David Benoit

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B.Sc., M.Math

EXPERTISE

Mentoring, Scalability, Data Privacy, Fault Tolerant Design, Payments, Remittance, Foreign Exchange, Treasury Management, PCI-DSS, GDPR, Fraud, Security

C++, Python, C, Awk/Gawk, Lex/Yacc, Tk/Tcl, SGML, HTML, XML, XSLT, JavaScript, SQL, LISP, FORTRAN, ProLog, Smalltalk, Maple, x86 Assembly, Perl, Visual Basic, Java, Unix Shell scripting

Boost, **STL**, SigC++, AJAX, GDK/GTK+, Gnome, X, IPv4, IPv6, JRun, .NET, CSS, Winsock2

emacs, **PostgreSQL**, MySQL, vi, git, SVN, CVS, RCS, Source Depot, SQL Server, Maple, HP OpenView, SNMP, GSuite, Libre/Open Office, Microsoft Office, Project, Visio, Lotus Suite, WordPerfect Suite, XRunner, dBase, Internet & Communications Software, etc.

HTTP, **TCP**, **UDP**, SIP, RTP, SMDI, FIX, PostgreSQL, MySQL, TDS, SNMP, H.323, H.225, Q.850, Q.931 and other proprietary and internal protocols

RIM 950/957/Blackberry, NMS (various models), Palm Devices, DAP Handhelds, Compaq iPaq, Microcomputers, Workstations, Peripherals, Serial Controllers, internetworking infrastructure

PROFILE

Professional technical leader, systems designer, developer and software consultant with over 20 years of industry experience specializing in highly robust, scalable, available, and configurable software. **Entrepreneurial** instincts combined with in-depth technical knowledge in a wide array of industries, and a drive to succeed in fast-paced and challenging environments. Extensive **teaching and mentoring** experience and a proven track record building teams, leading to results and success in high-stress and mission critical environments.

WORK EXPERIENCE

SENIOR VICE PRESIDENT: ENGINEERING
PayWith – 2021-present – Montréal, Québec / Remote

- Responsible for overall technology strategy and long-term vision
- Oversee creation of policies and procedures for Payment Card Industry Security Standard Council's Payment Card Industry Data Security Standard (PCI-DSS)
- Recruiting, mentoring, and management of lead staff in development, QA, and system operations
- Analysis and design of solutions for large / key client relationships

DIRECTOR: PAYMENT PLATFORM ARCHITECTURE
Zalando Payments – 2020-2021 – Berlin, Germany

- Investigation and evaluation to commercialize core payment functionality to merchants outside the Zalando marketplace
- Advisor to treasury management and risk assessment platform teams

CHIEF TECHNOLOGY OFFICER
Reach – 2013-2019 – Montréal, Québec / Remote

- Responsible for establishing the technological vision, leading the development, and overseeing all technical projects and resources
- Established data security and privacy policies, procedures, and best practices to ensure adherence to Know Your Customer (KYC) and Anti-Money Laundering (AML) regulations such as FINTRAC and CIP, the EU's General Data Protection Regulation (GDPR), and the Payment Card Industry Security Standard Council's Payment Card Industry Data Security Standard (PCI-DSS)
- Data Protection Officer, responsible for ensuring adherence with all legal, regulatory, and data protection requirements

AFFILIATIONS

Invited Expert – World Wide Web Consortium (W3C): Web Payments Working Group & Card Payment Security Task Force

Member – Association of Computing Machinery (ACM)

EDUCATION

M.Math, Computer Science
University of Waterloo

B.Sc. Honours, Computing Science
Dalhousie University

PRESENTATIONS

Panellist - Mobile Payments Conference: Setting the Standard for Secure, Seamless E-commerce Payments – Chicago – August 2019

Panellist – SymposiumX: Financial Innovation on the Web – New York – April 2019

AWS Montréal – EFS Tips & Tricks – Montréal – Nov 2018

PGConf - Migrating a live Postgres database into RDS with no downtime; Experiences and Lessons Learned – New York – June 2016

PostgresOpen - Object Oriented Approach to Data Driven Software Development – Chicago – September 2013

