

# Lance E. Belisle

## SENIOR SOFTWARE ENGINEER

User Controls ■ Network ■ Infrastructure ■ Design

### ■ Profile

Self-motivated professional with 20+ years experience in providing successful, cost-effective software solutions. Diverse experience derived from rapid learning and effective application of leading-edge tools. A creative problem-solver able to solve complex technical problems, recognized for exceptional work while achieving time-critical deadlines. Solid team player demonstrating diligence, superior work ethic, strong communications skills, and a positive attitude.



- Object Oriented Development
- Distributed/Client Server Systems
- Custom User Controls
- Multi-Threaded Programming
- Platform/Network Development
- Assessment & Application of new tools

### ■ Technical Skills

**Languages:** C#, Java SE, Visual Studio C++, gcc, C++ CLI, bash, awk

**Methodologies:** OO, UML, Design Patterns, Generic Programming

**Databases:** Oracle PL/SQL, MS SQL

**Networking:** TCP/IP, UDP, ASN.1, Java RMI, MS Message Queues, Data Distributed Services, DIS, SNMP

**Tools:** Visual Studio, Netbeans IDE, Eclipse, Clearcase, Microsoft Office, MKS, Subversion, VMWare

**APIs:** JSE(NIO, Swing, Concurrency, RMI, JDBC) .Net (Windows Forms, ADO.NET), C++ (MFC, STL, C++ TR1, The ADAPTIVE Communication Environment) C (BSD Sockets, Posix 1.x, Win32)

**OS:** Windows, Linux, Unix

**Fields:** Military/Aerospace, Public Safety, High Availability, Gas & Oil, Simulators

### ■ Professional History

- **CRITICAL CONTROL, Calgary, AB** Feb 2011 – Oct 2011  
Oil and Gas Section Production Data Management, Gas Chart Integration
- **CAE PS/Xwave/Prior, Kanata, ON** Mar 1994 – Jan 2011  
Aerospace

### ■ Education

- *B. Engineering (Mechanical)*, University of Saskatchewan, Canada (1983)
- *4<sup>th</sup> year Electrical Engineer, Technical University of Nova Scotia (5 year program) as part of Navy training(1986)*
- *Combat Systems Engineer, Canadian Naval Office, October 1983 to November 1987*

### ■ Additional Information

References available upon request.

## ■ Detailed Professional History

### 1. CRITICAL CONTROL - Jan'11 - Oct '11

Project Title: ScanGas Enhancements

Role: Senior Software Developer

Challenge: To enhance the ScanGas application suite to support the newly acquired corporate accounts as a result of companies acquired in the US.

Action: Merging the database records from a number of acquired companies into ScanGas. Added support for scalloped gas charts. Implement a number of custom dialogs in support of the new client's meter types.

Technical Environment: ScanGas, a software product in support of Gas Chart collection and analysis

Skills Used: Visual Studio 2010 C#/Windows Forms, MATLAB, Microsoft SQL Server 2008, Subversion

Result: The records from four different databases have been merged into ScanGas. This had/has to be done in phases such that the service was/and is not disrupted. The ScanGas application has new dialogs to accommodate the varied and different data entry requirements of the newly acquired companies. Implemented the algorithm in C# to correctly process gas charts that are "scalloped" based.

### 2. CAE/PS - Sep'10 - Jan'11

Project Title: Aurora PCT – Rear Crew Simulator/Trainer

Role: Senior Software Developer

Challenge: Brought in to help expedite the delivery of a project that is overdue.

Action: A large number of trouble reports involving the UI need to be addressed. There are in excess of one hundred dialogs implemented using MFC and Prof UIS (an MFC extension/enhancement). Templates were introduced to subclass/customize the UI controls to rapidly achieve the required behavior consistently throughout the application.

Technical Environment: Military Aerospace Simulation

Skills Used: Visual Studio 2005 C++, MKS, Prof UIS, Visual Assist

Result: By reducing/eliminating the repetitious code that was inconsistently implemented in subclasses of the customized controls through the application through the use of templates, both a consistency and reliability were achieved. The team lead had preference that I remain on the team through this and the next delivery. Trouble reports were addressed thoroughly, meeting the customer's satisfaction, without further rework.

