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Summary

Engineer since '78 with depth and expertise in a variety of areas, including: systems software, language components, tools development, client/server, telecommunications, database analysis, software configuration, build and release management, packaging, process architecture, scalability, software porting and interprocess communication, Unix and Linux systems interfaces and architecting large systems.

Strong ability with all things *nix. Industrial strength scripting in python, bash, ksh, sh, perl, tcl, etc. Facile with RPM, deb, and pkg.

Proficient with Linux/Unix administration, ClearCase, Perforce, SubVersion, sendmail and all forms of subsystem configuration.

Education

2008 Graduate level course in cryptography, Worcester Polytechnic Institute

2000 Admin Training in ClearCase from Rational University

M.S. C.S. 1988 Boston University

B.S./math 1979, Northeastern University

Experience

EMULEX, BOLTON, MA SEPTEMBER '10 -

Staff Engineer

In charge of release engineering for many areas of the company, and specifically for all components that originate from the Bolton office.

Almost all of their tools were written in bash using a monolithic style. Each tool lived in as many branches as their projects occupied. I restructured their entire build system so that tools used for building, packaging, publishing and staging were all isolated out to a new non-branched repository. This new repository consolidated all of the tools that were the same across the different branches, and the tools that differed were converted to a table driven design. The cost of maintenance was thereby greatly reduced. The new repository was designed specifically with the idea of code reusability and code sharing across multiple processes, and even multiple projects, by requiring that all tools must go through an installation process. This has had a great influence in the whole tools and test development model. The idea that a repository should have a design can have a strong empowering effect.

I implemented the One Button Build and Staging Automation system (OBBSA), written in object oriented python. The idea is to create dynamically loadable builder and stager modules that can be each independently developed. Each such module can leverage as much previously existing infrastructure as existed, while still guaranteeing that the process had reproducible integrity.

I also provide technical direction to a collection of teams in many locations.

COBHAM, LOWELL, MA APRIL - JUNE '10

Implemented tests in python using wx and numpy to perform radio frequency analysis (fft, Bode, Noise Figure, etc...). Test environment interfaced to a signal generator using GPIB using Visa. All development was written under Windows. wx was also used for plotting of the resulting complex data. Numpy / python was used as the replacement of prototype code written in matlab.

LOCKHEED MARTIN, FORT WORTH, TX SEPT '09

A web app for management of classified data was migrated from Solaris 9 to 10 and its entire environment was rebuilt in 64-Bit mode. They had over 4M lines of code with no CM, and no tools of any sort. They now have a clear plan on how to proceed.

LOCKHEED MARTIN, SUNNYVALE, CA APRIL '09

(CLASSIFIED) A Lockheed project had architectural problems with their implementation of ClearCase, ClearQuest, and MultiSite. A new View Server was identified as a core problem. In addition, triggers and scripts were written, Login environments were properly defined. Storage was reclaimed. I designed their

previously non-existent branching strategy. Corporate cultural issues played a large part in the presentation of their problems.

VIASAT, MARLBORO, MA DEC '05 – OCT '08

Software Engineer

(CLASSIFIED) ViaSat is a government contractor. The division I worked in is focused primarily on encryption devices.

- Worked on restructuring the build process for software at the Corporate level developed under Linux. This included source code repository structure management, perforce access issues, definition of reusable library components, COTS repository management, as well as source repository shape definition issues.
- I created a common directory structure that contained globally defined tools. This directory structure was fully integrated into the Linux/Unix login environment.
- PCKL (the PC KeyLoader) is a tool for loading keys into crypto devices. PCKL is written in Python. It communicates with the crypto device over an HDLC RS485 serial port to an encryptor for the MIDS-JTRS program using the EKMS-308 standard under the PSIAM architecture. The communication from PCKL to the serial port is encapsulated through a server process which isolates knowledge of the port. This encapsulation also allowed for easy protocol debugging.
- PCKL was built on top of a message passing framework (VTT, the ViaSat Test Tool). In addition, VTT is used for rapid deployment of other tools for a wide variety of purposes.
- PCKL and associated tools were ported to work with other crypto devices.

GUARDIUM, WALTHAM, MA DEC '04 – NOV '05

Software Engineer working in Release Support and Software Packaging

- Guardium's product was shipped to customers in native package formats for all known Unix/Linux platforms. I implemented package management for their product in RPM, .deb, pkg for Solaris, and pkg for AIX. Also performed build verification.

AXIOWAVE NETWORKS, MARLBORO, MA SEPT '03 – NOV '04

Principal Technical Consultant working in Release Support and Software Packaging

Axiowave was a company that created a terabit metro class core router.

