
J C LAWRENCE
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LINUX AND UNIX SOFTWARE ARCHITECT AND ENGINEER

I have successfully held positions ranging from manager, architect, or team or project lead to individual contributor. Particular strengths are:

- ▷ Self-motivated, hands-on and solution-oriented professional
- ▷ Effective team builder and contributor who can establish consensus and direction
- ▷ Full system and product lifecycle experience
- ▷ 18 years of experience designing and building real solutions
- ▷ Rapid quality programming skills
- ▷ Able to work under tight deadlines and meet them
- ▷ Excellent written and oral communication skills for customer or in-house presentations.

SKILLS

LEADERSHIP: Project manager (7 months), System architect (1 year), Team/project lead (5 years)

LANGUAGES: C (15 years), C++ (5 years), shell (12 years), SQL (3 years), python (2 years), PHP (2 years), Tcl/TK (1 year), perl (1 year)

OPERATING SYSTEMS: Linux (6 years), Unix (10 years – IRIX 2 years, HP-UX 3 years, Solaris 2 years, AIX 1 year, CLIX 6 years, Ultrix 1 year), pSOS (1 year), OS/2 (4 years)

TECHNOLOGIES USED: OOA/OOD (generic/pattern programming, Loki, ACE, OSE, STL...), stream and block ciphers (OpenSSL, PGP/GPG, blowfish, AES...), kernel (Linux, HP-UX, Solaris), parser/language design (lex, yacc, bison, flex, ANTLR), message passing (MPI, XPI, ACE), SNMP (NetSNMP, cricket, mrtg, UCD-SNMPd), network protocols (TCP/IP, XNS, SNMP, SMTP, HTTP, FTP, telnet, syslog(8), libpcap, packet and protocol analysis, stack analysis...), web

scripting (PHP, Zope, perl, python, CGI-bin), XML (XUL, Xerces), X11 toolkits (QT, GTK, Motif), SCM tools (BitKeeper, CVS, ptools, Clearcase, Perforce, PVCS...), etc.

COMMUNITY INVOLVEMENT: Code and design contributor to the following Open Source projects: Linux Kernel, OpenSSL, Mailman (mailing list server), Squid (caching web proxy), exmh (mail client), nmh (mail handling system), TMDA (Tagged Mail Delivery Agent), Cricket (SNMP monitor), PHPLib (web extension library), Gabber (Jabber P2P IM client), Drupal (Weblog/CMS system), Zope (web application server), Plone (Zope-based CMS/portal), Debian/Linux, and wide variety of smaller tools, especially in the file manipulation and automation arenas.

Additionally I've been building scalable high performance mail systems (multiple million deliveries per day) on a consulting basis for the last 4 years.

RECENT EXPERIENCE

PROTEGO NETWORKS (AUGUST 2002 - FEBRUARY 2003)

Angel-round stealth mode startup for which I'm still under NDA. I held the position of System Architect and was responsible for the technical definition and broad implementation of a Linux based distributed security appliance. I researched and defined the architecture up to early alpha release, while developing the core component of the product.

SKILLS/TECHNOLOGIES: Product and system design and definition; architecture definition, requirements analysis and implementation; system and requirements documentation; C++; OOA/OOD; truth maintenance systems; predicate logic systems; multi-threading; firewalls; routers; CISCO SAFE architecture; TCP/IP; sockets; internet protocols; exploit analysis; Linux; near real-time processing; performance and scalability design; high transaction rate systems; distributed processing; client/server; constraint language design; CVS; Bitkeeper; software appliance

SUN-COBALT, LINUX APPLIANCES (APRIL 2002 - JULY 2002)

Ported Cobalt's in-house extensions and PROXY.PAC supports from Squid 2.3 to Squid 2.4 and re-architected and implemented the web-based user interface and administrative supports for the CacheRaq product to Sun-Cobalt's new

Linux distribution and UI standards definition. Prepared and packaged the new product for general release and provisioning via BlueLinq. Documented all changes and transferred maintenance of product to in-house staff.

SKILLS/TECHNOLOGIES: C, HTTP, web caching, porting, PHP, perl, javascript, sockets, threads, Linux, UI design, product life-cycle, requirements analysis, performance, CVS

2WIRE, GATEWAY DEVELOPER'S GROUP (APRIL 2001 - DEC 2001)

Reported to the Director of Software and later the VP Engineering. For 2Wire's Trimedia based "HomePortal": reverse engineered and implemented Dialpad's Voice over IP (VoIP) call control protocol (VSCP) and delivered a VoIP application based on that. Implemented a pthreads library, the logging sub-systems (debug, event, syslog, etc), and much of the management and diagnostics console for same. Did the initial scoping and analysis for implementing a full PKI/IKE/CA infrastructure for the HomePortal.

