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Skills

Languages (experienced): C/C++, Python, Bash

Languages (casual familiarity): Java, JavaScript, TypeScript, PHP, Perl, LaTeX, lua, ruby

Frameworks: Boost, Poco, Django, Twisted, various in-house middleware

Operating Systems: Linux, Solaris, BSD, Windows, Pigeon Point RTOS

Linux Distributions: RHEL, Centos, Rocky, SUSE, Fedora, Debian, MontaVista, Ubuntu, CLFS, gentoo

Architectures: x86, x86_64, Intel IXP2800 (ARM), Netronome NFP3200 (ARM), Cavium Octeon I/II (mips64), h8, Microsemi SmartFusion (ARM), Sparc

Linux Subsystems: ethernet drivers, arm arch (adding boards), generic pci devices

Source Control: git, mercurial, svn, cvs

Development Tools: Atlassian Bamboo, Bitbucket, Confluence, and Jira, bitbake, bjam, CMake, conan, ctest, dkms, doxygen, gdb, GitHub, Jenkins, ltrace, make, meson, mockbuild, ninja nose, perf, pylint, rpmbuild, SonarQube, strace, Trac, vtune, WSL

Various Software: ansible, docker, etcd, elasticsearch, kibana, kubernetes, logstash, makeself, pacemaker, redis, zookeeper

Miscellaneous: DevOps practices, strong verbal and written communication skills, performance optimization, micro and macro benchmarking, troubleshooting and debugging skills, exceptional problem solving skills, good teams skills, multi-site experience, large system design

Various Standards: Ethernet (10mb → 40G), IPMI 2.0, PICMG 3.0, VITA 49.0, 49.2, ETSI EN 302 307

Open Source Contributions: ansible, sonar-python, maintained fork of padevchooser

Work Experience

- **Kratos Defense** — Colorado Springs, CO
  Cheetah Team Lead — *October 2018 - Present*
  - Technical Accomplishments
    - Created iovec based Digital IF sockets capable of transmitting or receiving a single stream at 10Gbps
    - Implemented fast float conversion to/from int-8 and int-12 for VITA 49.0 transport
    - Implemented the initial AVX-512 versions of the transmit algorithms for quantumRX
    - Created a multi-threaded, AVX-2 Vitberi decoder for the common CCSDS contraint k=7 Code rate 1/2 that was capable of decoding at information rates over 375Mbps

    - Created AVX-512 versions of DVB-S2 BCH encoders and decoders based on existing C implementations
    - Implemented multiple AVX-512 optimized carrier detection algorithms for various wideband waveforms
    - Implemented a Two Phase Commit protocol for multiple modules to ensure everything was in sync before flowing data
    - Added Jinja2 templated configs to make it simpler to create resuable template patterns
    - Added stacktraces to our in-house exceptions and to our signal handlers for better problem diagnosis from logs when core dumps were not able to get captured.
    - Utilized Intel VTune for branch reduction, loop optimizations, memory read/write reduction, and unneeded copies and zeroization for avarious algorithms
    - Utilized a factory pattern to speed up application startup by 30%
    - Implemented Kratos specific baseband over VITA 49 serializer
    - Implemented baseband L2/L3 serializer and deserializer
  - DevOps Related
    - Helped migrate multiple codebases from subversion to git
    - AWS testing environment stood up using Ansible from scratch as needed to run tests
    - Created product build plans, automated nightly and weekend regression tests, docker containers, and rpm packaging
    - Ensured that warnings were enabled and treated as errors across all shared repositories
    - Setup docker builds and development virtual environment scripts for our in-house Python test framework along with unit test and container build bamboo plans
    - Implemented sonar scans for various C++ and Python projects
    - Added a unit test build for finding memory leaks and overflows using GCC's address sanitizer
    - Migrated build environment to use Conan for consistent 3rd party source management, replacing custom shell scripts and CMake macros
    - Utilized the BFG repo cleaner to remove export restricted content from our main development repository
  - Team Leadership
    - Performed initial customer demos and created initial release of quantumRX
    - Pushed for test driven development, using results from Sonar
    - Pushed usage of Python3 and C++11/14 features across the development organization
    - Ensured better coding practices including removal of bare pointers, removal of code duplication, variable naming, avoiding shadowing, proper encapsulation, and const correctness
    - Helped architect the quantumRX, quantumTX, channelizer, combiner, and diversity combiner products

- **Viavi Solutions** Colorado Springs, CO
  Platform Team Lead *June 2015 - October 2018*
  - Bucharest team
    - Hired an entirely new platform team in the Bucharest, Romania office of Viavi
    - Created technical backlog and architecture for the new team
  - Team Leadership
    - Helped finalize the 1.0 xSIGHT Platform release
    - Drove Platform testing towards automation, consistency, and increased code coverage
    - Successfully instructed team in test driven development methods
    - Took team from being habitually the last team to deliver to consistently being first
    - Pushed Continuous Integration/Continuous Delivery across the product

