

Paul Bowman Durao

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Maryland / Washington DC / Remote

Senior Software Architect / Engineer / Software Developer

30+ years of experience full life-cycle software development

Exceptionally well-qualified senior software architect engineer with extensive programming skills. Subject matter expert in applying methodologies, processes, and procedures in the execution of full life-cycle approach.

There is no substitute for a proper engineering degree, first-rate hands on experience, and sophisticated problem solving methodology, but it's not for everyone, and that's where I shine and come through for the team.

Flexible Working Classifications

1. 1099 Contract Worker
2. Corp to Corp Contract Worker
3. Statutory Employee
4. At Will Employee
5. Contract – Sub Contract W-2 Employee
6. Regular W-2 Employee
7. Remote and work at home preferred
8. Willing to travel part, or full time.

Technical Qualifications

- Languages: C, C++, **Java, JavaScript, (Angular Js, DOJO, JQuery), Html, CSS, Ruby**, XML, Perl, Python, lisp, Assembly (ARM/Intel), SQL;
- Operating Systems: Linux, Unix, BSD, OSX. iOS, Motif, **Embedded**;
- Database: **PL/SQL**, Oracle;
- Library, Middleware and API's: **Java EE, ROR**;
- Additional skills: Data Modeling; MVC; UML, TDD, O/R mapping;
- Miscellaneous: **508 Compliance** (web accessibility).

Career Highlights

Work Chronology - Independent consulting, and some full time, sometimes there is a mix. I have done consulting on a full/long time basis too, for NASA and IBM for example, as my skill level has improved relative to the market. I have tended to do more independent contracting work as my skill level, comprehension, and abilities are just different, and more specialized, and therefore higher in fidelity, and in quality (Linux, UNIX, OSX, iOS 8 / xcode 6, development centric, all things UNIX related).

Independent Contracting Work - (2009 - present) always available. Very large professional library exceeding one thousand volumes of IT professional books, and several hundred up to date journals and periodicals. Also including over fifty thousand dollars (\$ 50,000.00) of

high tech computer equipment, monitors, bench equipment and software.

Highly skilled, problem solving, trouble shooting, and salvage and rescue, of Linux and UNIX *software development efforts* in trouble, or that just need that extra skilled, or extra experienced helping hand to get back into shape, or on track. I may do two or three of these a year, lasting anywhere from three months to eight months, sometimes more, last year I did two eight months each for a total of sixteen months. When I work full time I often do two or three projects also and side projects just for the same company sometimes in different roles or capacities. I use my excellent training, experience, and know how in software development on GNU Linux and UNIX to help projects in trouble, and for the *long term customers* I help produce *trouble free, and bug free software and systems*, so that I can take on new projects, knowing that past projects will give me little trouble, I still help other people with their projects, when asked to give a hand.

Widget Development - Linux iOS C++ / Objective C

C++ / Objective C, Graphics Widget Development Expert - 2015 - Writing Graphics widgets, in C / C++ / Objective C++, tables, graphs, spreadsheets, outlines, word processing.

Required knowledge of Objective C++ / C++, Xcode, gdb, iOS, X11, UNIX, OSX, Linux, Graphics.

VP DevOPS - JEE Linux UNIX / Linux RedHat VP of UNIX DevOps for DOT - Linux Solaris UNIX Java JEE DevOPS

Java / Ruby Developer, System Admin Expert - 2013 - 2014

- **Salvage and Rescue Operation**, including data, and application migration, and recovery from **Solaris Sun OS** to **Linux RedHat Enterprise Linux**.

Recovered, and fixed up Linux system, in order to perform migration, and deployment of Financial Management System FMS. Performed application, and data migration, recovered, and fixed system up as needed, both OS, and applications, data, and user related fixes. Maintaining Linux servers. Programming web sites using, Xiki, Ruby, emacs, Web Logic, Java, UNIX / Linux scripts, **J2EE, MVC, JPA, SOAP, Hibernate, JSON, REST, MySQL, Apache**, and Oracle database.

Performed security related tasks, FIPS140, at the operating system and application level, custom build from source code to support secure website. Responsible for bringing up the system to working order, and securing the system. Custom build security system from source code, to secure the operating system, the website. **Secured computer log-in system and website, using FIPS140, X.509 (TLS, SSL) support the PIV card log-in, and other security standards according to National Institute of Standards and Technology (NIST) standards and guidelines for government security.** Provided commercial and professional grade custom Linux builds, and Enterprise level support.

