Systems Administrator** — *BBox - Beaverton, OR*

**October 2000 - July 2001**

- Responsible for Solaris, Linux, OpenBSD, and NetApp Systems
- Managed network border firewalls, IPSEC VPNs and intrusion detection
- Perl programming for systems administration, internal and external projects
- Consultant to in-house developers for design integration
- Administered DNS both internally and for hosting customers
- On-call 24x7

## **UNIX Systems Administrator (CSci. Dept.)** — *Clark College - Vancouver, WA*

**January 2000 - June 2000**

**Sept. 1998 - Dec. 1999 (student 499 project)**

- Responsible for Solaris, HP-UX, Linux, and OpenBSD systems
- Managed ~2500 user accounts