- Implemented the software used for burning flash memory. Flash was used for the boot loader, monitor, and FPGAs.
- Implemented a tool for extracting all debug/log/trace data from the device for later analysis.
- Worked on various Clearcase tools, triggers, utilities, etc...
- Set up the system to be used to perform *gcov* analysis.
- Performed an analysis of all LynxOS system calls to determine if they were re-entrant or restartable as advertised.

TREBIA NETWORKS, ACTON, MA JULY '02 – MARCH '03

Consultant

- Designed and implemented the basic branching strategy under CVS.
- Implemented high quality hooks into CVS to do things like branch locking, subdirectory locking within a branch, tag logging, and various other commit-time checks including commit logging.
- Set up the nightly build process for their project.
- Tasked to solve various structural implementation problems in their code. e.g., varargs vs stdargs, external data initialization at compile-time, signal issues, etc...

- Responsible for all merges.
- Implemented release support mechanism which defined what files were and were not part of the released package.
- Subverted the compiler to trap classes of warning messages and to email them to their appropriate owners as part of an integrated warning processing strategy.
- Fixed proper dependency generation system wide. General Makefile work.
- Acted as the de facto Unix/Linux system guru.

CONCORD COMMUNICATIONS, MARLBORO, MA JANUARY '01 – JANUARY '02

Consultant

- Responsible for conversion of their network monitoring application from using Ingres to Oracle. This included their imake system, as well as the kitting and installation process.
- Converted their installation process to ksh88.
- Provided direction for ClearCase issues.

LHS PRIORITY CALL, WILMINGTON, MA FEBRUARY '00 - FEBRUARY '01

Consultant

- ClearCase Administrator to help migrate a large badly managed source code base from RCS into ClearCase.
- Set up NFS/NIS on a base of over forty heterogeneous machines using Linux as the NIS server.

OPENROUTE SYSTEMS/NETRIX/NXNETWORKS, WESTBORO, MA OCTOBER 98 - FEBRUARY '00

Consultant

OpenRoute is a company that made smaller routers that were developed under SunOS.

- Initial task was to convert their development system to Solaris. This included replacing their system of compilers for embedded development with custom designed GNU components.
- Their entire system of Makefiles was rewritten.
- All code that used varargs was restructured to use ANSI stdargs.
- Acted as general toolsmith and Unix guru.
- Wrote a secure ftp server to allow customers access to patches and upgrades.
- Lots of interaction as a ClearCase administrator.
- Rewrote bad Cshell scripts into perl so they would work in a mixed Unix/NT environment.

CVS, WOONSOCKET, RI JUNE 98 - OCTOBER 98

Consultant

- Initially brought in to teach a course in debugging techniques for C++ programmers.
- Tasked to implement best practices and implemented a code review of their On Line Transaction Processing system and suggested many changes to their software methodology.
- Gave a company-wide lecture series on various topics, including finite state machines, advanced makefile usage, and techniques in solid coding.

SOCRATIC SYSTEM, NEWBURYPORT, MA APRIL 98 - JUNE 98

Consultant

Established a configuration management setup for a system that formerly had none. Created various tools in perl used to manage a system of generated html files.

UNIPRISE SYSTEMS, INC., NORTH CHELMSFORD, MA. MARCH 97 - MARCH 98

Founder

- Lead engineer initially assigned to acquire IMPERA, an application monitoring system which ran in conjunction with HP IT/Ops under OpenView.
- Responsible for a complete redesign of the configuration management component of the project, including directory redesign and makefiles.
- Designed and implemented a test system for the product which allowed for regression and consistency checking utilizing IT/O's own internal API.

MEDIAONE, INC., LOWELL, MA. JUNE 96 - MARCH 97

Consultant

- MEDIAONE had a database that needed to be transmitted from a Tandem over to a Unix/Oracle database. I wrote a server to receive the data from a client process. The server would set up the associated Oracle tables using SqlPlus, and then start a SqlLoader process. The resulting process was speeded up by five orders of magnitude.
- After the data was loaded, additional transactions needed to be transferred to Oracle. These would manifest in the form of SQL statements and would frequently be upward of 500Meg per day. The solution was to write a program which executed these SQL statements using OCI calls. YACC was used to parse statements to see if they were a statement type that was already seen. If it was a new statement type, it would be parsed by Oracle and then executed. If it was an already known statement type, the statement would simply be executed and the Oracle parse would be bypassed. This allowed a speed increase of approximately sixteen times over simple execution of the SQL statements. Software targeted Pyramid Niles, AIX and Solaris platforms.
- Acted as systems person at large. I was specified as the point man for anyone who had programming or Unix questions.

