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INFORMATION TECHNOLOGY CONSULTANT

Over thirty years experience in the design and development of commercially successful business and scientific software, in primary or senior roles as a designer, project manager, executive, manager, consultant and programmer for many major software development projects.

Skills are strongest on the technical side, but has a keen appreciation for the practical financial and business aspects of software development. Detailed technical experience with sophisticated software and programming techniques has included operating system and networking internals, as well as development of complete commercial data base management systems. Work in recent years has stressed the high level technical aspects of software development: overall system design, techniques and methodologies, technical direction, selection and teaching use of operating systems, networks, languages, and tools.

SELECTED ACHEIVEMENTS

- Successfully guided a popular open source cryptographic software product though a ground-breaking formal FIPS 140-2 validation process, resulting in major cost savings for the U.S. Department of Defense and changing the nature of the validated software market.

- Created a corporate entity to partially commercialize a long established but rudderless open source project, thereby helping to ensure the long term viability of that project.

- Helped numerous DoD, government, and commercial clients realize significant cost savings through careful technical design and specification, competitive price shopping, and by leveraging the considerable talents and skills of the open source software community in commercial contexts.

EXPERIENCE

The OpenSSL Software Foundation, Inc. (co-founder and president)   *2008-present*

Founding partner and president of the for-profit corporate entity created to handle commercial contracting for the OpenSSL open source software project. The OpenSSL project produced and maintains the world's most widely used cryptographic software library and toolkit.

The OSF provides commercial services in several forms including hourly rate consulting

services, annual software support contracts, and custom work-for-hire software development.

Responsibilities include all aspects of marketing, contracting, and finance as well as hands-on involvement with cryptographic software, in particular validation and accreditation activities such as FIPS 140-2 Cryptographic Module Validation Program (CMVP) validations.

Veridical Systems, Inc. (president and CEO)   *2002-present*

Manager and principal technical resource for this information technology and information assurance consulting firm providing services to the U.S. Department of Defense and commercial sector.

VSI has worked with a wide range of information technology issues, typically providing a comprehensive range of services to a select group of long term clients. Areas of specialization include:

- Problem solving for DoD related information assurance issues (IAVAs, STIG compliance, risk assessments, joint and service specific software product deployment approvals.

- Design, implementation, and maintenance of custom system software that addresses specific customer requirements in the DoD NIRPNET environment. Such software includes versions of Apache httpd, OpenSSH, and OpenSSL customized to satisfy technical and policy requirements of the DoD environment, and specialized systems programming to address otherwise uncorrectable security vulnerabilities. Platforms include several flavors of Linux, HP-UX, and Microsoft Windows.

Irving Burton Associates (no title)   *1997-2002*

Overall technical lead for a $18M+/yr military medical logistics software development effort. The DMLSS (Defense Medical Logistics Standard Support) program is a tri-service initiative intended to replace all existing legacy medical logistics software with one integrated system. This position is on-site at the Ft. Detrick Joint Medical Logistics Functional Development Center in direct support of the DMLSS program management.

Responsibilities include:

Review of project technical designs and contractor software implementations.

Cost-benefit analysis of contractor provided technical services.

Review of hardware and software requirements and purchases.

Preparation, specification, and interpretation of functional Requirements Specifications for components of the DMLSS system.

Acting as a liaison and referee between different contractors supplying closely interrelated software components.

Representation of the DMLSS program at Medical Health Services (MHS) policy making and technical issue working groups and committees.

Review and assessment of compliance with federal and military software development standards.

Preparation and review of contractor Statement of Work documents describing the technical scope of deliverables.

In addition to the above general responsibilities also served directly as the project manager for a $1.4M effort to port the Unix server based portion of the DMLSS system to the Windows NT platform, the project manager and technical lead for a successful four month crash effort to convert the DMLSS server to a different Unix (from DG/UX to HP-UX), and as the project lead for a $1.8M project to convert an existing software product for use by the Theatre Medical Infrastructure Program (TMIP).

Specific accomplishments include:

Orchestrated recovery from a last minute contractor default on RF (Radio Frequency) remote communications software by leading the redevelopment of a 1½ year, $.5M, contractor software product in two months, personally coding the critical portions when suitable short term technical resources could not be found.

Achieved significant savings in software license costs (~1M+ for one product alone) by aggressive negotiations with vendors and by more widespread use of open-source software products.

Established a new technical and procedural approach to software configuration management that for the first time fully defined and controlled software deliverables to the point where the government retains the practical option of competing technical work among multiple contractors.