- Designed, developed and implemented time sheet management system using **Ruby on Rails (ROR)** full life-cycle.
- Installed/deployed Ruby, Rails, RDBMS, web server etc.
- Maintained, developed for company servers, internally and for clients.

- Enhanced web applications with new features, bug fix, test coverage, and improved performance.
- Used RSpec to create test driven development (TDD) Experience with all of the GEMS and libraries for Ruby on Rails.

VP - R&D Security - HomeLand Security - Low level UNIX (Embedded, BSD, Linux) security expert

Security Research and Development Consultant - 2013 - 2014

Brought in to research and implement process migration, and related functionality.

Work required expertise in ELF file format, core dumps, binutils, Kernel development and debugging, Assembly Language (Intel X86) and (ARM)and C/C++, multi-threading.

Work required in-depth knowledge of Linkers and Loaders, memory security integrity in both disk and ram as well as Kernel, and User Land Systems Programming, securing device at platform level.

Work required knowledge internal knowledge of Docker, Open Stack, containers, checkpointing, OTP, custom deployment, LXC, Process Isolation, iOS, OSX, UNIX, Embedded, **Buildroot**, U-Boot, Microsoft Kernel, Linux components, from Kernel components, to Libraries, both written in C, and Assembly.

Wrote test programs, proof of concept, and demos to demonstrate, process migration, tamper detection, code signing, and tamper recovery, preservation of state, data preservation, and recovery.

Demonstrated faster startup, and recovery times, from core dumps or attacks.

Illustrated how to attack a process, or protect a process against attack.

Many useful applications can be derived from research work.

Displayed reliable state preservation, hibernation and full speed run time performance.

TRANE - Embedded Building Control Systems

Consultant - Linux / UNIX Embedded Expert 2012 -

Brought in to propose and add a new Modbus communication protocol to existing building control software.

Setup Kubuntu cross compiling development platform on vmware based on eclipse.

Work required experience in VMware, Kubuntu, PPC, **ARM, U-Boot**, Eclipse, subversion, communication protocols, embedded Linux, C++, Assembly, gnu gdb, GNU debugger, qmake, build systems, tftp, NFS, Modbus, **M2M, IoT**, cross compiling, remote debugging.

Wrote proposal to add new protocol, and proceeded to add new protocol to existing code.

TRMI - Easy Pass - Toll Booth Embedded system

Consultant - Linux/UNIX Expert Witness and Subject Matter Expert 2012

Brought in to diagnose a system's failure, and to perform a diagnosis and forensic analysis, and report findings and results, and advise as to what to do.

Expert in all things Linux and UNIX, with knowledge to understand systems from end to end, and how they are put together, as well as, diagnose and fix and understand problems, that most other people don't have the experience to understand, or research efficiently.

- Served as an expert witness, and technical subject matter expert, and consultant on systems built on Linux, and UNIX.
- Understand Software development best practices, and processes on Linux and UNIX platforms.

- Able to solve and track down problems, and come up with correct answers in days, that other consultants, take months to figure out, and still don't have the correct answers or fixes.
- Diagnosed and fixed faults as needed, and advised on systems problems, software problems and processes, wrote up reports on causes and fixes.
- Possess a very in-depth understanding of all things UNIX/Linux, and the software development processes and tools involved and available, trained at NASA, and latter became a consultant for them on their own UNIX, and Linux systems helping as many as 500 people with technical problems and processes.
- Work required intimate and in-depth knowledge of Linux, UNIX, embedded real time systems, C/C++, STL, POSIX threads, Java, assembly language, Kernel, CORBA, scripting languages, daemons, startup sequences, rpm, rpm debug, system's libraries, Linux / UNIX installation and configuration, ant, gdb, signals, JVM, operating system internals, systems programming, real time, custom device drivers, embedded systems programming, **U-boot, Buildroot, ARM**, network programming, reading core memory, developing patches, and writing fixes in C/C++, assembly, purify, rational, Perl, and Java, embedded RDBMS, X11, Motif, X windows, X server, know how on how to use Linux and UNIX built in tools and commercial tools to diagnose and read and understand the nature of intermittent problems and faults.

Data Direct Networks

Technical Consultant 2011

Brought in to evaluate, and fix Client/Server program for the management of multiple S2A raid systems. Project required knowledge of Java 6 and 7, ant, eclipse, subversion, NetBeans, C/C++, Linux, Linux Kernel, Client/Server programming, X11 server, X-Windows, threading, Kernel modules, daemons, MIB, SNMP, GUI programming, multithreading Clients. Knowledge of large scale cloud computing systems, i.e., RAID, Kernel, and the management of network, and hardware performance issues, was also required.

