



Caplin Trader 1.3

Overview

August 2008

CONFIDENTIAL

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1 Preface

1.1 What this document contains

This document contains a business and technical overview of Caplin Trader version 1.3.

The first two sections, “About Caplin Trader” and “The user experience”, explain what Caplin Trader is and the benefits to your business of using it. The remainder of the document (“Behind the scenes”, “Caplin Trader out of the box”, and “Creating your own Caplin Trader”) contain more technical information about the product.

1.2 Who should read this document

This document is intended for anyone who requires an overview of what Caplin Trader is and how it can be deployed in a financial asset trading system.

Its readership includes:

- ◆ Business Managers
- ◆ Technical Managers
- ◆ Enterprise Architects
- ◆ System Architects
- ◆ System Administrators
- ◆ Operators
- ◆ Software Developers

1.3 Related documents

- ◆ **Caplin Platform Overview**

This document gives a technical overview of the whole Caplin Platform.

- ◆ **Caplin Trader Architecture**

This document describes in detail the architecture of Caplin Trader. It also identifies the areas where Caplin Trader can be integrated with a company’s own and third-party systems.

- ◆ **Caplin Trader Development Suite**

Describes the Caplin Trader Development Suite, which is designed to allow you to develop a trading system based on Caplin Trader technology.

1.4 Feedback

Customer feedback can only improve the quality of our product documentation, and we would welcome any comments, criticisms or suggestions you may have regarding this document.

Please email your thoughts to documentation@caplin.com.

1.5 Acknowledgments

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2 About Caplin Trader

Caplin Trader is a complete framework for building multi-product financial trading portals. It allows you to offer your clients trading access to a broad range of products via a single Web front-end.

Caplin Trader delivers a sophisticated trading screen direct to users' desktops, with nothing to install and no changes to security settings or firewalls. Users can access it from a standard browser, and its highly configurable user interface is easy to customize and extend to meet your exact needs.

The following pictures show typical Caplin Trader Client pages for Caplin Trader implementations that have been configured for FX trading and for bond trading, and a customized page that contains both FI and FX instruments.

G8 & Emerging

Currency	Rate
USDCAD	1.0031/1.0040
EURUSD	1.5682/1.5700
USDJPY	102.25/102.27
USDRUB	23.546/23.552
GBPUKD	1.9951/1.9955
GBPCAD	2.0013/2.0035
GBPEUR	1.2748/1.2766
GBPJPY	204.01/204.08
GBRDZ	150.03/150.15

Europe & E Europe

Currency	Rate
EURUSD	1.5682/1.5700
GBPUKD	1.9951/1.9955
GBPEUR	1.2748/1.2766
EURCHF	1.5694/1.5719
EURNOK	7.9729/7.9871
EUREK	9.3559/9.3684
EURDKK	7.4883/7.4987

Trade Panel

Add Currency Pair: EURUSD Account: acct1

EURUSD	GBPUSD	USDAUD
Sell 1.56 31 50 Buy	Sell 1.99 51 55 Buy	Sell 1.08 51 54 Buy
EUR 500K	GBP 500K	USD 500K
26 Aug 2008 20MIL RFS	29 Aug 2008 20MIL RFS	29 Aug 2008 20MIL RFS

Treasury Price Trend

US 30Y TREASURY YIELD HISTORY July 2007

EURUSD Price History

EURUSD Price History 2007

Major

Currency	Rate
EURUSD	1.5631/1.5650
USDJPY	102.25/102.27
GBPUKD	1.9951/1.9955
USDCHF	1.0035/1.0037
AUDUSD	0.9213/0.9215
USDCAD	1.0031/1.0040
NZDUSD	0.7842/0.7846
EURJPY	159.92/160.16
EURGBP	0.7326/0.7337
EURCHF	1.5694/1.5719

FX Blotter

ID	Currency Pair	Dealt Currency	Status	B/S	Amount	Rate	S/D	Account	T/D	Time	User
1219843902183	USDCAD	USD	Done	BUY	500,000	1.0022	28 Aug 2008	CUSTOMER1_EUR_COVERED	27 Aug 2008	14:41	user1
1219843902180	USDAUD	USD	Done	SELL	500,000	1.0851	29 Aug 2008	acct1	27 Aug 2008	14:41	user1
1219843902177	EURUSD	EUR	Done	SELL	500,000	1.5682	29 Aug 2008	acct1	27 Aug 2008	14:41	user1

POWERED BY CAPLIN

Connected

Waiting for http://localvm.caplin.com:50180/RTTP-TYPE5?X-RTTP-Type5-Pad-Length=4096&domain=caplin.com&uniqueid=1219

Internet 100%

Caplin Trader Client (FX trading)

Caplin Bond Trader - Mozilla Firefox

CAPLIN trader

Key Rates

Symb	Last	Change
Dow	13,465.67	+12.77 (+0.35%)
Nasdaq	2,347.00	+0.00 (+0.00%)
S&P 500	1,517.38	+0.00 (+0.00%)
10 Yr Bond	4.57%	+0.00
NYSE Volume	2,366,334,000	
Nasdaq Volume	2,365,320,000	
USD to Yen	121.29 Y	+0.00%
USD to Euro	0.7407 €	+0.00%

Stock Quote

IBM (NYSE)	Now	Price Change	Percent Change
\$54.25	0.05	0.097%	

More>>

Bond Market News

Malaysian Bonds Gain on Supply Squeeze
With fewer supply, the market is heading for lower yields," said Syed Hashim Aslam, head of bond research at KAF Research Sdn. in Kuala Lumpur.

