



S&P 500 (Weekly) 1.68

ActiveMargin™

The Preferred Margining Solution

ActiveMargin™ is a multi-currency, multi-asset, real-time, portfolio margining system. By computing portfolio margins even before trades take place, ActiveMargin™ provides robust pre-trade compliance and unsurpassed increase in trading space for clients. It is an important component of any online trading system and has been designed to work in environments with high trading intensities. ActiveMargin™ additionally offers real-time value-at-risk computation for a range of asset classes, including equities, money market instruments, bonds, derivatives, forex and commodity assets.

ActiveMargin™ is a comprehensive suite ideal for central deployment integrated with the order routing system and the back office of an organisation. The framework is designed to:

- Φ Provide pre-trade compliance to regulatory requirements on portfolio of securities and derivatives
- Φ Provide pre-trade compliance to internal trading and risk policies on portfolio of securities and derivatives
- Φ Monitor initial margin, variation margin and risk (as VaR) in real-time as trading proceeds
- Φ Increase trading space through extending the power of portfolio margining to unexecuted orders
- Φ Compute portfolio margins using value-at-risk methods in any portfolio of instruments, including unlisted securities and derivatives
- Φ Allow for cross-margining across underlying securities
- Φ Serve as a real-time rules engine to regulate trades
- Φ Provide real-time risk analytics to traders and to risk managers
- Φ Allow stress testing and back testing of risk parameters used

Supported Methodology

ActiveMargin™ provides two distinct sets of risk and margin computational methods the regulatory methods prescribed by the respective exchanges for portfolio margining; and the value-at-risk method that can be used to compute the risk of a portfolio comprising both exchange traded and unlisted securities.

Regulatory Methods

Regulatory margin methodologies supported include:

- Φ TIMS® based Customer Portfolio Margining method developed by the OCC
- Φ SPAN® of CME (used by over 60 leading derivative and stock exchanges of the world)
- Φ Eurex Margin System, a derivative of TIMS®

TIMS®

Customer Portfolio Margin method is based on TIMS® of OCC, which uses percentage up and down moves to compute possible profit and loss values. ActiveMargin™ is capable of using data from OCC profit and loss files to compute regulatory margin. Apart from computing margins on traded positions, ActiveMargin™ can go one step further and compute portfolio margins taking into account unexecuted orders

SPAN® of CME

SPAN®, a regulatory portfolio margin methodology developed by the Chicago Mercantile Exchange, is used by over 60 leading security markets in the world, including:

- Φ Euronext LIFFE
- Φ Chicago Mercantile Exchange
- Φ Chicago Board of Trade
- Φ Canadian Derivatives Exchange
- Φ Singapore International Monetary Exchange
- Φ Tokyo Stock Exchange
- Φ New York Futures Exchange
- Φ London Metal Exchange
- Φ NYMEX

ActiveMargin™ is capable of using the risk parameter files provided by the respective exchanges and can compute margins in line with SPAN® methodology. ActiveMargin™ does better than SPAN® in terms of speed and in accounting for unexecuted orders.

Eurex Portfolio Margin Scheme®

This is a derivative of TIMS® methodology and is developed and used by Eurex to margin a whole range of instruments and derivatives traded in that exchange. ActiveMargin™ supports this methodology, uses the same risk parameter files as provided by Eurex, but extends the application to account for unexecuted orders.

Value at Risk Methods

Value-at-Risk can provide cross-margining across underlying securities. To provide for a selective approach in cross-margining, ActiveMargin™ allows risk managers to set up margin groups, and permits cross-margining only within these groups. The supported VaR methodologies are:

- Φ Monte Carlo Simulation
- Φ Historical Simulation
- Φ Hybrid Simulation
- Φ Grid Simulation (using pre-specified stress points similar to TIMS®)

Monte Carlo Simulation

ActiveMargin™ uses a full valuation Monte Carlo simulation. The system has been optimized for real-time performance. The simulation process has been decoupled from the real-time processes thereby providing high throughput.

The default distribution used in Monte Carlo is Gaussian. However the system provides the user the option of selecting between the following distributions.