#### 2.1 CAE/PS - Jan'10 - Aug'10

Project Title: Boeing Multi-Mode Radar Simulator

Role: Senior Software Developer

Challenge: To modify the existing TMT simulator to use the MMRS. This was a technology demonstrator in advance of the contract to demonstrate system integration capabilities between CAE and Boeing.

Action: Developed the integration of the MMRS into our TMT product. Two very different products were made to work together. A note worthy feature was to develop an integration tester that

supports development of the Boeing MMRS integration component and the TMT independently. This separation of components is essential for the two organizations to work together effectively.

Technical Environment: Military Aerospace Simulation

Skills Used: Visual Studio 2005/2008 C++/C++ CLI/.Net

Result: The MMRS was successfully integrated in the TMT.

## **2.2 CAE/PS - May '09 - Dec '09**

Project Title: Tactical Mission Trainer United Kingdom – Rear Crew Aircraft Simulator

Role: Senior Software Developer

Challenge: Designed and implemented the Maintenance Station Console for the TMT system.

Action: The maintenance station is used to monitor, and perform software updates and verify system availability for the entire installation. SNMP and DIS were used to collect and control the various system computers, audio subsystems, switches, etc. This was a mixed mode development using .Net and unmanaged C++. The user interface was implemented using Windows Forms. The Maintenance Station interfaces with a large legacy code base written in C++.

Technical Environment: Military Aerospace Simulation

Skills Used: Visual Studio 2008 C++/C++ CLI, MKS, Enterprise Architect, Doors

Result: Introduced the use of C++ CLI/.Net into the premiere product of CAE PS, the rear crew mission trainer.

## **2.3 CAE/PS - Sep '08 - April '09**

Project Title: Mission Data Mission System for the Canadian Naval Maritime Helicopter Replacement Program

Role: Senior Software Developer

Challenge: Primarily focused on the implementation of the startup, system state and shutdown of the distributed application for the MHP mission avionics.

Action: Performed the implementation for the startup, state and shutdown of the multi-board mission computer. Developed a considerable amount of code using GDC's proprietary distributed component framework. The environment required a substantial amount of interaction with numerous teams to come up with an implementation that meet their needs. Extensive knowledge of C++ templates was essential in using the framework and extending it.

Technical Environment: Military/Aerospace Avionics Mission System Software

Skills Used: GCC C++ 2.95, Clearcase, SlickEdit, Linux, VxWorks 5.x, Doors

Result: Able to quickly grasp the proprietary distributed component framework; to utilize and extend it to reduce development effort.

## **2.4 CAE/PS - July '08 - Sept '08**

Project Title: Tactical Mission Trainer for the United Kingdom Ministry of Defense

Role: Senior Software Engineer

Challenge: To develop the data element used in a rear crew simulator.

Action: Develop the PDU elements using Distributed Interactive Simulation (DIS). This involves the Inter-process communications between the various simulation subsystems. The DIS framework/library was extended to reduce development effort and support automated testing. Templates were introduced to provide containers at the API level. This greatly reduced the amount of code required.

Technical Environment: The software is being developed using Visual Studio 2005 C++

Skills Used: Visual Studio 2005 C++, MKS, Distributed Interactive Simulation, Doors

Result: DIS is being introduced into the Xwave Simulation code base to replace a proprietary implementation. This is a key implementation feature as it is a de-facto standard adopted by the military, and is well supported by numerous commercial products that are used in CAE simulators.

## 2.5 CAE/PS - Jan '08 - June '08

Project Title: Prototyping the interoperability of software components for the Halifax Class Modernization

Role: Team Lead

Challenge: To demonstrate Xwave's ability as a subcontractor to Lockheed Martin by developing a prototype integration of Elisra's ESM, and Saab's CCS.

Action: Worked closely as a designer and developer with three different organizations to rapidly integrate their software systems. Lead the team of two to implement the subsystem and integrate it on-site. Elisra's ESM was made to interoperate with Saab's and CCS. Prepare the project development environment for the next phase when the team size will increase from two to ten.