Detailed Activities:

- Study of and evaluate client / server program, and interaction with multiple S2A servers.
- Add new features as needed.
- Predict and evaluate level of effort to fix problems on multithreaded Java Client program and on S2A Linux RAID Server C/C++ daemon and Kernel.
- Diagnose and fix problems as needed on both Linux Server (C daemon & kernel), and multithreaded Java Swing GUI Client.

Project 76

Technical Consultant 2011

Brought in to do a technical feasibility study on migration, and conversion of legacy software to the most up to date cloud technology. Project required knowledge of past and present technology development evolution.

Brought in to clarify the state of the art in cloud technology and its evolution.

Did a contrast and comparison of existing technologies at all evolutionary stages.

Wrote up the technical solution in the context existing cloud computing technologies, and their capabilities.

Drew on 30 plus years on experience in cloud stack, distributed computing, Internet technologies, and all the generations preceding them.

Some of the technologies studied in this effort included SaaS, Amazon Elastic Cloud el3 cloud, J2EE, SOAP, REST, spring, VMWare, Xen, KVM, map reduce, ILOG, App Engine, Chrome Browser, Chrome Operating System, Go programming language, PYTHON, Java, HTML 5, browser security and embedded languages, Linux, BDS, OSX,

iOS 6 / Xcode 6, embedded operating systems, cloud computing, vitalization, client server computing, data redundancy, data replication, distributed databases, authentication, authorization, data privacy, VISTA, HER, HIT, Open Stack, containers, maturity and evolution of cloud computing and it's various solutions.

Detailed Activities:

- Study of competing cloud technologies by different vendors.
- Study of the evolution of cloud computing and its evolutionary steps and technologies.
- Used thorough understanding of back-end modern cloud computing technologies and front end embedded technologies and modern browser technologies to propose a technical solution, and make feasibility studies about existing, and past and present technologies.

Direct TV

Embedded Engineer 2011

Added new features and enhancements to Set-top box (STB), and conducted white box testing of enhancements, and regression testing, to guarantee old behavior. Helped find and fix bugs as needed in embedded environment.

Detailed Activities:

- Add new features, and enhancements as needed.
- White-box testing, and regression testing, finding and fixing bugs as needed.
- Release patches with new enhancements as needed.

Work required knowledge of Linux embedded environment, ARM, MIPS, pthreads, assembly, M2M. IoT, C++, JNI, Java, white box testing, parch management, **build root**, Multithreading, networking, GNU source and development methodology, content delivery networks, video on demand, middle-ware, embedded debugging, embedded related issues, OpenGL, memory leaks and core dumps, AI (program recommendation engine), Kernel development, Linux device drivers, M2M, SOAP, AGILE development, SCRUM development, SCRUM Master, Open Source Approach to Software Development, Distribution, and practice described as 'release early, release often.'



Xerox

Software Architect 2009 - 2010

Porting of CAD/AVL software from HP/UX to Red Hat Linux 5. Refactoring and merging of multiple products and branches to single product. Work required knowledge of embedded, QNX, voice, data, and **RF (radio communications)**. Work required use of Oracle 11, Scripting, C/C++, UNIX, Linux, and Clear Case, terminal server, Java, applets, M2M, IoT, GIS, iOS / Xcode, objective C, OSX, cocoa.

Detailed Architect Activities:

- Supporting staff with debugging and tutoring when necessary.
- Supporting staff with integration problems, Linux problems, and tutoring when necessary.
- Supporting staff with system admin problems, when necessary, and tutoring as required.
- Supporting staff with Linux, and UNIX architecture, and tutoring when necessary.

Beryl/compiz-fusion Accessibility enablement of X11 OSS / GPL



GUI Architect 2006 -

Design of accessibility real time panning and zooming feature in beryl and Compiz fusion. OpenGL window manager for X. Note the real time zooming feature is more polished than Apple's and more feature rich. Its more stable than the Microsoft Window's equivalent which may or may not work at all.

Work required a knowledge of the following:

Linux, X11, Open GL, OSS, accessibility, GUIs, video games, ease of use, window decorators, dynamic linking, real time, plugins, input redirection, window management, visual effects, real time dynamic reconfiguration (reconfiguration while still running, no need to shutdown the program to change functionality in real time on the fly while the program is still running), human vision, human retina, human macula, human vision nervous system, HCI (computer human interaction), computer augmentation, human vision augmentation, input devices.

