

# QIYUAN PU

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## 🎓 EDUCATIONAL BACKGROUND

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**Southwest Forestry University**, Kunming, Yunnan

2014 – 2018

*Bachelor Computer Science and Technology*

## 👤 WORK EXPERIENCE

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**NSFOCUS** Chengdu

2018-6 – 2020-3

*Kernel Development Engineer*

Responsible for porting the DPI (Deep Packet Inspection) framework to domestic platforms such as Shenwei, Phytium, and Loongson. Also responsible for addressing Linux kernel issues.

- Developed assembly code to port DPI software to platforms such as Shenwei, Phytium, and Loongson.
- Handled kernel crash issues.
- Ported security department's Python code to C and optimized it to improve performance.

**UnionTech** Chengdu

2020-3 – 2021-3

*Kernel Development Engineer*

Responsible for addressing Linux kernel issues. Ported the Golang compiler to Shenwei and LoongArch platforms.

- Handled various issues exposed during kernel testing using the LTP (Linux Test Project) test suite, involving analysis of different kernel modules.
- Collaborated with Shenwei and Loongson to port the Golang compiler.

**Loongson** Beijing

2021-3 – 2023-3

*Kernel Development Engineer*

Responsible for resolving kernel performance and stability issues on LoongArch servers, developing new kernel features, and debugging firmware ACPI tables.

- Fixed issues exposed during kernel testing with various test suites, such as LTP and LTPstress.
- Fixed kernel dirty page loss issues caused by improper pte flag operations in the mm module.
- Refactored the pte flag attribute operation interface on the LoongArch platform.
- Analyzed the impact of various I/O schedulers on desktop system interactivity.
- Troubleshoot hardware issues with the chipset that caused the NVMe driver to report I/O timeouts.
- Fixed the crash issue caused by PCI scan scanning all spaces.
- Optimized UnixBench performance on the LoongArch server platform and wrote over 300 lines of kernel common code.
- Analyzed the kernel network protocol stack and resolved customer network latency issues.
- Optimized file operation performance, benchmarking against the Kunpeng 920.
- Developed kernel test automation bash scripts to improve efficiency.
- Debugged ACPI table operations on hardware.

**EasyStack** Chengdu

2023-3 – Present

*Kernel Development Engineer*

Responsible for handling various kernel crash and vmcore issues. Troubleshoot systemd, udevd, and other system daemon problems. Managed upstream patch backporting and kernel maintenance.

- Fixed system deadlock (AA deadlock) caused by rq lock.
- Troubleshoot CPU core-level bugs in domestic CPUs that caused core hang (non-responsive to IPI).
- Analyzed Intel CPU core-level bugs that caused bit flipping in CPU access to virtual addresses.
- Conducted a walk-through analysis of the kernel's qspinlock code.
- Fixed a bug in the vhost module that caused memory corruption, leading to kernel crashes.
- Resolved the issue of multiple processes deadlocking each other in the system.
- Analyzed the systemd code to understand the process of loading, adding, and executing a unit. This was done to troubleshoot the issue where the boot.mount unit was randomly deleted at a lower priority, causing the boot partition to disappear.
- Conducted a walk-through of the QEMU/KVM virtual machine live migration code, and optimized parameters to improve virtual machine migration performance.
- Handled various kernel issues and gained extensive experience in kernel troubleshooting. Proficient in using crash to analyze vmcore dumps, disassembling/assembling code, and debugging the kernel with tools like kprobe and stap scripts. Kernel stack tracing and related tasks are part of the daily routine. Due to the wide range of kernel faults encountered, which can originate from any kernel module, I am able to quickly analyze and walk through unfamiliar modules' code to resolve issues effectively.

## **i** OTHERS

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- School-level "Excellent Student" for the 2014-2015 academic year.
- School-level "Excellent Student" for the 2015-2016 academic year.
- Outstanding Graduate.
- Outstanding Graduation Thesis: Implementation of a Simple Operating System.
- Second Prize in the 2018 Yunnan Province University Student Computer Works Competition.
- Fluent in English reading, with a CET-6 level certification. Holds a patent for "A Method, Device, Electronic Equipment, and Process for Process Access."