SKILLS/TECHNOLOGIES: Embedded platform, C, pSOS, RTOS, VoIP, SIP, Emweb, TCP/IP, sockets, threads, Linux, requirements analysis, reverse engineering, PKI/IKE/CA, IPSec, network and packet trace analysis, Perforce, software appliance

MAXTOR, NETWORK SERVICES ADVANCED TECHNOLOGY GROUP (DEC 2000 - MARCH 2001)

Reported to the Director of the Networks Services ATG. Troubleshoot and resolved longstanding issues with Maxtor's Network Attached Storage (NAS) products. As project lead for the ATG group's tools development team: built the team and defined and performed analysis and testing related to possible ATA protocol enhancements and possible Maxtor storage products and general storage system/file system enhancements (eg block assignment strategies). Implemented ATA Tagged Command Queue support as a kernel module in the 2.4.0 Linux kernel (unreleased patch). Implemented an internal knowledge base and documentation system. Delivered frequent mentoring and brown bag sessions on engineering and development processes, tool chains, security models, and network integration. Acted as the Open Source/Linux contact and representative for Maxtor's interests in regard to file systems and ATA drivers.

SKILLS/TECHNOLOGIES: C/C++, python, perl, Linux, ATA, IDE, NAS, Linux kernel, device driver, STL, performance

analysis and tuning, reverse engineering, storage protocol analysis, team lead, CVS, BitKeeper, software appliance

NURON (AUG 2000 - NOV 2000)

Reported to the CTO. Assisted in the design, implementation and testing of an FPGA-based memory module device driver (primarily used for SSL acceleration), and integration of same into the Linux Kernel and OpenSSL (Linux Kernel Module with ioctl() API). Acted as architectural advisor for other Linux related development and design efforts. Designed and implemented engineering intranet and collaboration systems and trained end users on same.

SKILLS/TECHNOLOGIES: C/C++, OOA/OOD, SSL, cryptography, python, shell, perl, PHP, Linux kernel, device driver, Virtual Memory (VM) system, performance tuning, Apache, BitKeeper

CRITICAL PATH (OCT 1999 - JULY 2000)

Reported to the Professional Services Director and Engineering Director. Designed and developed a mail aggregator for wireless (WAP) device email delivery. Assisted in the final development into alpha release of Critical Path's Webmail NG v4.0 (Apache module). I handled MIME and the Document Object Model (DOM) across its interpretations by mail clients.

SKILLS/TECHNOLOGIES: C/C++, OOA/OOD, Linux, Solaris, FreeBSD, OOA/OOD, STL, SMTP/POP3/IMAP, MIME, TCP/IP, sockets, Apache, QMail, Apache modules, CVS, client/server

VA LINUX SYSTEMS/VA RESEARCH (FEB 1999 - OCT 1999)

Reported to the Vice President of Engineering. Established and staffed the Linux/IA64 project (porting Linux to Itanium/IA64), and became project manager of same. Helped establish the seven company consortium that formed "Project Trillian" (CERN, Cygnus, HP, IBM, Intel, SGI, VA) for porting Linux to IA64. Designed and built the initial secure network for the project (VPN, access controls, intrusion detection, threat and security models and procedures) and defined, championed, and implemented Trillian's collaborative engineering practices. Drove development efforts from two months behind schedule to over three months ahead of schedule in less than 5

months. Coordinated project development with partners and investors via regular project reviews (VA was pre-IPO). Linux/IA64 was the one of the first two OSes to boot on Itanium first silicon.

SKILLS/TECHNOLOGIES: Project management, team lead, network engineering, security and risks analysis, C/C++, python, VPN, PHP, Linux kernel, TCP/IP, sockets, SMTP/POP3/IMAP, BitKeeper, CVS

SGI (FEB 1998 - JAN 1999)

Replaced three engineers and was responsible for the development and maintenance of the Impresario, PrintTools, and Colour Management System products for IRIX versions 6.5.0 through 6.5.4 (APIs, lpd/lp, X11 user interface/tools, printing interface, printer drivers, print spooler, scanning, and colour management) . Authored a white paper on the security, performance, and functionality of the LPRng spooler. Ported and packaged a variety of open source/freeware packages to IRIX for distribution on CD with IRIX (rman, glimpse, TkMan, queso, analog, webalizer, etc).

SKILLS/TECHNOLOGIES: C/C++, IRIX, OOD, STL, TCP/IP, sockets, printing protocols and architectures, client/server, scalability, ptools, application ports.

SUN/SUNSOFT (OCT 1997 - FEB 1998)

Researched, defined, designed, and implemented a regression test harness to automate testing of Sun's EFS firewall product which was capable of verifying correctness of all EFS features down to the packet level; including: packet and stateful filtering, payload examination, application proxies, encryption (SKIP), Virtual Private Networks (VPN), authentication, and Network Address Translation (NAT). Wrote the initial sample/proof-case test suite under the harness (white and black box, positive, and negative testing). Developed rule based language tools to allow automatic analysis and comparison of recorded packets streams in a firewall context. Did initial analysis toward supporting and testing stream/protocol analysis for exploit interception.