Detailed Architect Activities:

- Design of feature list for accessibility zooming and panning feature including zooming mouse cursor.

Siemens / Nokia

OTN Architect 2005 - 2008

Architecture and design and review of state-of-the-art DWDM **network**, used by high-profile clients to plan their long-haul and ultra-long-haul DWDM networks.

Work required a knowledge of the following:

Linux, SNMP, OSGI Framework, AdventNet Toolkit, Transport Engine, TFTP, Linux Kernel, MIB, Agents, ASN. 1, Java, C, UML, object oriented design, fail over, redundancy, optical networking, firmware, Linux distributions, file systems, UNIX, UNIX startup sequence and boot procedures.

Detailed Architect Activities:

- Design and review of OS implementation and function according to specification and desired functionality.
- Review OTN / DWDM functionality and its Architecture and design and implementation for correctness and for falling within desired specification and functionality parameters.
- Mentored, Supervised and trained apprentices.

UniUniversity

Professor 2004

Lectured and reviewed Thesis.

Work required a knowledge of the following:

Computer Science, state of the art and current computer technology, Algorithm analysis and design, C, Objective C, Java, Data Structures, Operating systems, UNIX, Linux, OSX, NeXTSTEP, linear algebra, calculus statistics and probability.

Detailed academic activities:

- Lecturing multiple computer science subjects and Thesis review and grading.

HMS

Chief Software Architect Jul 2001 - 2003

Recruited specifically to give leading edge technology leadership and technical guidance. Led production of a set of core services that could be used by multiple projects. These services were provided in an iterative yet functional and used as a bases for project development and growth. The group also served as a technical guide and resource to the various projects by providing knowledge or infrastructure design and code.

Work required a knowledge of the following:

Sun Solaris 8, SQL*Plus and Oracle PL/SQL, RDBMS, JDK 1.3, JSP 1.1, Servlets, J2EE, EJB 2.0, JMS, RMI, XSL, XML, JAXP, BEA WebLogic Application Server 6.2, Oracle 8.1.6, ERwin, Rational Rose UML, RUP, Rational Unified Process, Requisite Pro, MS Project,

ClearCase UCM, Rules engines ILOG, Workflow, OO persistence, transaction processing, batch processing, Documentum, security, iterative development cycles, **eXtreme programming**, design patterns (J2EE & GOF), OO design and development for batch and web applications.

Detailed Architect Activities:

- Establishment of current and long range technology objectives, plans, and policies.
- Created technical vision for the company and plans for implementation of new technical projects or product lines.
- Lead development of core technology products using both internal teams and outside development firms.
- Dispensed advice, guidance, direction, and authorization to carry out plans and procedures.
- Worked with product development and customers to discern competitiveness of new technologies.
- Planned and directed all investigations and negotiations pertaining to technical aspects.
- Analyzed new technologies.
- Managed and directed company's technology advisory board.
- Designed and developed new components for infrastructure development in order to take advantage of architecture and minimize duplication of effort and maximize ease of use and functionality.
- Created new core services as required. This involved creating APIs into the services and adding functionality to the services as needed.
- Used as principal technical advisor to projects in development, including some management and scheduling of work for projects as needed.
- Reviewed any third party products that could be used to leverage development. Integrated such products as needed. These included both GPL (free) and commercial including but not limited to log4j, strus, ant, JUnit, Jakarta project and more.
- Performed requirements gathering and analysis using RUP methodology.
- Performed analysis and design using RUP methodology.
- Made possible the deployment of rose (UML) design models from the various teams in ClearCase UCM environment.
- Reviewed database logical, physical schema analysis and design.
- Performed analysis, design, development, and integration work as well as system work as needed to maximize efficiency.
- Conducted design reviews and redesigned or made alterations or additions as required.
- Conducted code reviews to catch any issues not caught during design review, so that problems could be fixed as early as possible in the coding cycle and to assure once again that the design was correct and accurately implemented.
- Designed secure systems with good fail over capability and recovery mechanisms so as not to lose any transactions.
- Responsible for technical issues for the various services including development integration and deployment.
- Mentored, Supervised and trained architects and apprentices.
- Mentored, and supervised development teams.
- Conducted interviews of potential employees, consultants, and consulting teams.

General Electric Information Services (GEIS) GE Global eXchange

Services (GXS)

Senior Architect for Web Design *Oct 2000 - Jun 2001*

Recruited specifically to get Express Marketplace project on track. Performed web global exchange analysis, design, review and implementation.

