Kathy Kerby

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KEY QUALIFICATIONS

Senior embedded systems programmer (Linux, VxWorks, C/C++) with expertise in Internet protocols (TCP/IP, BGP, RIP, RTP). Deep experience with wireless mesh routing. Team leadership experience.

PROFESSIONAL EXPERIENCE

128 Technologies, Burlington, MA   2017 - 2018
Senior Software Engineer, Routing Group

- Developed and maintained protocol to exchange metadata used by 128 Technologies' proprietary secure vector routing (SVR). Enhanced Open Source Free Range Routing (FRR) code base, diagnosed and fixed bugs.

Fortress Technologies / General Dynamics, Westford / Dedham, MA   2006 - 2016
Senior Principal Software Engineer / Lead Engineer

- Project Leader (2 - 4 person team) implementing mobile ad-hoc network routing (mesh) for next generation Fortress Wireless Security Switch (3 releases).
  - Designed and implemented full support for non-mesh nodes to connect through the Fortress Mesh
  - Optimized and reduced inherently non-scalable multicast and broadcast traffic through the Mesh using distributed database facility to carry information in routing control packets
  - Provided near-zero configuration by deriving dynamic configuration values using detected network attributes
- Worked with management to develop Agile (Scrum) practices. Champion of unit testing to drive software development.
- Responsible for stability and performance of mesh routing, Atheros wireless and Ethernet wired drivers, core system functionality. Developed 4x performance improvement to inter-process communication.
- Primary technical point of contact for integration and management of third-party mesh networking library featuring a combination reactive and proactive mesh routing protocol designed to provide high scalability and rapid convergence in highly mobile wireless environments
- Led design and implementation of wireless integration with 3G network for Smart Grid project. Fortress's wireless mesh served as backup when the 3G link was unavailable.
- Led performance and scalability efforts for multiple deployment scenarios for potential customers
- Added IPv6 capability to Fortress Wireless Security Gateway. Patched Linux kernel to eliminate IPv6 denial of service issue.
- Designed and implemented FIPS security module to verify integrity of the cryptographic software and hardware.

Cisco Systems, Boxborough, MA   2005 - 2006
Senior Software Engineer

- Designed and implemented RTP solution for broadcast IPTV implementation
- Worked with Cisco IETF representatives to fine-tune signaling for rapid channel changes in draft RTP RFC

Quarry Technologies, Burlington, MA   2000 - 2005
Routing Team Lead

- Team leader for routing projects. Technical supervisor for team of four developers. Responsible for design, coordination with other teams, project management, and implementation.
  Major Team Projects:
- ECMP (load-balancing) for Label Switch Interface with third-party (Data Connection, Ltd, DCL) LDP software
- Virtual Router interconnects
- Link Table Manager rewrite
- Static route, BGP, and RIP enhancements
- Tapped for crisis projects and bug fixes:

- Received bonuses and commendations on two occasions for fixing critical performance and interoperability issues during VIP prospect trials.
- Implemented Cisco-compliant administrative distances (including EBGP / IBGP) to meet critical customer priority delivery date.

Senior Software Engineer
- Responsible for BGP and the routing database (FIB/FDB), adapted from third-party (Phase II) codebase.
- Rewrote FDBM module to handle flow control for all routing protocols, and to compress operations requests to avoid using infinite resources.
- Designed and implemented a complex Finite State Machine (FSM) to be understandable, maintainable, and extensible for new features.
- Implemented new features including ECMP routes, priority queueing, different route owners.
- Improved BGP performance by tuning ordering of operations and timing of processor yielding. Implemented enhancements to BGP: RIB buffer usage, route clean-up on protocol deactivation.
- Implemented routing policy (access lists, route maps, BGP AS-path access lists, prefix lists, redistribution) based on and extending third-party (Phase II) software.
- Modified Patricia trie BMP search algorithm (Phase II) to allow options: find specific owner; ignore 32-bit local routes; consider state of route.
- Integrated third-party (DCL) MPLS – LDP software, including implementing a hierarchical finite state machine for the Label Switch Interface to our existing FIB.

BBN Systems and Technologies, Cambridge, MA   1994 - 1995
Senior Software Developer - Education Group
- Ported and customized TACACS implementation in C for Unix-based K-12 Internet Server.
- Integrated access control system with Oracle user and policy database.
- Developed user registration system in Perl interfacing to Oracle database.

BBN Communications Corporation, Cambridge, MA   1984 - 1994
Senior Software Developer - Internet Router Group
- Consulted on IP routing and IP Type of Service to other projects requiring in-depth knowledge of EGP, BGP and BBN's IGP (SPF) protocol.
- Designed, implemented and tested proprietary inter-board (960-to-960) communications protocol.
- Ported C language IP router code from M68020-based system to Intel-based multiprocessor router. Resolved 'endian' and other hardware-specific issues.
- Developed SNMP MIB II and MIB I modules.
- Designed, implemented and tested new routing and proprietary trunk protocol for mobile router, including self-configuration and "private net" features.
- Ported PPP and proprietary trunk protocols from experimental router.

Software Developer - Network Management System Group
- Member of task force designing next-generation monitoring system, focused on design of statistics collection and reporting for network devices.
- Implemented X.409-based host usage data collection system.

Harvard University Office for Information Technology, Cambridge, MA   1979 - 1984
Senior Programmer Analyst
- Designed and implemented major systems in COBOL, IBM Assembler, PL/I, IDMS, and ADS/Online.

EDUCATION

Harvard University, Applied Mathematics courses
Cornell University, M. A.
Oberlin College, B. A.