Daniel W. McRobb

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Professional Experience

21 years professional software development: 15 years in network management and measurement software, 6 years in embedded software.

Lear Corporation via MicroMax and Danlaw December 2008 - current
Senior Software Engineer

EVSE: Sole developer of software for all 2012 and 2013 Lear EVSE: custom bootloader, applications (12 variants) and diagnostics. Developed custom protocol and PC-based GUI application to communicate with bootloader over EVSE pilot line for reflashing, fault log retrieval and software identification. Developed diagnostic display on limited-function display on my own time, in the interest of greatly reducing the man hours required for design and production validation. Prepared all documentation required for UL1998 certification (risk analysis, architecture document, etc.). Developed the software validation test plan. Provided input to hardware design. Currently working on ground-up implementation of end-of-line testing (on both sides: the EVSE and the EOL tester) to increase production rate for 2013 model year.

2011 Chevy Volt on-board battery charger: Developed the bootloader and application for one of the three microcontrollers in the 2011 Chevy Volt's on-board high voltage battery charger. Designed the messaging protocol (running over SPI) used between all of the microcontrollers. Implemented the messaging protocol on two of the three microcontrollers.

2013 Smart EV battery charger: Designed and implemented the bootloader for two of the three microcontrollers (Freescale S12P family). This was a tight deadline project. I delivered the code and documentation in 9 working days.

Arbor Networks September 2004 - October 2008
Senior Software Engineer

Addressed scaling issues in Arbor's SP (Service Provider) software suite (a NetFlow-based system). Introduced C++ and CORBA to the system (migrating away from CGI for middleware). Helped port the system from OpenBSD 2.8/3.3 to OpenBSD 3.6 with SMP. Updated the toolchain to gcc 3.4.3 (from gcc 2.95). Removed bottlenecks in distributed messaging and relational database transactions. Integrated sFlow as a data source.

Trendium April 2004 - June 2004
System Programmer

Helped port Trendium ServicePATH product to Linux from Solaris. Project completed at the end of June 2004.

Ixia 2002 - 2004
Chief Architect, NetOps

Chief architect of NetOps suite. Continued work on NetFlow and BGP-4; Caimis was acquired by Ixia in late 2001, renaming the product suite `IxTraffic`. Helped develop reporting GUI for `IxTraffic` using java and CORBA. Implemented compressed storage of raw NetFlow data for detailed accounting. Improved performance of BGP-4 implementation in `IxTraffic`. Added new types of aggregate data to `IxTraffic`. Started design and implementation of configuration system for all Ixia products, using XML Schema and DOM (using `Xerces` from the apache group).

Caimis 2001

Co-founder, Chief Architect

Developed systems for collecting and correlating NetFlow data from Cisco and Juniper routers with BGP-4 data for the purpose of traffic engineering in large networks. Developed modern BGP-4 implementation (C++, multithreaded) for passive monitoring of BGP-4 from any number of peers. Used CORBA as the middleware, permitting remote retrieval of routing tables, route lookups, etc. Served as chief architect for entire Caimis software suite. Provided customized solutions and support for customer-specific analysis of BGP-4 within their networks (MED cycling, etc.).

CAIDA 1998 - 2001

Researcher, Software Engineer

Developed `cflowd`, a system for collecting and analyzing data from Cisco NetFlow output. Developed `skitter`, a large-scale Internet path measurement tool using ICMP. Developed `arts++`, a library for storing and retrieving large quantities of data from `cflowd` and `skitter`. Helped Cisco develop NetFlow version 8, and helped Juniper test their NetFlow implementation.

ANS (Advanced Network and Services), AOL (America Online) 1992 - 1998

Staff Engineer, Senior Engineer

Developed network management systems software for NSFNET T3 and ANS networks. Developed ICMP and SNMP pollers for the ANS Network Operations Center. Developed simple alert management system. Developed trouble ticketing system applications using early release of Remedy trouble ticketing system. Provided system administration support for monitoring and other support hosts (AIX operating system). Helped Cisco develop NetFlow version 5.

Technologies

Programming	C++, C, Objective-C, assembly, flex/lex, bison/yacc, php, Java, CORBA, XML Schema, XML DOM, UNIX shells, Perl, SQL, Qt, Cocoa, Objective-J, javascript
Protocols	SPI, CAN, RS-232, BGP, ICMP, SNMP, DNS, TCP/IP
Operating Systems	FreeBSD, Solaris, Linux, AIX, OS X

Education

B.S. Electrical Engineering December 1991

- University of Michigan

Other Software Experience

This is a partial list of software I've developed for personal and professional use, outside of the workplace. This list is only intended to indicate additional skills and technologies I've used effectively.

libDwm

Approximately 30,000 lines of C++ library code used in many of my C++ projects. Licensed (without charge) to some of my previous employers for use in commercial products.

sitesearch

The indexing and searching facilities used on my web sites. Indexes HTML pages, php pages, Wordpress blogs and gallery3 photo galleries. Makes them all quickly searchable via the search box on my web sites. Back end is C++ with flex lexers and bison parsers. Front end is mostly javascript.

avrslave

Allows a PC to command various hardware actions on an Atmel AVR microcontroller via an RS232 connection: general purpose I/O, PWM, ADC reads. Includes code for both the AVR and the PC. Useful for hardware end-of-line tests of PCBs with Atmel AVR microcontrollers. The RS232 can use UART hardware or a software UART on any digital I/O pin on the AVR microcontroller. Microcontroller code is C++, PC code is C++ and C#.

Mib++

Complete SNMP MIB compiler for SMIv2 written from scratch using flex, bison and C++. Instead of generating code, my compiler generates a database that can be queried from applications. Database lookups are speedy, with a reasonably small memory footprint.

Dns

A C++ class library for asynchronous DNS lookups. This was motivated by the need to perform millions of reverse (in-addr) lookups from the IP addresses in `skitter` and other network measurement data. Nearly every record type in common use for IPv4 is supported: A, CNAME, PTR, MX, NS, SOA, HINFO, MB, MR, MG, MINFO, and LOC records.

phlegmp3

An mp3 jukebox system. It multicasts mp3 data over RTP, and uses CORBA for control, upload/download, etc. Nearly all of it is written in C++, though there is a java client to control the jukebox. The main client uses Qt for the GUI.

sparkle

Monitored and controlled X-10 devices in my home. Speaks to a few different X-10 devices (MR261, PowerLink, CM17A). A central servant provided a CORBA interface for clients.

miscellaneous embedded work

I've designed and deployed a small number of Atmel AVR based projects in my own vehicles using the Atmel AVR 8-bit microcontrollers. Examples: a simple controller to change the drive-by-wire throttle mapping, a controller to enable and disable different levels of dynamic stability control (and remember my settings across drive cycles), and a controller to flash my third brake lamp based on rate of deceleration (using the speed signal from the rear differential), LED cabin lighting with PWM dimming and separate red and white lighting.

Hobbies

software

Writing software is not just my profession; I enjoy it as a primary hobby. I maintain a web site for my hobbies (www.rfdm.com), mostly for my own use. I have personally authored much of the software behind it. I always have a personal software project in progress, embedded or otherwise; it helps me continue to grow as an engineer and I enjoy it.

automobiles

I've been an automobile lover since childhood. I enjoy working on my cars, attending car shows and an occasional day at the race track in my own car.