GE Global eXchange Services (GXS) is expanding services offered by its Express Marketplace, a business to business (B2B) digital marketplace that capitalizes on business opportunities at internet speed on an international level including the US, Europe, and Asia.

Work required a knowledge of the following:

Sun Solaris 7, Linux, PC servers (BSD, Linux, Wintel) , networking TCP/IP, ARP, RARP, SQL*Plus and Oracle PL/SQL, RDBMS, iPlanet Server 4.0, JRun 2.3.3 / JDK 1.2, JSP 1.1, Servlets, J2EE, EJB, JMS (Progress SonicMQ), RMI, CORBA (Visigenic), IDL, RMI/IIOP, JavaScript, XSL, XML, JAXP, Commerce1, XPC 3.2, xCBL, B2B, EDI, BEA WebLogic Application Server 6.0, NetDynamics 5.0.2, Oracle 8.1.6, ERwin, Taxware, Documentum, Rational Rose UML, OO design and development for web applications and EU e-commerce issues.

Detailed Senior Web Architect Activities:

- Designed and prototyped new, innovative ideas for infrastructure development in order to take advantage of architecture and minimize any architectural problems.
- Designed solutions for the most critical projects. Solutions included a combination of built and bought (Commerce1) components in order to speed delivery or meet the goal of income generation by leveraging existing business communities (internal and external) and integrating them in.
- Performed database logical and physical schema analysis and design.
- Performed analysis, design, development, and integration work as well as system work as needed to maximize efficiency.
- Conducted design reviews and redesigned or made alterations or additions as required.
- Conducted code reviews to catch any issues not caught during design review, so that problems could be fixed as early as possible in the coding cycle and to assure once again that the design was correct and accurately implemented.
- Designed secure systems with good fail over capability and recovery mechanisms so as not to lose any financial transactions while maintaining privacy to EU standards.
- Designed systems with exchange to EDI integration.
- Designed deployment plans that included UNIX servers, PC servers (BSD, Linux, Wintel) and secure networking.
- Responsible for technical issues for the various exchange services including development integration and deployment.
- Performed design presentations for management as well as for development teams both on site and overseas in the Philippines.
- Mentored, supervised and trained junior architects and apprentices.
- Mentored, and supervised development teams both on site and overseas.
- Conducted interviews of potential employees, consultants, and consulting teams.

USinternetworking, Inc.



Senior Software Engineering Consultant & Project Technical Advisor *Oct 1999 - Sept 2000*

Website design and implementation project with commerce features such as shopping cart/basket, payment/checkout, clear commerce, credit card validation, and integration with PeopleSoft.

Performed analysis, design, development and integration work as well as systems work throughout project. Commensurately served as supervisor, mentor, and/or instructor to team lead and junior programmers as needed.

As technical advisor, recommended and implemented key design alterations that put project on track, ahead of schedule, and under budget, making it a high margin grossing project enterprise. The project became the company's most successful b2b website implementation to date with the most web features implemented in the least amount of time.

Work required knowledge of the following:


Erwin, UML, JSP Java, C/C++, JavaScript, HTML, EJB, Perl, PL/SQL, cobranding, b2b and b2c, Veritas search engine, UNIX, Sun Solaris, HP-PUX, BSD, Linux, DNS/Sendmail, Unix backup and security, SSL browser security, MQSeries.

Full life cycle software development duties performed:

- Installation and configuration of UNIX OS, Oracle database, Netscape web server and Broadvision application server.
- Initial database analysis and design from customer requirements.
- System administration support for UNIX and CVS CM during development and deployment.
- Setup programming accounts and environment.
- Web server configuration for e-commerce and commerce enabled application.
- Design and development of web application software using Java, C/C++, PL/SQL, Perl, JavaScript and HTML.
- Integration of code from team members as needed including HTML backend, commerce.
- Management, performance of cut-overs from/to, and between development, staging, and production.

Application hosting duties performed:

- Installation and configuration of UNIX OS, Oracle database, Netscape webserver, Broadvision application server and DNS/Sendmail.
- Webserver configuration for e-commerce and commerce enabled application.
- Configuration and integration of application server with custom components, Orbix CORBA daemons, and other third party COTS such as Taxware, Postalsoft, Net Perceptions expert engine as well as other custom components.
- Configuration and set up of Cron jobs.

IBM Department of Commerce Census Bureau 

System Architect /Senior Software Engineer *Mar 1998 - Oct 1999*

DADS project, a web based database warehouse project:

Design, development, testing, and integration over the full life cycle of project software development.