PostgresOpen – Middleware is Dead – Chicago – September 2012

- Establishment of data breach and disaster recovery protocols, and execution of bi-annual tests and audits to ensure readiness
- Recruiting, mentoring, and management of full technical team consisting of architects, engineers, administrators, and dedicated QA
- Administration of technical budgets, analysis of costs, and advising business stakeholders on technical project costs
- Design, implementation, and coordination of integration with acquiring banks, payment processors, and liquidity banks
- API design and implementation unifying all aspects of payment cards, wallets, and instant transfer methods
- Serverless design of front-end workload endpoints to facilitate cost-effective deployment and minimal administrative overhead
- Extensive experience working with clients during initial design, requirements analysis, implementation, and deployment

CONSULTANT
Pedestrian Crossing – 2009-Present – Montréal, Québec

- FIX to Filter feed handler for fixed income assets for Morgan Stanley written in C++ and Boost ASIO
- Investigation and prototyping of Bloomberg MPF protocol handler for Morgan Stanley writing in C++ and Boost ASIO
- Enterprise-scale system performance monitoring software for Morgan Stanley written in C++ and Boost ASIO
- Enhancements and modifications to Zabbix monitoring software (client, server, database, and protocol level) providing integration to the Morgan Stanley cross-platform build system
- UDP based multi-link aggregation, packet re-ordering, loss recovery and jitter correction for live broadcast quality HD video (H.264) streaming over 3G links written in C++ and Boost ASIO
- Parsing of PDF records for analysis and data visualization of chronological performance records
- jQuery extension to allow for user preference ordinal ranking input for multi-criteria decision making analysis

CHIEF TECHNOLOGY OFFICER & CO-FOUNDER
Starscale / 2006-Present – Halifax, Nova Scotia / Remote

- Real-time merchant payment system supporting credit-card (with and without 3-D Secure), localized payment cards and PayPal with built-in foreign exchange capabilities providing “like-for-like” settlement of currencies. Direct integration with Global Collect and Optimal Payments for payment processing and Royal Bank of Scotland (RBS MP) for foreign exchange settlement. Database support for reconciliation, and secure access for merchant XML requests via a symmetric SSL server
- Design and development of hierarchical binary protocol for use in transmitting and storing arbitrary tree structured messages. Development of associated C++ classes for easy use
- Development of an asynchronous socket library in C++ for use on multiple CPU architectures and operating systems complete with replaceable components at each level for testing and verification
- Asynchronous C++ library for direct access to MySQL dataservers using protocol version 10
- Database schema and stored procedure implementation for online account registration, confirmation, and subsequent lifecycle

ACADEMIA

Lecturer: Object-Oriented Programming in C++ – Faculty of Computer Science, Dalhousie University, Halifax, Nova Scotia – 2004

Lecturer: Computer Science for Health Professionals – Faculty of Computer Science, Dalhousie University, Halifax, Nova Scotia – 2004

Lecturer: Object-Oriented Programming in C++ – Faculty of Computer Science, Dalhousie University, Halifax, Nova Scotia – 2002

Lecturer: Cryptography and Network Security – Department of Math and Computing Science, St. Mary's University, Halifax, Nova Scotia – 2002

Teaching Assistant / Research Assistant – Department of Computer Science, University of Waterloo, Waterloo, Ontario – 1997-1998

Tutorial Leader / Marker – Department of Mathematics, Statistics and Computing Science, Dalhousie University, Halifax, Nova Scotia – 1995-1997

Program Assistant / Teaching Assistant – University Computing and Information Services, Dalhousie University, Halifax, Nova Scotia – 1994-1996

management
- MIME multipart message decoder designed to allow seamless streaming of received messages directly to end consumers or storage with no buffering
- Monitoring software in C++ to ensure that all necessary software for deployed services are running and available
- Creation of an posix-based C++ operating system abstraction layer to allow higher level applications to be written without specific knowledge of the operating system yet maintain performance
- Cross-platform C++ runtime environment and framework to allow for easy creation of services that conform to a flexible and standardized operational environment
- XSL automatic generation of stored procedure interface tests

SOFTWARE ENGINEER IV
Tekelec / Blueslice – 2010-2011 – Montréal, Québec

- VRRP and HSRP automated link failure detection and fast link switchover in for HA installations
- Automatic provisioning of PCRF profiles in response to PUR DIAMETER requests
- C++ SQL parser implemented with Boost Spirit with complete decomposition of complex queries to support automatic rewriting of queries during schema upgrades
- Development of a C++ framework to support generic RESTful web service backend systems
- Design and development of a cache management system to support fragmented database storage in C++
- Design and development of a high-performance generic template based in-memory object cache in C++
- Performance analysis, system optimization and build system optimization

