Senior Gateway Developer Senior Gateway Developer Senior C++/ Python Developer Chicago, IL I am a Senior C/C++ 98/11/14, C#, Python developer with over 18 years (12 years financial/trading) experience in developing object oriented, data driven, real-time solutions. I have worked with multiple operating systems including Linux, UNIX, and Windows. I ve worked extensively with multithreading and asynchronous messaging to meet design requirements for low latency and high throughput. I have worked at nearly every level in the trading stack from exchange gateways to algorithms to GUIs. I have a solid quantitative background stemming from coursework, as an undergrad, in econometrics and recent coursework in the CFA program (Level II Candidate). I have also studied the pricing, valuation, and risk profiles of a number of different asset classes and derivatives including futures, options, swaps, fixed income and currencies. I have a passion for programming combined with a passion for understanding the underlying financial domain. Authorized to work in the US for any employer Work Experience Senior Gateway Developer Eagle Seven June 2015 to April 2017 Developed gateways to facilitate the arbitrage of CDS Index Futures through the Bloomberg FIX API the GFIC, and ICE APIs. Upgraded the firm's Asian gateways (OSE and TOCOM) to the new OMEX-JGATE platform Upgraded the firm's Eurex gateways from 2.5 - 3.0 - 4.0. Developed Python scripts to analyze and histogram log files of performance metrics. Developed a testing framework in Python to automate testing of disparate exchange gateways by generating order routing scenarios from XML scripts. The python clients generated binary TCP/IP messages consistent among gateways which were then translated to the gateway API and forwarded on to the exchange. Developed python scripts to replay market data captured by wireshark in .pcap files to our different gateway market data feed handlers. Technologies: C++ 98/11/14, STL, boost, Python, GNU tool chain, Git, TeamCity, Visual Studio, Windows, Linux Senior C++ developer FX Platform Merrill Lynch July 2014 to March 2015 Maintained and developed enhancements for Merrill's global electronic foreign exchange market making system. The system is a FIX protocol server used by retail and institutional traders worldwide to trade spot, forward, and other currency derivative contracts. Technologies: Linux Red Hat Enterprise, C++ 98/11, STL, boost, GNU tool chain, Sybase, Mercurial Consultant Python/C++ Developer Merrill Lynch October

2013 to January 2014 Exposed and integrated Merrill Lynch's futures and options clearing data to their global risk management platform, Quartz. The Quartz platform is written entirely in C++ and python and is envisioned as the future of integrated risk management for B of A and Merrill Lynch's global operations. Integrated Sunguard's GMI F & O clearing platform with the Quartz system using a combination of Python, and ODBC to provide an in-memory representation of GMI data to be consumed by Quartz clients. Technologies: Python, Quartz (Sandra, HUGS, DAG, pyodbc, QzPos, DealBooker etc.), ANSI SQL, DB2, GMI, Agile Consultant Senior C++ Developer NYSE-Euronext July 2012 to October 2013 Re-architected and optimized NYSE's Archipelago matching engine code base for the Euronext platform. The architecture implements and accesses a real-time database in shared memory utilizing the POSIX IPC APIs. This allows efficient sharing of trade and quote data between the matching engine and the peripheral processes that rely on it to disseminate quote, order and trade reports to a variety of counterparties. Technologies: Linux (Red Hat Enterprise), C++, Java, JDBC, STL, POSIX IPC (shared memory, semaphores), POSIX threads, BSD, valgrind, Coverity Consultant Senior C++ Developer Ronin Capital March 2009 to April 2012 Developed a number of exchange connectivity libraries for Ronin Capital's legacy options market making platform. Specifically, an implementation for the CBOE's CORBA API, CMI; an implementation for Eurex's ETS API; and an implementation of ISE's direct market API. All libraries supported multithreading to quote option chains of multiple underlyings simultaneously. Technologies: C++, STL, ACE, Boost, CORBA, multithreading, sockets Consultant C++/.NET Developer ITG April 2008 to March 2009 Developed an execution platform for a statistical arbitrage trading algorithm simultaneously trading up to 500 pairs of equities. The application was developed for the Linux platform in C++. Developed a point-and-click futures and equity trading application front-end in C# Winforms 2.0. The application view employed an Infragistics UltraGrid control to display prices and market depth. The model supporting the view used synchronized threads to write real time price and order data to ADO.NET data tables and asynchronously read the data to update the grid. Technologies: WinForms, C# .NET 2.0, C++, STL, VS 2005, CVS, Eclipse, Qt 4, Linux Fedora Distribution, Infragistics, Subversion, LBM Consultant C++/.NEY Developer Bear Stearns

September 2005 to March 2008 I worked on a team to develop an integrated platform for trading equities, options, futures and fixed income securities. The desktop client was developed for the .NET platform using C# and WinForms and a number of custom 3rd-party control suites including Infragistics and ChartFX. The application was supported by a couple of native VC++ COM components that interfaced with the streaming data providers and the iSeries boxes responsible for execution of orders on the exchanges. I was directly involved in both the .NET desktop and the development and extension of the COM component that communicated with the iSeries boxes to support remote clients using a Tibco implementation. This added significant value to the end-product due to the revenue it could generate from clents. Technologies: .NET, C#, WinForms, Infragistics, VC++, COM, STL, ATL, winsock, Tibco EMS, multithreading, AS-400 iSeries, FIX Further experience can be provided if required. Education BA in Economics University of Toronto Diploma in Applied Information Technology Information Technology Institute Skills .NET (5 years), C (10+ years), C+ (10+ years), Python (3 years), Linux (5 years) Additional Information TECHNICAL KNOWLEDGE Operating Systems: Linux SUSE, Red Hat Enterprise 5, Fedora 11 - 21 distros, Windows NT server 2012, UNIX SUN Solaris 8 Languages: C++ 98/11/14, Python, C#, R, T-SQL, PL/SQL, XML, BASH Databases: SQL Server 6.5, Oracle 8.0 and 7.3, postGres Technologies/Libraries: STL, Boost, Quartz, multithreading, LBM, WireShark, Multicast Hammer, Win32, winsock, wininet, git, MQ-Series, Tibco, VS .NET, VS 2005, 2008, 2013 QT 4, Eclipse, NUnit, CPPUnit Protocols: TCP/IP, UDP, FIX, FAST, OMEX

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