- Design and development of core app web server mechanisms.
- Design and development of web security mechanisms.
- Load testing and measuring web application performance and reliability by developing customized tools.
- Design and implementation of security in the federal protection of privacy of Title 13 data through the use of various technologies including but not limited to encryption and other technologies.
- Server side application design and development.
- OO design and development of server side web apps.
- Design and development of full text document search capabilities and interface **on both publications (documents) and metadata.**
- Data warehousing knowledge, big data, map reduce, queuing algorithms.

- Performance of database logical and physical schema analysis and design.
- UML and Relational Database design experience with application to web based data warehousing for both private and commercial use.
- Experience in of middleware technologies and issues for web applications.
- Expertise of client server internet and intranet technologies.
- SQL Plus and Oracle PL/SQL.
- Use of OO persistence technologies along with Relational databases with application to web server applications.
- OO technologies and their application to web apps.
- Multiple web browser and platform issues.
- Web app performance and reliability issues.
- Experience in both designing and writing debugging and performance measuring web tools.



Hughes **System Architect /Senior Software Engineer** *Mar 1997 - Feb 1998*

Invited to participate in the establishment of a GUI Center.

Reverse engineered As-Built system design.

Used accumulated body of practical, hands on, system engineering and OO software architecture design and development expertise to find more comprehensive standards for presentation and implementation of technical and practical system-wide solutions to a large As-Built environment.

GUI Center Activity:

Provide point of contact and technical support for multiple subsystems as they relate to GUI issues as well as related software build and deployment environment issues. Work with Human Factors Engineering (HFE).

Architect's Office, and I&T (Integration & Test) personnel as well as software developers in order to:

- Perform system engineering including process improvement and troubleshooting.
- Provide a common look and feel to ECS software.
- Establish more comprehensive standards.
- Provide timely feedback and solutions to GUI developers.
- Increase quality and professionalism of GUIs.

Detailed GUI Center Activities:

- Writing Java, CGI/HTML and Motif code examples (C++, and Rogue-Wave).
- Solving day-to-day development and build environment problems (system engineering, etc.) for developers.
- Building inventory and establishing runtime environment of GUIs.
- Establishing Motif, CGI/HTML, Java and ECS standards.
- Inventorying use of hardware and mapping it to software at DAACs (Data Archive & Acquisition Centers) and mini-DAACs
- Assuring GUIs run on baseline, and according to ECS standards.
- Maintaining the HELP mechanism and other GUI Center common code in Configuration Management.
- Factoring out common code or problems to ECS, and providing common solutions and fixes.
- Reviewing development tools that make up build environment, and associated bugs and/or operations.
- Troubleshooting ECS Image, Make, and CM build environment as it affects Motif

development.

- Providing quality assurance (QA) of Motif, Java, and CGI/HTML GUIs ECS wide.
- Providing technical solutions to QA problems.
- Reviewing As-Built architecture to provide better QA, technical solutions.
- Providing technical review/solutions of ECS GUIs as they relate to ECS/Motif, CGI/HTML, and Java standards and uniformity issues.
- Integration and uniformity of CGI/HTML, Java, Motif, OODCE and DCE.

System Architect / Senior Software Engineer Jan 1997 - Mar 1997



ESST / JESST Client subsystem.

Earth Science Search Tool (Evaluation Fast Track) / Java Earth Science Search Tool (Formal track Release-B).

Invited to finish ESST prototype and apply lessons learned to the design, development, and jump start of JESST.

Reversed engineered As-Built ESST system design and extracted lessons learned.

Brief Background of ESST / JESST:

- Subsystem made up of multiple CGI/HTML apps and one main Java app and multiple C++ LIM/DIM (Local & Data Information Managers) and relies on Data Server for on demand processing and ESDT delivery.
- LIM/DIM servers contain descriptive/info (attributes) about the content of data server and are used to enable searching data server for Products.
- Products can then be ordered from Data Server and billed to customer. Delivery may be via electronic means (FTP) or hard media.

Brief Main Objectives and Core Functionality of ESST / JESST:

- Provide search capability for data server Products through the DIM/LIM servers. To obtain and deliver such products, or if need be, process them on demand.
- Searches for Products to be based on core attributes, PSAs (Product Specific Attributes), spatial and temporal attributes.
- GUI to be able to conduct multiple searches in parallel.
- Billing information to be made available and approved by user before Product gets delivered to user.
- Allow user to review the status of multiple searches at once.
- Allow user to review results of search (collections/Granules returned) and to browse images if available.
- Allow user to inspect results and Subsetting (narrowing spatial or temporal criteria).
- Provide security through DCE for User Authentication.