Technical Environment: The software is being developed in Java 1.6. The UI development was in Swing. RTI Data Distribution Service for Real-Time Systems is used extensively. The target platform is R.H.E. 5.1 Linux. Elisra's ESM used a simple message based proprietary RPC based on BSD Sockets. Saab's CCS used RTI DDS. A software module would connect to both systems and convert the data structures to/from DDS to Elisra's protocol.

Skills Used: Java 1.6 SE, RTI DDS, MKS, Netbeans, JUnit, Red Hat Linux, BSD Sockets

Result: Introducing Java into the Command Control System of the Canadian Patrol Frigate Class. Lockheed Martin was sufficiently impressed to switch a considerable amount of their development to Java. This technology demonstration was an important part of Xwave's successful bid to demonstrate to the Canadian Navy the ability to integrate existing solutions from Elisra, Saab, and Lockheed Martin.

## 2.6 CAE/PS - Sept '05 - Dec '07

Project Title: XwaveCAD

Challenge: Enhanced the Xwave's Fire, Police and Ambulance Computer Aided Dispatch System

Role: Software Developer & Onsite Software Lead during customer acceptance/delivery.

Action: Improved productivity through the introduction of C# and managed C++. Enhanced the application to use (1) color highlighted entry errors on (similar to JSF) MFC, (2) incorporated US standards and weights entry/display into a previously Metric system, (3) enhanced the architect to support multi-role fire/police/EMS. The key to implementing these features within schedule was designing drop in replacement controls that would fit within the existing design. Developed the system integration with the NCIC (a U.S. police records database).

Technical Environment: The workstation/client application is written in Visual C++ 2005/MFC and incorporates an embedded Web browser/JSF. The server components are written in C, Pro-C, PL/SQL (Oracle 10g). The newer server components are written in C++ CLI (.Net 2/ ODB.Net) with the supporting UI written in C#.

Skills Used: Oracle 10g, C++ CLI .Net 2, Visual Studio 2005/C++, Clearcase

Result: The enhanced Xwave Cad was delivered to FREMS and will be deployed nationally across Canada as an upgrade to existing deployed systems.

## 2.7 CAE/PS - Feb '05 - Aug '05

Project Title: Advanced Spectroscopic Portals/Homeland Security/Ratheon

Challenge: To develop the underlying infrastructure supporting a complex real-time distributed system that would enhance the productivity of the US border guards to detect illegal radioactive products accurately.

Role: Team Lead of Software Embedded Development

Action: Led the development of the real time and networking infrastructure between the sensors, panels and portal facilities. The system consisted of numerous embedded computer, two servers and supporting workstations. A specialized library was written to support data collection from sensors at high bandwidth and deliver the process data throughout the entire system.

Technical Environment: The code was written in C++ Microsoft Visual Studio .Net 2003 and Windows CE 4.0 and later ported to newer versions.

Skills Used: C++ v7.0/CE 4.0, Windows Xpe, Windows CE 4.0

Result: This ASP is in service with U.S. Customs through Homeland Security to secure portal crossings.

## 2.8 CAE/PS - May '02 - Jan '05

Project Title: Software development to meet the needs of the Solicitor-General of Canada

Challenge: To develop secure systems as mandated by the Solicitor General and the RCMP.

Role: Designer / Developer

Action: Solely responsible for specifications, design, development, testing and delivery. I was the entire team. Developed the client/server application that collects and forwards Etherpeek packets to a central system using ASN.1 over TLS. Developed a number of Analysis modules for Wildpacket's Etherpeek in C++ using Visual Studio .Net. Developed an intermediate network WDM driver using Numega's DriverWorks and the Windows DDK. The system had to support a number of other systems which require consultation and team work to make it all work together.

Technical Environment: Java RMI was used extensively as was ASN.1. The application was written in Java 1.5 using Netbeans 4.0.

