Dale Rahn

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Qualifications Summary

Software engineering developer experienced in working in large corporations and small companies with small and large teams. Acted as primary contact between corporate departments. Significant experience working with external companies. Extensive experience in:

- Debugging/Bring-up on many architectures
- Simulation/Virtual environments: processor, device modeling
- System/Project Architect
- Device driver development
- C, Go, C++, Python, ksh, Rust; ARM, PowerPC, x86, SH assembly
- Embedded Software
- BSD/Linux/Solaris/AIX
- Mentoring/Leadership
- Git, CVS, Subversion, ClearCase, Perforce
- Scrum

Experience Highlights

Software Development

- Created boot loader ROM for emulation environment to validate ASIC boot flow.
- CPU Performance validation, working closely with design and verification teams to confirm the CPU/bus/DDR performance.
- CPU functional debug and validation in Linux and bare-metal test environments on emulation, Veloce and FPGA, as well as ASIC.
- Porting OpenBSD to many different platforms and architectures: AARCH64 (arm64), PowerPC64 userland, RISCV64, PowerPC; ARM32 systems: StrongARM, pxa270, IOP i80xxx; SuperH: sh4.
- Btcd Developer, a reimplementation of bitcoin protocols and applications in Go(golang).
- Architect, and lead developer for Cyphertite backup tool and back end server.
- Device driver development on multiple architectures: OpenBSD, Linux, AIX.
- LINUX development, WiMax driver modification, CRAMFS configuration, system builds.
- Maintained and developed compiler, linker and dynamic linker tools.
- Headed team to develop ARM710 based PDA simulation: ARM7 core, UARTs, touchscreen, display. All necessary devices for running target embedded OS were simulated. Added ARM11 features later.
- Merged standalone DSP simulations (56k, StarCore) into MOOSE simulation environment, placed phone calls using L1 data with simulation running code on both AP and BP.

Employment History

Senior Staff Software Engineer, Qualcomm Inc, San Diego CA, Austin TX 2016-Present

Software Engineer/Architect, Conformal Systems, Chicago, IL 2010-2014

Senior OpenBSD developer, www.openbsd.org, 1995-2012,2017-Present

Software Engineer, Australian Semiconductor Technology Comp., Champaign, IL, 2008-2010

Principal Staff Engineer, Mobile Devices Sector, Motorola Inc, Champaign, IL, 2004-2007

Systems Programmer, University of Pennsylvania, Distributed Systems Lab 2001-2003

Software Engineer, Motorola Inc, Urbana, IL 1993-2001

Education

Purdue University, West Lafayette, IN – Bachelors in Computer Science, School of Science 1993

Detailed History

Qualcomm March 2016 – Present

Silicon Verification pre and post silicon for Snapdragon 835 to Snapdragon 8 Gen2. Created test ROMs to enable full boot testing in emulation environment prior to ASIC ROM availability. Validated new emulation systems prior to release into production. Worked closely with CPU design performance and NOC teams to validate memory latency and bandwidth using software timing and waveform analysis. Found and wrote specific test cases for several RTL failures so that the fixed RTL could be retested.

OpenBSD Developer Feb 2017 – Present

Contributed AARCH64 (arm64) port, wrote POWERPC64 userland code, stabilized and integrated RISCV64 port.

Bitrig Developer Febuary 2012 – 2017

Developed port of Bitrig to run on arm64, system was able to self host.

Lead effort to bring Clang(LLVM) into base system and switching default compiler to Clang.

Conformal Systems, January 2010 – August 2014

Contributed to the btcd (bitcoin deamon developed in go), prototyped the block chain download/server code and script validation engine.

Transformed epitome (dedup backup tool) into the Cyphertite application. Scaled project from single developer up to team over 9 developers, maintained product to end of life.

Designed the Cyphertite server architecture (closed source) and led it's development.

OpenBSD Developer December 1995 – February 2012

Port Maintainer for PowerPC: macppc; ARM32: cats, zaurus, armish, and beagle platforms.

Wrote and maintained numerous device drivers, dynamic linker, compiler/assembler/linker, VM subsystem, numerious platform bring ups, performance measuring and improvement.

ASTC Australian Semiconductor Technology Company January 2008- January 2010

Simulation development, integration of System C peripheral models into the existing MOOSE simulation environment. Adapted QEMU processor model as an alternative CPU core for an ASTC simulation environment. Peripheral development, including graphics interfaces and SDMMC peripherals.

Motorola Mobile Devices Sector, Technology Office October 2004-August 2007

Worked with Future Wireless Mobile Group (WiMax), porting the Linux based WiMax driver to an embedded OS: MAPAL/TTPCom, Additionally performed maintenance work on the Linux driver and the associated debug software and flash tools. Trained coworkers on use of prototype boards.

Lead Engineer in UI Prototyping group. Implemented a desktop and hand-held version of a UI specification in a rapid prototyping environment in Qt to test and improve the UI design.

Worked with Skype, used their voice engine stack along with their embedded interface to build a Qt based application to run on a Linux-based WiFi enabled phone.

Ported Microsoft DRM to Linux/ARM for a DLNA (Digital Living Network Alliance) demonstration.

Assisted simulation group by adding ARM11 features (core specific and floating point) to ARM simulation, also simulation model debugging and maintenance.

Ported OpenBSD to PXA270, Freescale MXC, and OMAP chipsets as potential phone platform.

Resident UNIX/BSD/Linux triaging triaging bugs reported against the embedded Linux environment to determine if they were Linux/OS errors or user errors.

University of Pennsylvania, Distributed Systems Lab September 2001- November 2003

This position was funded by the POSSE DARPA grant to OpenBSD.

Implemented dynamic linker and compiler/linker changes to allow W^X (Write xor eXecute) support for several OpenBSD platforms, i386/amd64/sparc/sparc64.

Updated OpenBSD/i386 to newer compiler/linker tool chain, moving it from the old a.out executable format to the now ubiquitious ELF executable format, with custom memory map to enable W^X security feature.

Rewrote PowerPC virtual memory management code to optimize/simplify it. System build time reduced 20% as a result of the rewrite, some specific benchmark tasks increased in speed by 700%

Motorola Mobile Devices Sector, Simulation Team June 1997 – September 2001

Simulation modeling and core development. Developed an ARM710 CPU model and headed team which developed all peripherals for a phone device.

Developed technique to efficiently simulate a CPU which runs a different endian than the host.

Motorola Computer Group, AIX Fault Tolerant development, Feb 1996 – June 1997

Developed IOFixup device driver for fault tolerant AIX system to detect if an IO error occurred while talking to a peripheral device, giving the system a chance to recover from device failure.

Motorola Computer Group, Languages and Tools, June 1993 – February 1996

Maintained existing SVR4 assembler, linker and compiler front end.

Performed compiler and system benchmarking to compare m88k SVR3/4 systems to other SVR4/UNIX systems available in the market.