Work required knowledge of JDK (Java Development Toolkit) 1.0.2, JDK 1.1, JDK 1.1.1, Sun's JWS (Java Work Shop), BXPro 4.0 (Builder Xcessory Builder for Java / C++ / C, and ViewKit), Client/Server (Java, Motif, and C++ daemons), Sockets, Multithreading, CORBA/Object Brokers, CGI/HTML, HTML Servers, DCE/OODCE, Rational Rose Reverse Engineering Tool, Discovery Code Analysis Tool

Summary of Objectives and FYI Interest Points on ESST / JESST:

- System intended to make available/accessible to the general public study of Planet Earth Environment to interested parties including and beyond scientists. System intended to make available vast amounts of Planet Earth data and information due to predicted explosive projected growth of Level Zero raw satellite data (LO) and Processed data for distribution and study to general public.
- High profile large scale customer oriented software to be deployed on the web for use by both scientists and the general public (schools, research labs, etc.)

including nonprofit and profit organizations. Billing facilities for profit organizations available and built into system.

- The first subsystem to make heavy use of Java for GUI and platform independence, portability and growth/expandability through application of most recently available Object Oriented and Client/ Server technology.

Software Architect / Software Engineer *Jan 1996 - Dec 1996*



Release - A Planning Subsystem

Duties Included:

Responsible for OO design & builds from concept through requirements, design, and development to delivery. Performed database logical and physical schema analysis and design. Resolution and facilitation of cross team system design issues. Strong software engineering and leadership/facilitator skills demonstrated. OO design (StP OMT) C++, C, Java 1.0.2 (Java Workshop & Builder Xcessory), Sybase RDBMS, SQL, X-Windows (Motif using builder Xcessory tool), CGI/HTML, UNIX SVR4, Multi Processing Threads. RPC, Sockets, DCE/ODCE object request brokers, ClearCase, CM, Rogue Wave 6.0, Rogue Wave 7.0, SunOS, SGI Silicon Graphics, HP environments, DBTools, CT-Library, DB-Library.

Work required knowledge of Data Warehousing and Data Processing storage system for NASA.

Summary of FYI interest points of note and curiosity:

- One of first subsystems to be available for/and demonstrated to customer in order to show off core functionality and the heart of the PDPS (Planning/Processing) subsystem. One of the first subsystems to have integration and testing NCR (Defect Reports / bugs) worked out. One of the first subsystems to be deployed in test bed and delivered to DACCs.



Software Engineer *Jan 1995 - Dec 1995*

Ir-1 (Intermediate Release-1) - Proof of concept and establishment of good will NASA project. (Original contract: 3 Month Trial Period.)

Developed main Ir-1 components including PGE registration tool, PGE processing GUI, and PGE Execution module for Ir-1 PDPS. Work required intimate knowledge Ir-1 PDPS interfaces, functionality, and objectives as well as desired future objectives, functionality and requirements.

Wrote/Debugged/Integrated/Documented and Tested major modules/components and interfaces of the Ir-1 PDPS prototype planning and processing program. Major interfaces included COTS Autosys scheduling program, Sybase, SSI&T software, PGE, SCF, SCF Toolkit, GUI interface to the SSI&T environment.

Duties included:

code inspection, code development, code maintenance, bug fixing, functionality enhancements and additions as required or desired, unit testing & documenting, porting to SGI power challenge, integration and testing (I&T) of Ir-1 components, documenting Ir-1 PDPS operation standards and functionality for future maintenance by M&O. Also responsible for raising and resolution of any DRs as the need arises as Ir-1 production system prototype is put into full operation.

Work required knowledge of COTS Autosys scheduling program, Sybase, SSI&T software, GUI interface to the SSI&T environment. Also required knowledge of C++, 32/64 bit architectures, SQL, Sybase, X Toolkit Intrinsics, OSF/Motif, code generators, event driven programming, object oriented programming, rapid prototyping, Client/Server, SGI power challenge, Sun OS, software migration, science software, integration & testing.

Summary of FYI interest points of note and curiosity:

System delivered **on schedule** and **under budget**. System delivered with very low count of NCR's (defect reports) in large part due to **good OO team design, team spirit and cooperation**. All defect reports caught and fixed by software engineers

and with the help from scientist before software was delivered due to extensive hands on and real world runs by DACC scientists/end users. **Zero-defect reports** open on delivery and **very little maintenance required** after delivery.