The user can also incorporate other distributions to meet specific requirements. These can be developed and incorporated on request.

Monte Carlo simulation is recommended as the best method for Value-at-Risk computation. It offers exceptional flexibility in designing a risk management system. The main concern for implementing Monte Carlo simulation is the operational speed and the ability of the implementation to provide real-time performance. ActiveMargin™ has been designed and architected to address this limitation.

Historical Simulation

ActiveMargin™ computes Value-at-Risk using Historical Simulation for all supported asset classes. Historical Simulation is a popular method for computation of Value-at-Risk figures for a portfolio. This method computes the Value-at-Risk figures based on the historical price movements of the underlying risk factors. The accuracy of this method depends on the selected time window of the historical prices. This method, however, is limited by the fact that it does not capture changes in volatility.

Hybrid Simulation

The Hybrid Simulation is a modification to and an improvement on historical simulation. This method adjusts the change in prices of the underlying risk factors over the time period considered for volatility changes. The volatility updation is done using Exponentially Weighted Moving Average method.

Grid Simulation

This is similar to the TIMS® methodology, where the simulation points above and below the last traded market price (the stress range and the number of intermediate points) are pre-specified. ActiveMargin™

Φ Simulates the price points at each of the intermediate up and down values within the stress range specified

- Prices instruments at each of these points
- Options can be priced using Black and Scholes or the binomial model

Φ Has pricing tools for many other derivative and interest rate instruments

Φ Provides margin offsets to the existing open position of the portfolio, taking into account pre-defined correlation groups (portfolios).

Computation of Volatility and Correlations

For the Monte Carlo and Hybrid Simulation methods, the user can select between different methodologies for computation of the stochastic volatility figures. The support methodologies are:

Φ Simple Moving Average

Φ Exponential Weighted Moving Average

Φ GARCH (1,1) GARCH parameters to be input to the system.

The time window for computation of volatility is a user-defined parameter.

Implied volatilities for options are computed from an implied volatility surface derived for each underlying security.

This ensures that the implied volatilities used in the simulated scenarios are in line with those observed in the market.

The following configuration parameters are available for the VaR methodologies:

Φ Look ahead days (typically 2, the maximum number of days required to collect initial margins).

Φ Confidence Level (typically 99%).

Φ Number of scenarios to be simulated.

Φ Decay factor for weighting older volatilities.

Φ Random number generation method (for Monte Carlo).

Φ Window for computing volatility and correlations (for Monte Carlo).

Asset Classes Covered

For the purpose of regulatory portfolio margining, ActiveMargin™ supports all asset classes traded at the supported exchanges. For the purpose of VaR margins, it supports the following asset classes:

Equities

- DVP Trades
- Contracts for Differences

Forex Trades

- Contracts for Differences

Commodities

Exchange Traded Options

- Equities
- Indices
- Commodities

OTC Instruments

- Debt instruments
- Interest Rate Swaps
- Currency Swaps
- Interest Rate Forwards
- Interest Rate Caps, Floors, Collars
- Currency Options

Exchange Traded Futures

- Equities
- Indices
- Commodities
 - Financial Futures
 - Short Term Interest Rate Futures
 - Notional Bond Futures
 - Swap Notes
 - Swap Rates
 - Overnight Indexed Swap Rates (like EONIA)
- Most other exchange traded futures

Real - Time Risk Control

Business Rules

The Business Rules module of ActiveMargin™ allows users to set checks and balances for different clients of the organization. Some of the business rule categories are

- ⊕ Position limits on securities
- ⊕ Restrictions on a particular security for a client
- ⊕ Prohibition on Buy and Sell orders for a client
- ⊕ Restrictions on taking naked short option positions
- ⊕ Instrument or security-wise rules for each client
- ⊕ Limit on single transaction value (to catch 'fat finger' errors)

ActiveMargin™ checks every incoming deal request for compliance with business rules. Changes to business rules made through the administrative front end of ActiveMargin™ take effect immediately. It is thus an effective tool to minimize risk when there are sudden large market moves.