Design and development of the new intregrated version control repository based on CVS with a web enabled front end.

Cost effective provision of much of the technical infrastructure on inexpensive Intel PCs using Gnu-Linux and open-source software. This infrastructure includes name servers, NAT routers and application proxy relays, and network packet monitoring.

Norwest Mortgage   *1996-1997*

Norwest purchased the bulk of RSCA facilities and assets in June of 1996. Job responsibilities at Norwest were substantially the same as with RSCA.

Residential Services Corporation of America (Technical Director)   *1992-1996*

Senior member (as "technical director", no direct staff reports) of the small group responsible for investigation of new software technologies, oversight of major software development projects, and the shaping of software development strategies for the RSCA/Prudential Home Mortgage family of companies (about 3,200 employees total). Participated in a consulting or technical advisory role in the areas of product selection, software architecture and design, performance analysis, and problem determination for many projects within RSCA. In particular, served as a driving force in introducing and demonstrating the potential of distributed (i.e., "client-server") software on the newly arrived Unix and PC LAN systems in this legacy mainframe shop.

Primary architect for a number of network infrastructure components, including Domain Name Services (*DNS*), *DHCP*, internal web (*http/html*) services, *smtp/POP/IMAP* mail , news service (*nntp*), time service (*ntp*), and *ident* logging. Also responsible for establishing *TCP/IP* based communications links with outside vendors and trading partners. These links typically use *smtp*. *ftp*, or custom socket based protocols with strong encryption and X.12 translations.

Technology development projects at RSCA have included:

- Coordinated the use of strong encryption and Internet (*rfc821//822) m*ail for automated near real time exchange of EDI X.12 Mortgage Insurance requests and responses between in-house legacy systems and outside vendors. Implemented entirely in *perl* and *expect* scripts and using canned software packages such as *procmail*, *sendmail 8.8.x* with m4 configurations, *apache* and *squid* http servers, and (commercial) PGP. Projected savings are $10M/yr.

- Wrote custom ftp server and ftp client software (*perl* and *python* versions) for automated data exchange with mainframe applications. The largest such application automated a previously manual function for savings of $200,00 per month. Also developed numerous socket based client and server components for communication from Unix with CICS, MVS, and WinTel hosts.

- Taught scheduled classes in *perl*, *DNS* administration, and various aspects of Unix system administration as well as many informal sessions on programming techniques, shell programming, networking and IP protocols, *smtp* mail administration, etc.

- Ported software, developed administrative and disaster recovery procedures, and taught use of four flavors of Unix: AIX, Solaris, UnixWare, and Linux.

- First extensive use of 4GL languages such as *perl*, *python,* and *Tcl/Tk/expect.,* including development of core *perl* and *python* scripts used by other projects.

- Developed the first corporate Web server and hypertext documents, including many dynamic (CGI) documents for performing administrative and diagnostic functions.

- Developed demonstration application servers (Sybase Open Server) and participated in the design of the first "three tier" client-server application (PC front end, Unix based application servers, Sybase and DB2 data bases).

- Developed NIS, syslog, snmp, and NFS configurations for the Unix administrators along with many related perl and shell scripts.

- Built, installed, and demonstrated the use of more than a hundred public domain Unix utilities such as Web servers, browsers, and html editors, Tcl/Tk, perl, xv, emacs, gcc, metamail, xntpd, cvs, samba, xinetd, and so forth.

- Designed and built the firewall between the corporate WAN and outside networks (screened subnets with application proxies). Also developed several automated monitoring tools to detect problems with the firewall and target hosts on the attached networks.

- Installed and configured the first *LDAP*, *nntp*, *ntp*, *cvs*, *smb/cifs* (samba) servers at

RSCA.

- Designed the multiple zone TCP/IP Domain Name System (DNS) for the corporate wide area network, including the automated integration of several thousand BOOTP IP hosts.

- Evaluation of PC LAN E-mail software, design and specification of an enterprise E-mail architecture (IBM PROFS, Unix smtp, Lotus cc:Mail) and implementation of custom gateway interface software that exchanges mail address directory information among platforms.

- Implemented the first corporate Internet E-mail link and introduced the use of the Usenet and listserv resources, and later produced the sendmail configurations for all in-house Unix hosts; mail cluster clients, mail relays, and the Internet mail hub.