UNIPRISE SYSTEMS, INC., BURLINGTON, MA. MARCH 94 - JUNE 96

Uniprise Systems targeted the downsizing marketplace and started by acquiring ownership of the DIGITAL VMS PL/I compiler. In addition, Uniprise Systems produced a PL/I compiler for the Alpha platform running Unix. This allowed users to migrate to inexpensive workstations from mainframes and VAXen.

- Assembled the Engineering Department.
- Responsible for the compiler symbol table, and the PL/I specific high level debugger. The debugger was noteworthy in that it incorporates architectural designs which guarantee its integrity in a way that no other debugger can claim.
- Responsible for local tools definition and development, and configuration management.

FAX INTERNATIONAL, INC., BURLINGTON, MA. JANUARY 91 - MARCH 94 (LATER UNIFI COMMUNICATIONS)

Founder FI was a store and forward fax business which initially targeted traffic between the US and Japan. A customer's fax machine would be subverted to cause all traffic bound for Japan to come in to the FI network via an 800 number in San Francisco. Upon completion of document reception, the document would be transmitted to a duplicate station in Japan via a dedicated T1. The Japanese station would then make the delivery to the destination using a local phone call. The customer never gets a busy signal when sending and FI takes responsibility for dealing with all other problems involved in delivery.

Architect responsible for:

- Creation of the development environment using, in part, almost all of the GNU utilities (gcc, gmake, rcs, gas, etc.) from the Free Software Foundation. This also included the entire source code configuration management system. High code quality requirements were enhanced via initiation of code review sessions.
- Acting as touch-point-at-large on any issues concerning Unix for the rest of the software staff which grew to over thirty people. This included all tools development not done by myself. Tools were written in a variety of languages including: C, shell, expect, tcl, awk, sed, perl, etc...
- Provided systems administration and performance tuning direction including performance analysis of applications and kernel tuning using sar, prof, timex and crash. Kernel tuning was applied to machines varying in memory configuration from 8 to 64 Meg resulting in significant improvements.
- Design, documentation, implementation, and integration of the Fax Concentrator (FC). The FC is an ISA bus machine fitted with BrookTrout cards running SCO Unix, which is responsible for the reception and delivery of customer faxes. Some interesting characteristics of the FC: It uses in excess of forty processes all coordinated using System V semaphores, message queues, shared memory, and STREAMS pipes. A part of the FC was the NFTA (Network File Transfer Authority): an asynchronous interface to network file access, with full control over the degree of client Ethernet card saturation. Performed a full analysis of converting from analog lines to use ISDN in Japan (NTT switch) with Dialogic/Promptus hardware, with Dialogic voice and fax gear, and with Primary Rate, Inc. hardware.
- Designed and implemented a log collection and data reduction tool to process > 45Meg/day worth of FC log files using scripts written in shell, perl, awk, and many other text manipulation utilities.

PERIMETER, INC., NASHUA, NH. OCTOBER 90 - MARCH 91

Consultant

Given task of creating an interface between a realtime data collection system running Ingres under Xenix, and a statistical reporting system, in a telephony environment. Also designed a complete source code configuration and object module management system, similar to the system designed for Data Acquisition Systems for software with a unit cost of five million dollars.

ARTIS, LTD., LEXINGTON, MA. OCTOBER 90 - JANUARY 91

Consultant

Designed and implemented a system under SCO Unix for transmitting real-time advertisements stored under Oracle, for dealers of collectibles. Ads are sent via modem to a transmitter which relays to a satellite, then down to a network of dealers of collectibles who have been equipped with satellite receivers. Designed and implemented a system for a Unix/FAX interface to transmit ads via FAX for dealers with no satellite receiver using the Brooktrout FAX board, initiated by a call to a 900 number. The same system was then expanded to be used to buy and sell trillions of cubic feet of natural gas.

DATA ACQUISITION SYSTEMS, BOSTON, MA. MARCH 90 - OCTOBER 90.

Consultant

- Given task of porting \approx 20K modules from Xenix to ISC Unix. Nature of the software was to perform process control used by the pharmaceutical and other industries.
- Implemented a two phase translator using yacc and lex to reorganize all include statements in source code to conform to desired standards.
- Designed a source code control structure which allowed engineers to create a local development environment which would not interfere with other engineers. Revision control was done in RCS.

INTERSYSTEMS, CAMBRIDGE, MA. FEBRUARY 90

Consultant

Responsible for rearchitecting the interrupt structure of a MUMPS system which ran under 12 different Unix platforms ranging from 3b2 to dual universe machines. Involved working all signal calls to use sigvec (secure signal facility).

