

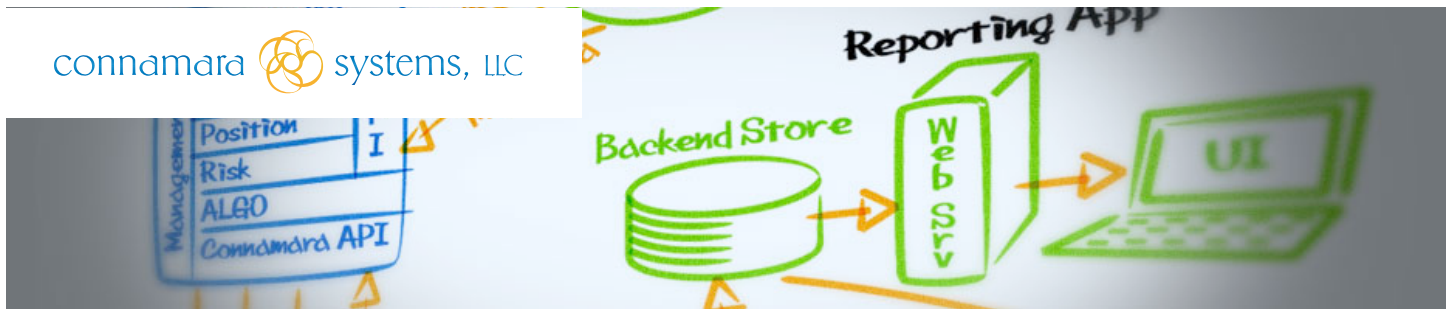
+ Product Fact Sheet **HFT Framework**

The Connamara HFT Framework is a made-to-measure solution that provides all the functionality necessary to create low latency high throughput High Frequency Trading application. The HFT Framework allows development teams the ability to translate a proprietary trading idea into a production system. The framework is a collection of Connamara Trading Stack components that when tied together with the Connamara Erlang Messaging Middleware and provides the foundation necessary to create low latency, robust High Frequency Trading applications.

Functionality:

The functionality currently offered by the Connamara HFT Framework is listed below.

Functionality	Description
Aggregate Position Tracking	Aggregates trade reports from multiple algorithms into consolidated positions.
Profit and Loss Tracking	Updates and displays position profit and loss in real time using live market data.
Algo Risk Management	Can be customized to the Algorithm being implemented. Risk limits can be set by administrator and adjusted lower by trader.
Algo Position Tracking	Algo can keep track of it own position and have access to firm wide positions for overall view of risk (short sale tracking)
Algo Transaction Management	Algo manages state of orders entered into market.
Algo Command and Control (C2)	Algo receives command messages from Trader (start, stop, parameter changes)
Algo Information Reporting	Algo reports to system: <ul style="list-style-type: none"> + Orders and Order State Changes + Fills + Order Rejections + Algo Status + Algo Limits

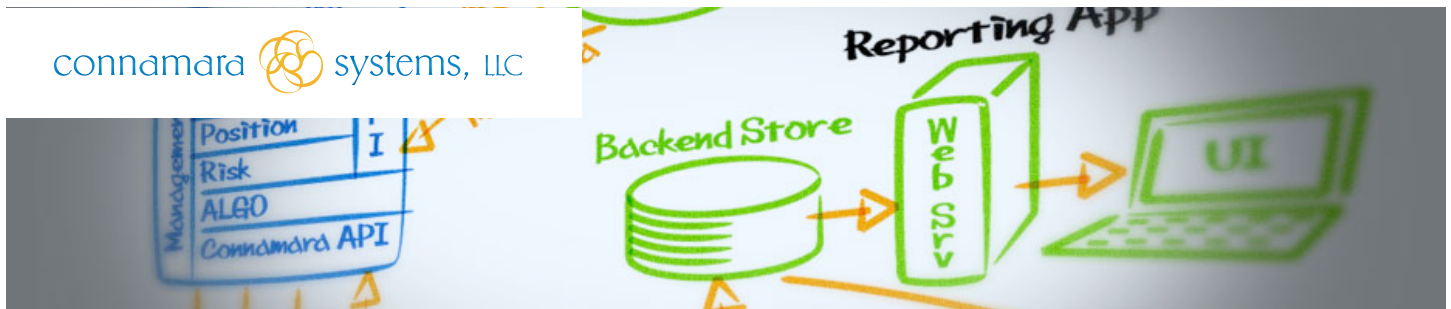


Functionality	Description
Algo Environment Management	Algo stops and cancels open orders when it perceives an unknown state (rejected order), loss of connections (order routing, market data, C2).
Trade Report Normalization	Converts venue and asset class trade reports to a common format for aggregation
Exchange/Venue Connectivity	<ul style="list-style-type: none"> + CME + ITG + Currenex + Merrill + Interactive Brokers
Multi-Asset Support	<ul style="list-style-type: none"> + FX-Spot + Equities + Futures
Market Data Vendor Support	<ul style="list-style-type: none"> + Activ Financial + Wombat + ITG + Connamara FX Market Data Adapters

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Technology:

The Connamara HFT Framework uses C++ for server components, Erlang for the the messaging and C# for real-time user interfaces. A browser based user interface is provided for non-real time reporting, administrative tasks and system monitoring. The Framework currently is supported on LINUX for server side components and Windows for the real-time user interface applications.

Functionality	Description
HFT Stack	Provides framework to host algorithmic trading decision making code. Includes: <ul style="list-style-type: none"> + Transaction Management + Position Management + Risk Management + Command and Control Interface + Market Data Connectivity + Order Routing Connectivity
Connamara CHAMP middleware	Distributed, scalable messaging Framework designed for concurrency and fault tolerance implemented in Erlang.
Connamara API	Allows interested consumers and producers of messaging information to communicate via the CHAMP middleware. Allows new consumers and produces to be easily added to the Framework. Available as C++, C# and Ruby implementations.
Position Server	Computes position quantities and costs from normalized executions. Publishes positions for interested consumers.
Data Store Recorder	Saves all executions and positions to a data store for recovery and offline analysis.
Data Store Publisher	Used for recovery and publication of static data at start-up.
Real-time User Interfaces	Displays orders, positions, executions, Algorithm status. Allows users to set-up and control algorithms.
Browser User Interface	Allows users to search orders, executions and positions and export saved data for offline analysis.



HFT Framework Diagram:

The diagram shows HFT Framework configuration