- Demonstrated the Unix and DBMS configurations needed to support a large number (1900) of concurrent Sybase SQL Server connections. Developed demonstration application servers (Sybase Open Server) and participated in the design of the first "three tier" client-server application (PC from end, Unix based application servers, Sybase and DB2 data bases).

- Designed and developed a general purpose utility for loading customer data in multiple formats to Sybase data bases using a simple custom data definition language, instead of coding separate load programs for each tape format.

- Produced the first working examples of TCP/IP on Novell NetWare, including NFS, printing, and POP mail.

An additional role at RSCA has been the troubleshooting of serious problems with the production network or Unix hosts. These problems are ones that the regular support staff have been unable to resolve and so tend to be fairly interesting, often requiring the use of network data analyzers and careful sleuthing across multiple platforms.

The Wyatt Company (no title)   *1990-1992*

Primary technical resource for a major ($8M) project to develop a software product in a new business area (daily on-demand defined contribution record-keeping) using the latest in PC/LAN technology. This ambitious project also represented a pioneering effort to establish a significant state-of-the-art inhouse software development capability in new and unfamiliar areas. This product attempted to showcase:

> Graphical User Interfaces (GUIs)
> DOS/Windows client to Unix server distribution using dual (IPX, TCP/IP)
>   protocols on Novell Netware
> Distributed RDBMS
> CASE tools

Responsible for overall software design: system architecture, data management, platforms, and major subsystem design. Also responsible for researching, evaluating, and selecting new technologies and software products, including initial setup and configuration and teaching use to other project members. This research required detailed study of current technology: hardware,

PC/LANs and networking software, Windows development and programming aids, data management products and techniques. Also developed a strategy for the use of CASE tools and directed extensive performance and timing studies.

Accomplishments included:

Network

Designed and directed development of an IPX based Remote Procedure Call (RPC) mechanism for client-server communication between DIS/Windows client applications and OS/2 server applications.

Administered a Novell Netware 3.11 server and TCP/IP IPX Token Ring LANs.

Evaluated, selected, installed, and developed procedures for the use of a multi-platform RPC generation tool (NetWise RPC Tool for Unix, DOS, Windows).

Selected and configured IPX, TCP/IP dual protocol stacks for Token Ring Netware (Beame & Whiteside and Novell LWPD).

Unix

Selected, installed, and configured Unix systems (SCO ODT) on multiple Token Ring networks with DNS and Internet mail access (UUCP).

Programming

C, C++ and associated utilities (lint, LEX, YACC, awk, etc.) Helped to introduce C/C++ as a new language to a staff of COBOL programmers and to resolve technical and implementation issues such as mixed model programming and cross platform portability.

MS Windows

Developed methods for interprocess communication via Windows applications and DOS virtual machines via DPMI. Developed techniques for isolating network specific functionality and vendor software (including Windows API functions such as class registration and window creation) to DLLs. Also demonstrated techniques for building ANSI C software as DLLs (with <stdio> console I/O captured to text windows) to permit standalone testing of distributed software components.

DOS

Installed and configured many different DOS OSs (Compaq, IBM, Microsoft, Digital Research version 3.30 -6.0) on various PCs with extended memory management, MS Windows, and Netware protocol stacks.

OS/2

Installed and configured OS/2 1.3 EE, SE, and Netware requesters for consistent DOS-OS/2 network access.

CASE

Installed, configured, and taught use of the KnowledgeWare ADW CASE tools. Established initial forms of the data bases ("knowledge encyclopedias") and procedures for data sharing among multiple users and design tasks. Devised conventions and techniques for representing design elements with the tools.

DBMS

Directed extensive performance testing and analysis of RDBMS products and other file management software on various PC, LAN, and operating system platforms. Also performed detailed analysis of competitor's software products to determine relative performance.

The Wyatt Company (consultant)   *1990*

Performed analysis and recoding of a large benefit accounting system to modern structured programming standards using commercial software engineering tools (LTI RECODER). Analyzed software at the machine instruction level to optimize implementations on both mainframe and microcomputer platforms.

Dialcom, Inc. (consultant)   *1987-1989*

Designed and implemented operating system enhancements as part of a joint venture between Dialcom and a vendor (Prime, Inc.). Produced specifications, designs, and software prototypes and represented Dialcom in negotiations with the vendor. Also planned for the migration of application software to the new joint venture systems. (Prime, all models: PRIMOS, PMA, PLP, FORTRAN, Primenet, X.25, RPC).