SECURITY DYNAMICS, CAMBRIDGE, MA. AUGUST 89 - JANUARY 90

Consultant

Responsible for design and implementation of existing security software to be converted to a client server architecture running under VAX/VMS in kernel mode. Acted as technical lead for concurrent Unix implementation. Also responsible for delivery of product to marketplace. Implemented a time-sensitive, reproducible test environment using DTM (DEC Test Manager). Administered code under VMS using CMS and MMS.

AGFA COMPUGRAPHICS, FEBRUARY 1989 - AUGUST 89.

Consultant

Implemented custom software to enhance Compugraphic Automated Publishing System (CAPS) under SunOs. Included: A forward and reverse translator to convert between WordPerfect 5.0 and CAPS. A graphics converter to go from Interpress to Sun Unix raster format. A translator to convert from WANG WITA format to CAPS. A fixture rotator which performed surgery on PostScript files to cause header and footer fixtures of landscape mode pages to be rotated into position of portrait mode pages. Implementation of a ten phase translator used to produce a brake parts catalog of thousands of pages in length.

PRIME COMPUTER (FRAMINGHAM AND BEDFORD, MA.), JUNE 1986 - FEBRUARY 1989.

Senior Software Engineer

Responsible for specification, design, and implementation of a multi-tasking, object-oriented, lisp-based, menu-driven operating system which was used as the software platform for a three-dimensional graphics CAD/CAM work-station on an SGI platform. Some tasks included: an icon editor, a foreign calling mechanism to allow lisp code to call C functions, an I18N effort which included an interface to specify alternate fonts to allow kanji, a signal handling mechanism to cause asynchronous unwinding of lisp code. Also instituted proper software configuration methodology including use of make on a body of code of order 10 million lines, and implementation of a Makefile maker.

TRANSLATION SYSTEMS, JUNE 1985 - JUNE 1986

Senior Software Engineer

Responsible for functional specification, design, and implementation of a multi-language, high-level debugger using lex and yacc, running under Unix(4.2) to support a suite of compilers (based on ROBERT FREIBURGHaus technology) all using a common code generator. Target platform was the Computer Consoles Power 6 (Tahoe) machine. Also assisted in other components of the project including the PL/I subset S front end, the machine independent optimizer, and the runtime libraries for C and PL/I.

ANALOG DEVICES, 1984-1985

Software Project Engineer

Responsible for functional specification, design, and implementation of a cross development environment running under VAX/VMS to target 80X86 architecture running DOS and CCP/M. Components of environment included a code control management system, C compiler, assembler, linker, debugger, and common editors. The whole system networked a VMS system with multiple PCs. Also acted as system administrator for a VAX 750 system.

RAYTHEON EQUIPMENT DIVISION, 1982-1984

Software engineer responsible for projects including: B5 Military functional specification for a diagnostic test package to execute on an in-house processor architecture as part of an embedded system. A debugger/monitor to run on a Motorola 68000 based single board computer. A UNIX assembler for the for the Military Family of 32 bit computers (MCF). This involved development of grammar and use of LALR(1) parser generator, plus object file translator to go from MCF Nebula format to UNIX a.out format.

DATA GENERAL CORPORATION, 1979-1982

Software engineer responsible for overall design and development of a hierarchical DBMS runtime interface environment for AOS/VS PL/I. Previously responsible for design and development of PGU (Parameter Generator Utility), a Meta-Information Language Processor. PGU took input from new-to-be-designed language and produced table driven output for PL/I and assembler. Later output was to be in C and Ada. Project called for extensive use of parser generators. previously worked on USERLIB (OS runtime interface), callable from PL/I and intended to be compiler independent. Previously, sole programmer on SWAT, DG's multi-language high-level debugger. Responsible for enhancements, design specifications, bug fixing, and ongoing maintenance. Installed C, PASCAL, COBOL, PL/I, and FORTRAN 77 into the debugger.

PANAMETRICS, 1978-1979

Responsible for design, coding and implementation of interactive data gathering and retrieval systems using Alpha-Micro computer system (simulated DEC PDP-11 RSX-11/M) for a hygrometry product. The

entire system was written in BASIC. Also wrote a system for creating BASIC source code from components to implement include files.

Hardware/Software/Language

UNIX (all flavors including BSD4.x, XENIX, SVRX, and dual universe environments), VAX/VMS, AOS/VS, Primos, Computer Consoles Power 6, various Motorola 680X0 environments, Mips, Silicon Graphics, 3B2, Altos, Arix, Pyramid, Sequent, Sun, IBM/PCs, 16 and 32-bit Data General Eclipse, PDP-11, C, C++, PL/I, awk, perl, Python, Tcl/Tk, PASCAL, BLISS, FORTRAN (all flavors), LISP, BASIC, ALGOL, Emacs, PostScript, bash, COBOL, etc.... and of course \LaTeX and \METAFONT .