Skills Used: Java JSE 1.5, RMI, JCE, Swing, TLS/SSL, C++ v7.0, GCC 3.32, Linux 2.6, FreeBSD 4.10

Result: I delivered three applications to the customer's requirements and these systems were immediately put into service.

## 2.9 CAE/PS - Nov 2000 - Apr 2002

Project Title: NAV CANADA: Radar Data Processing System Rehost

Challenge: To develop the infrastructure to support the RDPS Rehost.

Role: Software Developer

Action: Developed the emulation of the MTOS 68000 system calls (C based API) which allowed the re-host of the RDPS. The system calls emulated were thread management, communications, time management, mutexes, semaphores, and message service. The MTOS system calls were "mapped" into HP-UX implementation of POSIX.4 as well as BSD sockets in support of a multi-threaded distributed system. The second task consisted of developing the infrastructure to support a distributed simulation system. A number of simulators written in Java needed to be started, stopped, and controlled remotely. A plugin module approach combined with Java RMI was implemented.

Technical Environment: This MTOS emulation was written in C++ interfaced through C.

Skills Used: HP ACC C++, HP-UX 10.0, Java 1.2, Linux 2.4, Rational Rose

Result: The emulation was very accurate allowing for the reuse of the existing code base with minimal change not withstanding new requirements. The RDPS Rehost is in service with Nav Canada.

## **2.10 CAE/PS - Jan '99 - Oct '2000**

Project Title: NAV CANADA: Flight Information Management System (FIMS)

Challenge: To rescue this project from costly delays and unmet objectives.

Role: Team Leader / Lead Architect

Action: Re-architected the entire application and established/firmed up requirements. The team was refocused; leading to the successful delivery of Flight Information System used by Nav Canada throughout the entire Canadian airspace (non-air traffic control areas).

Technical Environment: This distributed system was written in C++ running on HP-UX. Objectivity, an Object-Oriented Database, was used extensively. HP MCSservice Guard (clustering software) was used to implement server redundancy and fail over.

Skills Used: HP ACC C++, HP-UX 10.0, Objectivity, ACE  
(<http://www.cs.wustl.edu/~schmidt/TAO.html>)

Result: The entire system architecture was simplified. A key feature was the use of the ACE Reactor pattern. This was a huge simplification allowing the application to be developed by a team with limited understanding of Posix.4, and X11 events posting.

## **2.11 CAE/PS - Sept '98 - Dec '98**

Project Title: GD Canada – IRIS Tactical Command Control and Communication System TMHS

Challenge: To assist in the development of delivering the IRIS project.

Role: Software Developer

Action: A proprietary RPC middleware written in Ada needed to be extended/added to. The original developers were no available.

Technical Environment: This distribution subsystem was written in Ada running on Solaris. It was a large complex infrastructure that used TCP sockets as the underlying transport.

Skills Used: SCO Unix, Solaris, Ada

Result: The required functionality was added which allowed the project to proceed.

## **2.12 CAE/PS - Feb '98 - Aug '98**

Project Title: Mosaid Memory Tester

Challenge: Extend and upgrade the infrastructure used in Mosaid's memory tester

Role: Software Developer

Action: A large code base written in C/C++ had to be modified to test the new NVRAM memory chips.

Technical Environment: Mosaid manufactured engineering memory testers. The software was written using MS Visual C++ 5.0. The software was revised to accommodate new types of NVRAM memory. The C++ code generated assembler like instructions for the programming and calibration of a number of boards that reside in a separate tester chassis. One of my main tasks was to simplify the configuration parameters used in the generation of a test run. Previously the code was written in C, and made extensive use of void pointers. This component was revised to a hierarchal class structure.

Skills Used: MS Visual C++ 5.0, proprietary memory testing boards circuit diagrams.

Result: The project was cancelled, but eventually the software would be used in a new family of testers.

## **2.13 CAE/PS - Jan '98 - Feb '98**

Project Title: RATT/SS Enhancement III Project

Challenge: An engineering enhancement involving the detection of incoming HF transmission was required.

Role: Design Lead

Action: To provide the design for the detection of an incoming HF transmission.