    - Reduced turn-around time for defects found by test team and field
    - Mentored intern who made direct improvements to product
  - DevOps Related
    - Created simplified distribution mechanism for software and OS updates
    - Took ownership of Ansible based installation; simplifying and making it faster
    - Worked with virtualization team on evaluation of OpenStack, Docker, Kubernetes, including product demos and sample workflows
    - Documented steps to setup kubernetes on Centos 7 in high availability given that no online guide had all the steps required for a fully functioning cluster
    - Utilized Mock for repeatable in-house builds of third party software with few requirements for build servers
    - Setup artifactory for both proxy and storage of local build artifacts including integration with ant, maven, npm, pip, and docker
    - Helped maintain ELK stack at customer installations including streamlining and troubleshooting logstash grok rules and kibana dashboards
    - Helped drive standardized usage of git including branching and pull requests
    - Used Atlassian Bamboo and Jenkins for automated build and testing of platform related code
    - Integrated conan into xSIGHT probe build infrastructure
  - Unified Production OS
    - Automated upgrade from both SLES11 and RHEL6 to RHEL7 with minimal downtime
    - Ported C++ and Python code to newer version of the language for RHEL7 migration
    - Migrated one-off, kernel version dependent device driver builds for napatech, pfring, and dpdk to dkms
    - Migrated various component builds to utilize (newer) libraries provided by OS as much as possible rather than maintaining custom versions
  - Other accomplishements
    - Provided example code for signal safe stacktrace generation used to eliminate 100 GiB core file generation
    - Helped remote team troubleshoot realtime priority inversion and provided code example to do file writes from non-realtime threads
    - Rewrote configuration management application from hand built synchronous sockets to message passing sockets utilizing Python 3's asyncio

- **Tektronix Communications** Plano, TX
  Platform Team Lead *Apr. 2011 - May 2015*
  - Took a leadership roll working with PLM and Architecture teams for entire product life cycle including: scoping, requirements, planning, implementation, and support
  - Designed and developed internal Linux distribution for network monitoring platform
    - Brought together two separate implementations into a single build and installable package
    - Created custom built cross-compilers
    - Every package cross-compiled
    - Scripted remote upgrades from MontaVista 5 to Debian 6, currently in planning phases for migration to Debian 7
    - Included support to netboot 5 different architectures from a single package
  - Integrated applications with pacemaker for fast failover
    - Goal is to have no single point of failure in the chassis
    - Currently supports failover with no interaction

    - Implemented custom resource agents
    - Wrote new STONITH agent to interact directly over IPMB
    - Guided troubleshooting of hardware defect that was initially blamed on cluster software; pacemaker successfully recovered probe in all cases with minimal downtime
  - Probe OAM
    - Maintainer for all OAM tasks for GeoBlade and G-10 hardware
    - Support for automated software and firmware upgrades
    - Standardized interface for alarming, KPI tracking, logging, and task monitoring
  - Board Bringup Tasks
    - Influenced hardware designs both inside the company and with external vendors at all stages of the hardware development cycle including requirements, high level design, component selection, schematic review, and test plan review
    - Worked with hardware team on initial power up of prototypes
    - Customized pigeon point IPMC code for internal designs
    - Integrated vendor's BSP into our internal Linux distribution
    - Wrote custom multi-stage linux based bootloader which was used until U-Boot was ported to that design
    - To support a device with a hardware defect, heavily modified the standard 8250 linux serial port driver to be polled rather than interrupt driven
    - Worked on initial porting of internal Ethernet over PCI bridge driver to new hardware design; helped troubleshoot interrupt handler
    - Modified various Intel ethernet drivers to enable functionality such as flashing the eeprom from linux
    - Registered machine ids with arm.linux.org.uk
  - DevOps
    - Created new packages for release to customer
    - Drove migration to git across the engineering organization
    - Scripted migration for existing svn and cvs repositories to git
    - Worked with SCM team for configuration of Atlassian Stash
    - Implemented build system enhancements and performance improvements
    - Reduced package creation time for probe applications from 30 minutes to under 1
    - Removed obstacles to running unit tests in parallel reducing build times by over 30 minutes
    - Utilized Jenkins and Stash to help catch defects early and provided build checking during the review process
    - Worked with lab team through entire lifecycle of equipment used by the platform team from purchasing to end of life
  - Led and participated in various stages of hiring process for full time, contract, and intern positions including addressing resource shortages, writing job descriptions, reviewing resumes, performing phone screens and panel interviews, and making final hiring decisions

- **Tektronix Communications** Plano, TX
  Software Design Engineer *May 2008 - Apr. 2011*
  - New feature development, sustaining, and third level support
  - Ported software to new architectures and upgraded cross-compilers
  - Diagnosed and fixed kernel bugs impacting the business

- Enhanced various internal and third party Linux device drivers
- Development and maintenance of C++ middleware for GeoProbe product line
- Scripted remote upgrade from MontaVista 4 to MontaVista 5
- Integration of third party software

- **Tektronix** Richardson, TX
  Test Engineer *Jan 2006 - Apr. 2008*
  - Supported major software updates
  - Designed and implemented performance testing metrics
  - Maintained development lab
  - Developed traffic models to simulate customer traffic
  - Implemented company's first automated regression testing tool

Education

- **University of Texas at Dallas** Richardson, TX
  M.A.Sc., Computer Science (GPA: 3.9) *May 2013*
  - Networks and Telecommunications Track
  - Academic Distinction
- **University of Texas at Dallas** Richardson, TX
  BS., Computer Science (GPA: 3.75) *December 2005*
  - Collegium V Honors
  - Magna Cum Laude