Margin Limits

The margin represents the amount of money payable to the exchange as per regulatory requirement, and is usually higher than the value-at-risk. The Margin Limits is generally tied to a multiple of the equity in the client's account. The multiple is sometimes called the 'leverage' given to the client.

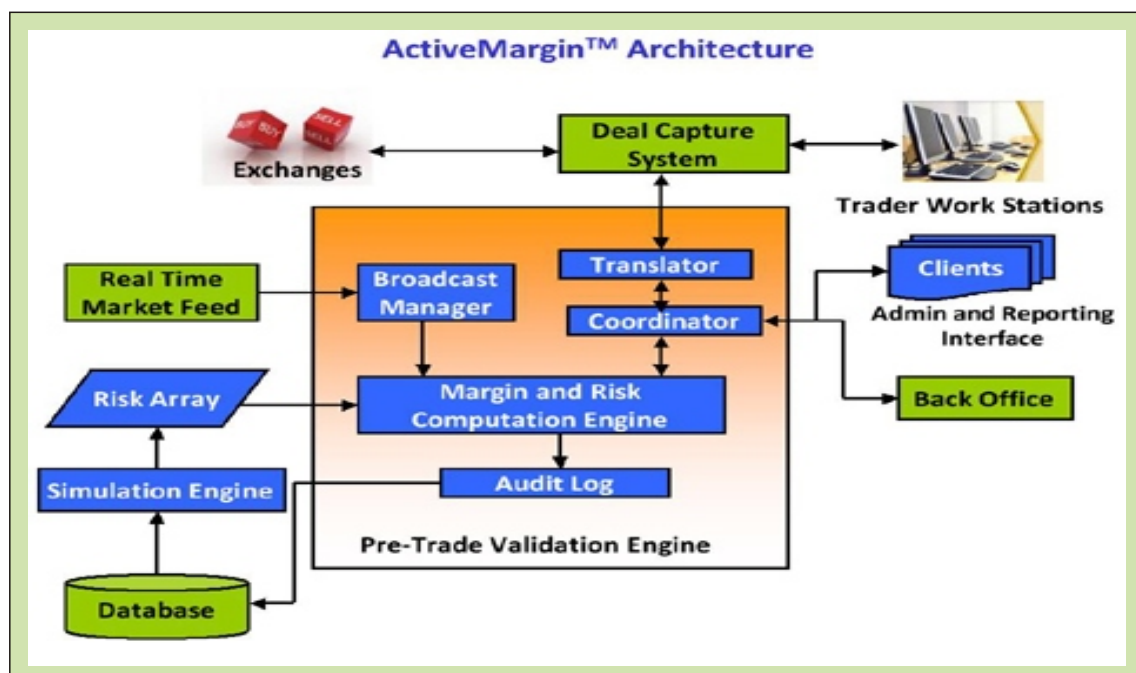
VaR Limits

The VaR Limits are generally tied to the equity in the client's account. Since VaR represents the actual risk in the client's position, it is not prudent to extend any leverage when checking for VaR compliance. The risk manager can specify the look-ahead days for this computation. For instance, if the margins become payable the next day, the risk manager might set the look ahead days to 2.

Multiple Entity Hierarchy

It is possible to define a hierarchy for risk check. A typical 2-tier hierarchy might contain the trader at the lowest level and the security firm itself at the next level. ActiveMargin™ typically performs all of the above 3 checks, viz. the Business Rules, Margin and VaR checks over the entire hierarchy. In such a case, the compliance engine of ActiveMargin™ expects the order to pass all the 3 levels in each of the hierarchies before an order is accepted. In the hierarchy scenario described, ActiveMargin™ checks for equity at the client level, and for overall limit availability at the firm level. The number of levels in a hierarchy is flexible, and can be defined by the user.

Architecture



About Chella Software

Chella Software is a capital markets specialist. All of our business has come from this domain, since inception. The combined experience of the team in the areas of front, middle and back office operations is probably unmatched. Highly respected as consultants and solution providers, enterprises rely on our products to run their mission critical business processes.

For more information visit us at www.chelsoft.com or write to subbu@chelsoft.com.



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