Technical Environment: This was a small enhancement to a system I previously lead and designed. There were a number of false detections of incoming HF transmissions. A special algorithm was required to eliminate this problem. A multiport IO board was added that monitored incoming transmissions. This new hardware required new software and had to be integrated into the existing implementation.

Skills Used: OS/2 Ada 83

Result: This enhancement was delivered on time and under budget to the customer's satisfaction.

## **2.14 CAE/PS - Sept '96 - Dec '97**

Project Title: Communications Management System (CMS)

Challenge: The CMS Segment developed by Xwave had to integrate with the TMHS and HCOTS segments provided by the prime contractor, GD Canada. The test team was responsible for quality and testing assurance.

Role: Software developer on the test and integration team

Action: I was the lead in installing and configuring the CMS Segment at GD Canada Calgary for its first demonstration. This was quite the challenge as SCO, Oracle, and numerous other COTS products had to be installed and configured. All CMS had to be black box tested. I had written a test simulator of the BFSM segment in the Ada programming language.

Technical Environment: Xwave was developing the CMS to plan the communication deployment of an army unit(s). This was a complex piece of software that ran on SCO Unix. A number of COTS products and in house developed software had to be installed and configured. The entire CMS was to be blackbox tested by Xwave before being integrated into the entire system.

Skills Used: SCO Unix, Oracle, Solaris, Ada 83

Result: Having a considerable amount of experience with SCO Unix resulted in a rapid installation of the CMS onto a computer. I was then able to clone the installation using simple primitive command line tools, and then adjust the various SCO configuration files to make the installations unique. At the time this was quite complex undertaking as it required extensive knowledge of SCO Unix, which had very stringent built-in license checks. The setup of the delivery was completed in less than ½ the time expected. A previous attempt at implementing a BFSM simulator was falling behind schedule, and proving excessively complex to develop. I revised the design to use the Ada programming language to write the simulation scenarios. This avoided using a separate scenario language which would interface with Ada. This greatly simplified the development. Ada proved to be an excellent language for expressing the scenarios in, as it is strongly typed. The key was to develop a package structure (class infrastructure in newer languages) that was extensible. The BFSM simulator was back on track schedule wise, and was easier to maintain and develop. The trade off was that scenarios had to be compiled, which proved to be a non-issue.

## 2.15 CAE/PS - Sept '94 - Aug '96

Project Title: DND: RATT/SS

Challenge: To get the project on track for a realizable schedule.

Role: System Architect/Software Team Leader

Action: The project was failing in 1994, and I was brought in to jump start it and get it on track through software design, development, and software team management (ten developers). Generated the preliminary design, and coordinated the detailed design as the system architect, and was responsible for work estimation, and assignment. Developed a simple parallel device driver for OS/2. A new schedule and budget were put in place.

Technical Environment: The Canadian Navy uses the RATT/SS system to receive messages from ships at their shore units; the messages are then forwarded to the message handling systems. This system involved telephone modems, High Frequency (HF) Radios, and Satellite receive messages.

Skills Used: OS/2, Ada 83, C++

Result: Had to take over the parallel device driver, as this development was failing. I completely rewrote the driver reducing the code size by a factor of ten delivering a reliable driver that wouldn't crash the system. This project was delivered to the customer's satisfaction on time and on budget (based on revised schedule and budget upon joining the project).

## 2.16 CAE/PS - Aug '94 - Sept '94

Project Title: Communication Converter for the Radar Satellite Simulator (RSS)

Challenge: The Radar Satellite Simulator (RSS) required a proprietary serial data link to interface with the actual RSAT.

Role: Designer/Developer

Action: A previous attempt at implementing the Communication Converter using the Dos OS had failed. It proved too complex, unable to meet performance requirements, unreliable and months behind schedule. After evaluating the existing implementation a new design using QNX QUnix was undertaken. A 3<sup>rd</sup> party driver developer was sought out. The framework consisting of two processes was developed.

Technical Environment: The satellite downloads data at 500 - 100 000 bps using a proprietary (NASA) protocol. The Communications Converter is implemented as a standalone (QUNIX on a PC) unit that facilitates multiple data streams between the simulator and the test ground station. The simulator runs on a network of VAX workstations and communicates via Berkley Sockets with the converter.