SOFTWARE DEVELOPMENT ENGINEER
Microsoft – 2008-2009 – Redmond, Washington

- Automatic and transparent session re-establishment with minimal packet resends after unexpected connection loss
- Consolidation of TDS C++ data type definitions throughout the SQL Server engine to allow for easier maintenance and creation
- Specification of C extensions to the ODBC specification to allow for completely asynchronous usage
- Extensions to the C# SQL Server installation system to allow for on-the-fly application of patches to packages during installation

PRINCIPAL SOFTWARE ENGINEER
AOL – 2003-2007 – Halifax, Nova Scotia

- Host Media Processing Engine (SIP and RTP) written in C++ supporting full audio playback and recording control, DTMF interrupts and media hairpinning for transfers. This application, supporting a large number of concurrent sessions, allowed AOL Voice Services to deprecate a large and expensive hardware and TDM telephony based solution with a flexible scalable architecture requiring only stock Linux machines and IP connectivity
- Realtime C++ RTP Transcoder which converts live media streams between Speex, iLBC, GSM and PCMU codecs to allow narrowband

HOBBIES & INTERESTS

General Aviation, Book Binding, Travel, Ultimate, Cycling, Skating, Skiing, Racquetball, Swimming, Classical Music, Clarinet, Viola, Piano, Photography, Art, Woodworking, Home Renovations, Computer Graphics, Animation, Electronics.

PUBLICATIONS/AWARDS

Representing Trees of Higher Degree – Algorithmica, Vol. 43, Number 4, December 2005

Representing Trees of Higher Degree - Proceedings of the 6th International Workshop on Algorithms and Data Structures (WADS '99), Vancouver, Canada, August 1999

Compact Tree Representations - Masters Thesis, University of Waterloo, Waterloo, Ontario, November 1998

US Patent #7,110,748 B2: Telephone Call Manager

Deans List, Dalhousie University

VOLUNTEERING

École St. Gabriel School – Governing Board – Member (2011-Present), Chair (2012-2019)

English Montreal School Board – Parents' Committee – Member (2018-Present, 2012-2017), former vice chair and chair of various subcommittees

St. Columba House – High School Math & Science Tutor (2011-2015)

REFERENCES

Available upon request.

clients to connect to and use AOL Voice Services with minimal loss of voice quality
- Server-hosted C++ SIP conference server with hardware (NMS) audio mixing control
- C++ SIP rewrite server used to apply static rules for call routing, filtering, and load balancing
- C++ SIP stack designed for high capacity call processing and routing systems. Personally tested this completely asynchronous modular and extensible stack the industry integration and test event (SIPit20)
- C++ RTP stack designed to support numerous automated services as well as live person-to-person calling
- C++ Media streaming system for real-time voicemail screening in the AIM client
- C++ Web activated and controlled calling with full real-time asynchronous call control via AJAX
- Co-design of a per-minute incremental billing system for AOL Voice Services products
- C++ Phone Locale system for storing and retrieving locale information based on E.164 phone number prefixes
- Extensions to CVS to allow for integration with an in-house bug tracking system

VICE PRESIDENT & CHIEF TECHNOLOGY OFFICER
Invio Bioinformatics – 2002-2007 – Halifax, Nova Scotia

- Prototype software for indexing genetic sequences using compact trees in C++

SENIOR SOFTWARE DEVELOPER
J.J. MacKay Canada – 2002-2003 – Halifax, Nova Scotia

- Real-time data acquisition and terminal programming application in C++ on WinCE
- Established best-practices for software design, construction and Linux system administration

SENIOR SOFTWARE ENGINEER
AOL / InfoInteractive – 1998-2002 – Bedford, Nova Scotia

- Involved in a number of early stage prototype and production systems related to Internet and Telephony integration, including:
    - MWI (Message Waiting Indication) Gateway for large scale generic routing of voicemail indication
    - SMDI & ISVM Gateways for flow control and communication
    - Real-time multicasting system for call notification
    - H.225 gatekeeper
    - TCP "coupler" application to bridge arbitrary connections
    - Large-scale, high-performance server to provide presence management for UDP-based clients
    - Real-time event notification and action processing
    - Large-scale user profile management
    - Unix/Linux-based implementation for Internet Call Manager
    - Loss tolerant encrypted UDP communications protocol

and many more