Department of Agriculture

Information System Specialist *Jan 1994 - Dec 1994*

Reprogrammed Proprietary Client/Server SQL database. Achieved and reindexed database for greater reliability and speed. Reprogrammed reports for greater amount of relevant information for overall increase in the productivity of the operation. Created new kinds of reports for daily use and reference in case of system failure. Created new reports for better statistics and information tracking. All of these efforts resulted in more complete, up to date and informative records available at all times on demand, than could previously be produced, increasing overall productivity and reliability of the operation.

Wrote multiple programs for and provided technical support to end users.

Programmed multiple high level applications for end users. Also wrote multiple low level data translation programs for end users.

Work required knowledge of SQL, Client/Server, LAN/WAN, high and low level programming in multiple languages and applications. Also required was knowledge of Novell, TCP/IP, Windows, Groupwise (WP office), WP5 WP6a, Lotus4.01, Paradox 4.5, Checkit pro, and C/C++.

Department of Transportation

Software Engineer *Jan 1993 - Dec 1993*

Designed, wrote, developed and tested federal truck inspection Pen program for the electronic collection of driver/vehicle inspection data by truck inspectors. Addressed problems in pen UI (user interface), RDBM (relational database management), and data translation as well as communications.

Due to prior poor program development practices, work required extensive program analysis using custom built diagnostics tools. These tools are in essence diagnostic C/C++ compilers written in C, Lex and YACC.

Work required knowledge of event driven programming, MS Windows programming, VB programming, structured programming, OOP programming, modular programming, pen UI programming, GUI programming, pen programming, relational database programming, telecommunications programming, communication protocol programming, language translation, semantic analysis, syntactic analysis, C/C++, UNIX, Lex, and YACC.



Bethesda Softworks

Software Engineer *Jan 1992 - Dec 1992*

Wrote and developed custom installation program (more elaborate version of PKUNZIP-like program) in both 'C' and assembly. Wrote and debugged proprietary assembly language video game development virtual reality (VR) library. Work required knowledge of program optimization, factoring and decomposition techniques, as well as graphics user interface (GUI) design and implementation. Other skills employed included strong background in specialized fast rendering graphics routines as well as strong use of graphics and very specialized (and rare) speed optimization techniques.

Atomic Engineering Systems

Systems Programmer *Apr 1991 - Dec 1991*

Converted experimental and scientific data from large IBM mainframe data banks to run and operate on DOS/PC based computer systems. Wrote code for validation and translation; modified and developed proprietary databases; modified, ported, interfaced libraries and applications into protected mode.

Troubleshoot PC-workstation for bus mastering problems and tape backup problems. Set up LAN for the transfer of large amounts of data between PC-workstation and local PC for ease of software production and packaging. Maintained and changed documentation as well as packaging as needed for distribution through the use of AmiPro and other DTP packages. Created distribution disks from software and data ready for shipping and installation. Downloaded and uploaded data from various mainframes on a daily basis in response to customer needs and software updates and distribution. Set up bulletin board system for customer support. Assisted other staff members in numerical analysis, debugging software, instruction and assistance in C++ language.

Programming efforts required strong background in C/C++, Intel Assembly, DOS internals, BIOS, protected mode and libraries.

Hammerly Computing

Systems Programmer *Jan 1991 - Mar 1991*

Worked in a team environment to develop a tool kit for software development in BASIC called ProBas. Wrote and debugged an Assembly language development library for Microsoft BASIC routines included telecommunications, graphical data compression, memory management, etc. Designed conversion process from Assembly to C++ for BASIC library. Involved in porting of the BASIC library to windows.

Work required strong knowledge of C/C++, BASIC and DOS internals (C/C++'s and BASIC's runtime), BIOS, graphics, numerical analysis, telecommunications, memory management, string management, libraries, Windows (memory management, graphics), Assembly and PC hardware.

MicroTutor Software Training, Inc.

OTN Architect *Jan 1989 - Dec 1990*

Assembled all PC's from the ground up for both custom in house and classroom use. In house hardware configurations included a variety of specialized software and hardware, including full page super high resolution monitors, EGA / VGA / SVGA monitors, screen resolution enhancement products, Glyphix, postscript, scanners, Ethernet Lantastic and novel networks, removable media (iomega bournoulis, tape backup systems, optical drives). Also troubleshoot and upgraded PCs as needed. Installed and troubleshoot a large variety of Gem, Windows, and DOS software for both in house and classroom use. Performed consulting projects including customized turn-key applications for end-users. Programming work performed in C++ & Assembly.

Education

B.S Computer Science degree. University of Maryland, May 1991.

References

Available upon request.