Skills Used: QNX QUNIX, C, Sockets

Result: Within two months the core functionality was working reliably and operating at the required 100 000 bps with ease. The follow on work was finished within another month and delivered.

## 2.17 CAE/PS - Mar '94 - Aug '94

Project Title: DFORTS TACS

Challenge: To develop software to control target activation.

Role: Software Developer

Action: Developed the simulator aspect of the application. Debugged the serial communications driver.

Technical Environment: The DFORTS TACS pops up mechanical targets used for training army armored personal.

Skills Used: Ada, Dos, driver development, Rational Rose

Result: The simulation engine that executed the simulation script was implemented on time. Had to pitch in and take over the serial port driver. Within weeks this was up and running.

### **3. Time Group of Companies - Apr'91 - Feb'94**

Project Title: Fax Service Platform

Challenge: Develop new services to compliant existing services at Time IVR.

Role: Project Lead/Software Developer (Voice Processing Division)

Action: To develop the never busy fax service, the 800 Call Prompter VS&F for Bell Canada, and support existing CO class Voicemail for the government of Canada (15000 subscribers). Designed, managed and implemented the 800 Call Prompter VS&F for Bell Canada. The VS&F is an interactive voice response system that runs on a SCO Unix platform, written in C, and C++. Process control was used to implement software fault tolerance in this client-server application. Other duties included: diagnosing hardware and software problems, enhancing/introducing new voice processing applications written in a 4th GL, and providing considerable support for a 15,000 user voice mail system, reviewing technical content of ongoing contracts, and establishing technical procedures.

Technical Environment: Designed a fax service platform. The system provided Never Busy Fax and Fax mailboxes; a new offering by Time Communications. The system was designed as a distributed system (client-server).

Skills Used: SCOUNIX, C++, C, QNX, Foxbase, ksh, awk, general scripting

Result: The Never Busy Fax service was in the testing phase and would go into service within six months. The 800 Call Prompter VS&F for Bell was delivered in three months. It was under budget and on time.

### **4. Nomis Computer Systems Corp. - Jun '89 - Apr '91**

Project Title: Nomis Digital Seismograph/Hydrograph

Challenge: To enhance the Nomis 5200 Digital Seismograph including the introduction of an advanced multi-board hydrophone model. Debug the X.400 to Telex gateway.

Role: Software Developer

Action: Maintained and enhanced the application software used in the Nomis 5200 Digital Seismograph. The Nomis Digital Seismograph was enhanced into a twenty channel hydrophone recorder. Introduced a PC based communications package, used to remotely operate a seismograph, download recorded data. Nomis provided a X.400 email service to Telex gateway that failed when delivering large messages.

Technical Environment: The embedded firmware used in the Nomis 5200 Digital Seismograph was written in Z80 Assembler. The Nomis Digital Seismograph was enhanced into a new multi-board twenty channel hydrophone recorder. A PC based communications package was written to remotely operate a seismograph, download data and further analyze seismic data. This application program was written in C++ and ran on DOS. The X.400 to Telex gateway was written in C and operated on SCO Xenix.

Skills Used: Z80, 8086 Assembler, Embedded real time, C++, SCO Xenix 386, Dos

Result: The Z80 code was considerably enhanced, simplified and made modular. This allowed the code base to be used in multiple products without branching. The resulting multi-board twenty channel recorder was a success, delivered on schedule. The remote communications program was the first application I wrote in C++. It allowed the user to remotely access a seismograph, to configure it, check up on it and download collected data from it. The X.400 to Telex gateway

required modification to the flow control protocol between Xenix gateway server and the Telex modem.

## 5. Canadian Armed Forces - Oct '83 - Nov '87

Title: Naval Officer

Role: Systems Engineer

Action: Served as a Combat Systems Engineer in the Canadian Navy, specialized in systems engineering, including communications systems, navigational equipment, and the combat suite. Training included Computer Science, Electrical Engineer, and System Engineering.