

Rahul Rai

Profile

- ★ Can do from scratch - Systems | Ultra Low latency | Kernel (NT & Linux) | Storage | Distributed Algorithms | Security | Performance | HFT | ML.
- ★ I am interested in solving harder problems in CS and finance around Deep Learning, Hardware-Software Interfaces, Distributed Systems, File Systems, CPU boundaries, while writing maintainable/clean SW.
- ★ Can code from ground up in Kernel/User land of either or both Linux and Windows. Has written, debugged, refactored, improved performance of large &/| old codebases.

EXPERIENCE

Standard Chartered, Developer : May 2019 - PRESENT

Systems Programming, message routing queues in both H/W and S/W, Low level drill down on code path, C++ 17, C, Financial Markets, thread sync/async, kernel bypassing.

- ★ Lowered memory overhead by half, latency by an order of magnitude for numerical libraries. Demonstrated false sharing, not just speculation.
- ★ Being the first hire, was also responsible for logistics, training, travel, hiring, set up of end to end source flow, builds, tests, code guidelines, tests, layout.
- ★ Used modern C++ constructs, ebpf, 0 copy, tool chains, modular, maintainable; not just syntax changes using new C++ constructs.
- ★ Challenging limits of multiprocessor synchronization, atomic, no overhead serialization, small string optimizations, alignment of data.

Oracle, Software Developer 2 : July 2015 - Dec 2018

Data Replication : Device Drivers in Linux Kernel from scratch, HLDs from scratch, LLDs from scratch, True async design from scratch, actual deep down scalability_in terms of I/O, memory, vCPU_ of modules (not just adding a caching/redirection/streaming tool)

- ★ Agile development, design and ownership, of the kernel module and of the user space app, in the LINUX BLOCK layer - On the data path/request queues.
- ★ Code from 0, with pre coding of unit tests, evaluate designs, design user space, code kernel mode components for replication across data center/ cloud instances, vm migrations, helped others for orchestration.
- ★ The component comes in the data path pipeline, and causes all other depending consumers to proceed asynchronously, while maintaining data integrity.
- ★ Multi threading in user space app, ioctls, file system operations, persistence.
- ★ BDD, and benchmark asynchronous (not glibc aio -now called io_uring-) I/O, comparison of I/O schedulers, scaling multi-threaded memory management.
- ★ Boot Up of drivers, udev, virtualization, micro benchmarking, threading and socket programming.
- ★ Mirroring agent using RAID and linear devices - Persistent metadata across reboots.

SKILLS

C, C++, C++17/11, unit tests, code reviews, maintainable & robust code.

High Frequency Trading, Forex, low latency I/O, ultra low latency, Numerical Methods, numa, multi core/multi socket CPU, cache aware code. Exchange Connetvity, STL, boost.

SAN, SCSI, Replication, Virtualization, distributed storage, file systems

System Programming in Linux & Windows, Win32, posix, secure, Linux kernel, NT Kernel, Linux Device Drivers, kvm, async I/O, openmp, cuda.

gdb, windbg, kgdb, clang/llvm/gcc toolchains, g micro benchmark, coverity, ebpf, fio, flame graphs, UML, perf, kvm, message queues.

Python, R, rust, go, shell, design patterns, HLD, High Scalability

iGATE, Mumbai— Senior Software Engineer : May 2012 - June 2015

Protocol Development in Windows Kernel

- ★ SAN protocol for EMC2 – Windows driver ioctls to report throughput of FC, FCOE, ISCSI, SAS, and RAID. – catered to the requirements of the entire protocol team
- ★ Triage Tool Development
- ★ Analytics on unstructured log files generated by storage arrays; logs were used by support engineering teams to dispatch the defect tickets; results of the scripts were studied by teams designing the map reduce jobs; process to present failure class by sustenance teams got faster.
- ★ Softphone Software Adapters
- ★ Designed control for channeling requests between softphones (s) and headsets; Interaction between SF’s SDK & Headset’s HID interfaces need to be in resonance. The adapter made calling a seamless experience.

Cisco, Contract Software Engineer : Dec 2018 - May 2019

Training, Solutions, Proposals, speed up – short term fixed role

Hired for features, provide solutions/consulting for SDN/SDS, virtualization.

Modernized modules in the code base, independently learned containers, distributed systems.

EDUCATION

Advanced Computing Training School/CDAC– Diploma in System Software Development

September 2011 - March 2012, Bangalore

Training/Coursework had modules on, but not limited to, high performance computing, multithreading, network analysis, Operating Systems Internals.

BHABHA INSTITUTE OF TECHNOLOGY/UPTU– Bachelors in Computer Science and Engineering

August 2007 - August 2011 , Kanpur

Certifications

Rice University on Coursera Platform July 2018

Parallel, Concurrent, and Distributed Programming in Java

<https://www.coursera.org/account/accomplishments/specialization/EGYMW8TMD38Y>

EMC Data Science
March 2014

<https://www.youracclaim.com/badges/93bd2c91-dccc-464d-8ad8-56ac048776bf>

EMC Data Lakes for Big Data - ETE-BD101 June 2015

<https://educast.emc.com/verify/ICFvbSdt>