Produced a detailed analysis of computer security, with recommendations and specifications for corrective measures for existing systems, and design of security for new systems software. Discovered and implemented fixes for several serious but previously unsuspected operating system security flaws.

Designed, developed, and taught use of numerous software development and diagnostic utilities for use by systems and application programmers. These utilities included the SNAPTRAP dynamic linkage debugger, the VC virtual console, the SDW demand paging monitor, the CPHOOK command processor shell, the TRAP command line editor, the ABBREV abbreviation preprocessor, and others.

Provided technical assistance and consultation to application programmers on debugging, performance, and software design. Taught classes in debugging techniques, computer architecture, operating system internals, and performance issues (Prime: PRIMOS, FORTRAN 4, FORTRAN 77, PL/1, PLP, C).

Analyzed available software development tools and produced recommendations for use of such tools at Dialcom (structured program development methodologies, library management and version control, debugging and documentation aids).

Designed and implemented customized operating system enhancements and assisted the systems group with incorporation of networking, file management, security, boot, device driver, and memory management features in new vendor releases. Designed the mechanism to allow multilingual translations of operating system messages and prompts. (Prime: PRIMOS internals).

Actuarial Computer Technology, Inc. (consultant)   *1985-1987*

Directed a team of programmers in the development of the Benefits Disbursement System (BDS), a major new commercial product for sale to bank trust departments and major corporations. Participated in ongoing requirements analysis and specifications in parallel with the "fast track" software design and development effort.

Designed all major components of the BDS, including the underlying DBMS, transaction processing and journaling, tax reporting, report generation, and interactive screen management. This software was designed to be highly modular in anticipation of frequent changes and porting to other platforms. Created numerous software test and development tools and produced the technical and design documentation. Subsequently advised on the porting of this product to DEC VAX/VMS. (Prime: FORTRAN 77, PMA, PLP).

Science Application, Inc. (no title)   *1984-1985*

Designed and developed the AIM-4 information management system, a comprehensive application development environment including a relation data base management system, interpreted procedure language, query and report generation tools, and a large set of software utilities (integrated text editor and source librarian, cross reference reporting, etc.). The AIM-4 relational RDBMS was designed for distributed transaction processing on various different host platforms (initially IBM VM/CMS and Prime). (IBM mainframe: VM/CMS, PL/1, ALC, JCL. Prime: PRIMOS, PL1/G, PLP, PMA).

NUS Corporation (Manager, Computer Information Systems)   *1980-1984*

Designed and developed the Generalized Data Base (GDB) system, which formed the basis of approximately three dozen distinct applications and generated significant revenue for NUS.

Extensively involved with applications of the GDB system to nuclear utility information management problems, among them the Carolina Power Light (CP&L) Surveillance Test Scheduling and Tracking System, the CP&L Commitment Tracking System, the EPRI Equipment Qualification Maintenance Program, the prototype computerized technical specification system (ASTS), and the NUS Licensing and Information Services (LIS) document retrieval system.

Designed a comprehensive accounting program for NUS's LIS, used for automated processing of monthly statements, usage billing, and subscription invoicing.

Designed, developed, and implemented the "NOMIS Info" electronic mail system, the MAILNET E-mail software, and the LIS E-mail system "LISNET".

Participated in marketing and sales of software related work, in particular the costing of software development proposals and hardware acquisitions. Negotiated with vendors to obtain substantial savings in equipment leases, supplies, and computer services ($40,000 in 1983). As part of this effort also developed an improved automated accounting system for more accurate client billings and higher overhead cost recovery.

Designed and implemented an automated scheduling system for the Department of Energy to track regulatory and technical issues for management of nuclear waste depositories. This system

was based on a commercial critical path scheduling system, McDonnell Douglas MCAUTO.

Computer Sciences Corporation (Member of Technical Staff)   *1977-1980*

Responsible for troubleshooting and critical support of operational satellite attitude determination software, with an emphasis on large interactive graphics systems and data link telemetry transfer, at the Goddard Space Flight Center.

Designed and developed the Online Processing System used extensively for real-time satellite support. Designed and developed various systems oriented utilities and software encompassing a wide variety of concepts and techniques such as channel programming of tape, DASD, and communications devices, graphics device display generation, graphic orders and attention handling, multitasking systems and supervisory appendages in protect key zero, reentrant and recursive routines. (IBM mainframes: MVT, all programming in ALC).

EDUCATION

Graduate courses in computer science, Johns Hopkins University, 1982-1983.
B.S., Physics, University of Virginia, 1977