

Juliette Attard - Resume

Linux OS Developer with hardware and systems engineering focus

Open to remote roles in the US

Technical Skills

- API generation
- Python flask application development
- Python packaging
- C program debugging and maintenance (cpython, linux kernel, fio, systemd)
- From-scratch operating system build, packaging, testing
- Automated test development
- Linux storage mechanics (scsi/pci-nvme/iSCSI)
- Linux networking diagnostics and management automation (ethtool, ip, bgp, iptables)
- Linux kernel debugging and diagnostics (bpftrace, strace)
- Performance entitlement analysis using fio (flash, networking)
- CI/CD pipelines (jenkins/travis)
- x86 hardware verification and diagnostics

Interpersonal skills

- Mentoring of new hires including new-grads and experienced developers into hardware development and OS development roles
 - Technical training and documentation for developers and support staff
 - Issue triage and backlog management
 - Software feature planning and organization for small and medium size teams (up to 15 members)
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Experience

IBM: Cloud Object Storage Hardware/Linux Engineer

May 2013 - PRESENT

Develop a custom GNU/Linux debian-based operating system "ClevOS" deployed on tens of thousands of storage machines worldwide

Architect, maintain and implement the OS for IBM Cloud Object Storage

- Write and maintain code for OS installation and upgrade
- Write and maintain code for hardware management
- Write and maintain code for network configuration (LACP, 802.Q, BGP, iptables)
- Architect and maintain code for configuration-driven disk, fan, psu, nic, hba monitoring

Maintain Security Posture of all python-packages in ClevOS

- Write and maintain tool that converts [.whl](#) format PyPi packages into [.deb](#) binary debian archives.
 - Uses only PEP specified pip commands
 - Generates all binary packages from source archives
 - Self-building, single-file configuration
 - Automatically identifies debian dependencies via virtualenv integration
 - Elimination and coexistence of all debian-provided sources (no debian code outside of python3.9!)
- Migration of 40 projects to python3
- Manage and resolve issues created by automated scanning tools like dependabot and mend

Hardware lifecycle

- Architect a unittest framework for hardware without access to hardware under test
- Enable testing of devices of devices a decade out of production with the complete set of features supported
- Driver backporting and kernel maintenance to enable new hardware features on stable kernel versions
- Component selection and development of hardware verification procedures for manufacturing

- Working with vendors for components, servers and storage enclosures to identify and resolve firmware and hardware issues identified during development, deployment, and lifecycle (HPE, Cisco, Lenovo, Supermicro, Erricson, Dell/EMC, Seagate, Western Digital)

Open-Source Software Maintenance

- Debug and analysis of kernel/open source library issues through code inspection and system tracing (strace, perf, pdb, and gdb)
- Identify extensions and upstream patches to open source projects and the Linux kernel
- Static compilation of open-source packages for portability

Python Application Performance

- Develop and maintain a framework for identifying timeout conditions for underlying calls in a flask application to "blame" bad hardware
- Develop a caching mechanism for a flask application that is thread-safe, one-memory-copy, and enables HTTP endpoint route caches for simultaneous GET actors (>100% reduction due to CPU savings)
- Use graphviz/cProfile to reduce test application performance by identifying memory copies, and data reorganization

Custom Linux Distribution Development

- Author a tool to generate debian-live images supporting both ubuntu and debian bases
- Developed docker images supporting "build" and "prod" environments
- Generated application mocking frameworks using docker

Hardware Engineering

- Learn and use T10/SCSI Standards (SPC-4, SES-3, SAT, SBC, ZBC) daily to support storage operations and development on SAS and SATA disk drives
 - Use internal IBM standards to develop integration within the IBM storage ecosystem
 - Develop prototype solutions on NVMe platforms, including review of platform compatibility with ZNS
 - Identify critical performance characteristics of new servers, storage enclosures, networking components, drives, and flash through design analysis and empirical verification
 - Port drivers intended for RHEL and other kernel versions to the ClevOS custom kernel
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Education

Illinois Institute of Technology - Master of Computer Science

Chicago, 2013 - 2014

Illinois Institute of Technology - Bachelor of Computer Science

Chicago, 2007 - 2013

Performed research with the Wireless Network and Communications Research Center with focus on data management and systems for managing large scale data generated by radio frequency monitoring

Public Contributions

[systemd — Resolve hardware specific issue resulting in malformed drive VPD](#)

- Identified the path which resulted in drives being recognized incorrectly by udev using strace
- Used SCSI Primary Commands and SCSI ATA Translation standards documents to identify the incorrect assertions made in the underlying utility ata_id
- Performed verification on different SAT implementations across HBA vendors to reproduce and verify the condition

[Linux— Add sysfs attributes for ATA VPD](#)

- Supported the effort of the systemd project to migrate more hardware management functions out of their udev tree and into other distribution packages, as a long-term resolution to the systemd issue with malformed ATA VPD
- Related changes in the sg3-utils package leveraged the VPD attributes for SAS disks, but did not include support for SATA disks
- Introduced a changeset to the SCSI subsystem with the knowledge identified by the fix for ata_id that enables all ATA specific handling to be relegated from udev and the systemd tree

[Linux— Allow non-root users to perform ZBC commands](#)

- Identified that a specific set of system calls being run under non-root accounts were returning -EPERM by using strace
- Inspected the kernel sources for the mechanism by which specific SG_IO commands are allowlisted for use by users based on capability flags
- Extended the list of system calls to include newly introduced ZBC commands under low privilege accounts which have write access

[Patent US11023307B2 — Automatic remediation of distributed storage system node components](#)

- Fleets of hardware in distributed storage networks are typically assembled in multiple locations by hand, and may be modified

- during installation resulting in configuration differences that can impact performance, reliability, or function
- Devised mechanism by which fleets of similar hardware devices could identify nodes that required low-level configuration changes

Patent US10970149B2— Automatic node hardware configuration in a distributed storage system

- Deployments of distributed storage networks at scale typically involve large purchases of similar hardware and knowledge about previously deployments can provide information about new devices
- Devised mechanism by which device configuration could be determined by pre-existing members of a deployment to prevent operators from being required to intervene, in order to ensure a homogenous system for performance and maintenance