SKILLS/TECHNOLOGIES: C/C++, security, firewall, VPN, cryptography, security analysis, python, shell, Solaris, network security, TCP/IP, sockets, internet protocols, packet and protocol analysis, exploit interception, client/server, scalability, white/black box testing, test automation, TeamWare, system and network engineering

HEWLETT-PACKARD (MAY 1997 - SEPT 1997)

Designed and wrote assertion based regression tests to test multi-byte and wide character XOPEN compliance of the HP-UX Curses library. Developed and documented an exhaustive assertion based regression test suite for HP-UX's str*() and mem*() functions to test for memory model optimisation bugs. Designed, wrote and documented a performance test library for HP-UX's standard C library to be used in performance tuning of those API's across multiple OS releases, patches, 64 and 32 bit, and PA RISC versions.

SKILLS/TECHNOLOGIES: C, HP-UX, multi-byte and wide characters, internationalisation (I18N), UTF8, CURSES, shared library design, assertion based test design, 32/64bit, fcs/kcs, Clearcase

CHARLES SCHWAB (FEB 1997 - APR 1997)

Designed and developed a real-time market data server under AIX to control the timing of the release of market data from live market feeds to Schwab customers. Resultant server significantly exceeded performance criteria.

SKILLS/TECHNOLOGIES: C++, AIX, OOD, OpenClass, STL, market data, IPC, high transaction rate server design, client/server

HEWLETT-PACKARD (JAN 1996 - FEB 1997)

Integrated the VxFS 2.0 journalling file-system commands into HP-UX 10.20. Did path and line coverage analysis of HP's VxFS test base and mentored the engineers who took over the VxFS commands. Year 2000 impact surveyed the HP-UX performance and backup commands and mentored the engineers who made the required changes..

Lead a five person team that ported and corrected old kernel tests detailing shared memory, signals, process model, process environment, and POSIX compliance to standard ANSI C tests that exercised both 32 and 64bit paths through the kernel with 80% path and flow coverage.

Designed, operated and tested high-availability (HA) clusters of 32bit and 64bit HP systems and disk arrays (NIKE, AutoRAID, EMC) and tested and debugged LVM (Logical Volume Management), Shared LVM, multiple initiator SCSI handling, and the underlying NIO and GSC+ SCSI drivers for HP-UX 10.30 using those clusters.

SKILLS/TECHNOLOGIES: C, HP-UX, HP-UX kernel, 32/64bit porting, VxFS, journalling/extent based file systems, LVM, SCSI, clustering, automation, fcs/kcs, Clearcase, team lead

IBM/ADVANTIS (MAY 1994 - DEC 1995)

Added full NLS capabilities to Passport/DOS, an asynchronous 3270 emulator. Assumed all maintenance and feature enhancements for same for versions 1294A through 1294D and V1R2.1-A through V1R2.1-I. Designed and developed the DOS Secure+ TCP/IP dialer, a CDMF encrypted SLIP dialer for establishing a secure link to both the internal IBM corporate TCP/IP network and the open Internet.

SKILLS/TECHNOLOGIES: C, DOS, OS/2, 3270, SNA, TQ, TCP/IP, sockets, SLIP, asynchronous devices, NLS, PVCS

AXIOM INTERNATIONAL (AUG 1989 - APRIL 1994)

Ported Programmable-EDG 3.0a (PEDG), an internally scriptable CAD design file editor from DOS to CLIX (Intergraph's SystemVR3.2 Unix system) and OS/2. Took over all further enhancements to PEDG from versions 3.0a through 4.7i under DOS, CLIX and OS/2 including a redesign and rewrite (380% performance improvement). Designed, and developed "MicroCellstar" a CAD clip art library manager for DOS, CLIX and OS/2 and "Scale-DGN" a fast batch mode CAD design file scaler under VAX/VMS. Lead a two man team that designed and developed a CAAD-based geographical tax area prorating and inventory control system under OS/2, CLIX and VAX/VMS for GTE Data Systems. Ported system-ID based software licensing code from DOS to OS/2, CLIX and VAX/VMS, and was responsible for the design and implementation of the next 6 revisions. Designed, developed a TCP/IP based remote administration and configuration maintenance application for DOS and Unix workstations for PBMK as part of the Superconducting Super Collider project. Performance optimised the software and network configurations of ~700 CAD machines using same.

Held the positions of Director of Customer Support and Director of Manufacturing.

SKILLS/TECHNOLOGIES: C, shell, DOS, CLIX, VAX/VMS, TCP/IP, sockets, library/API design, MicroStation/IGDS, network design, RCS/SCCS, cross-platform development, single source application development, system and network administration, team/project lead