DaimlerChrysler Bonds Rise Plan to Sell Chrysler
Not a good time for bondholders," said Glenn Reynolds, chief executive officer of bond research firm CreditSights Inc. in New York.

Merrill Lured for Bear in Mortgage Market That Humiliated It
"The best time to get in is when things are horrible," said Anthony Sanders, former director of mortgage banking at Deutsche Bank, who now is a finance Goldman, Merrill Almost 'Junk,' Their Own Traders Say

"...have made a lot of money securitizing paper over the years in a leverage boom time," said Richard Hofmann, an analyst at bond research firm CreditSights.

Blackstone Considers \$20 Billion Bid for Sallie Mae

Bond Data

ACE 5.699 15/00/2017 100.853/100.868

Coupon:	5.699999009265	Coupon Type:	FIXED - S/A 30/260	Issuer:	MCDONALD'S CORP
Maturity:	15/00/2017		NON-EOM	Issuer Type:	Retail - Restaurants
Dated Date:	4/2/2002			Country:	US
First Coupon:	10/30/2002			Currency:	USD
Amt Issued:	250,000	Outstanding:	100,000	CUSIP:	580113MDS0

Done

AAA Euro Bonds Med Maturity

Name	Coupon	Date	Bid	Ask	Net Chng	Bid Yield	Ask Yield	B/mkt Yield	NetChg	Asset Spread	Asset Spread
EIB	5.75	15-Jul-09	102.18	102.26	0.08	4.598	4.555	-0.043	16.6	-8.5	-5.1
COLONNADE	4.25	15-Jul-09	99.11	99.3	-0.18	4.719	4.618	-0.081	29.4	3.8	2
CDC IXIS	5.8	21-Jul-09	101.85	102.06	-0.01	4.825	4.737	0.009	40	14.5	9.3
SNCI	6.75	22-Jul-09	103.85	104.05	-0.01	4.729	4.627	0.009	30.4	4.9	-2.5
GE CAP EURO FNDG	3.75	22-Jul-09	98.92	98.96	-0.04	4.639	4.555	-0.01	16.7	-4.2	-4.2
CAESA DEPARIS	3	31-Jul-09	96.923	96.963	0.033	4.639	4.557	-0.01	16.4	-9.2	-10.9
GE CAPITAL CORP	5.625	20-Aug-09	101.54	101.74	-0.29	4.228	4.728	0.196	49.4	15.6	30.1
SNCF	4.625	25-Oct-09	100.03	100.23	0.14	4.601	4.598	-0.005	18.1	-8.8	-10.3
CRH	4	25-Oct-09	98.45	98.71	-0.18	4.716	4.593	0.088	29.1	2.9	-9.7
ARIES VERMOGENS	7.75	25-Oct-09	102.316	102.416	0.089	4.657	4.612	-0.048	23.2	-2.6	-2.2
EUROFIMA	5.75	27-Oct-09	98.362	98.362	0.079	4.624	4.624	-0.036	19.9	-6.4	-8.8
BAY LANDES GIRO	3.875	02-Nov-09	98.362	98.362	0.079	4.624	4.624	-0.036	30.7	5.8	8.6
EUROFIMA	5.625	18-Dec-09	102.2	102.3	0.34	4.601	4.598	-0.005	12.1	-14.9	-11.8
GERMAN PST PEN 2	3.75	18-Jan-10	97.894	97.994	0.064	4.664	4.597	-0.022	15.2	-5	-6.5
GE CAPITAL CORP	4.375	20-Jan-10	99.537	99.607	0.069	4.647	4.598	-0.012	18.6	-4.3	-3.5
VAUBAN MOBSTAR	3.125	28-Jan-10	96.27	96.37	0.14	4.694	4.65	-0.059	21.3	0.3	0.3

World News

- > Defendants Acquitted in Swissair Trial
- > Oil Prices Climb Above \$66 a Barrel
- > Koreas Debate Mineral Exploration Rights
- > Officials Say TD Ameritrade Open to Deal
- > Market Overview: Wed 4:20 PM
- > 2-Dip in Abhold Q1 net, sees recovery ahead
- > United Retail May same-store sales rise 4 pct
- > 1-UTI Worldwide net profit falls in first quarter
- > U.S. stock futures point to recovery on Wall St
- > Oil near 9-month high on Turkey Iraq raid
- > European shares near 3-week lows on rate worries
- > Global stocks and bonds pressured by rate worries
- > Gold edges higher on oil, Tokyo futures follow
- > Market Overview: Wednesday 4:20 PM
- > 2-Dip in Abhold Q1 net, sees recovery ahead
- > United Retail May same-store sales rise 4 pct
- > 1-UTI Worldwide net profit falls in first quarter

Treasury Yield Curve

Caplin Trader Client (bond trading)

The screenshot displays the Caplin Trader Client interface with several windows open:

- US Treasuries Automobiles**: A table showing US Treasury bond details like Description, Coupon, Maturity Date, Bid Yield, Price, and Ask Yield.
- Euro Benchmarks US Benchmarks**: A table showing Euro and US benchmark bond details.
- FI Tree**: A tree view of financial instruments categorized under root, Bonds, EUR, GBP, JPY, USD, Corporate, Automobiles, and Banking.
- Major FX Emerging**: A table showing currency exchange rates.
- Trade Panel**: A panel for managing currency pairs (EURUSD, GBPEUR, USDJPY, AUDUSD) with sell/buy prices and volumes.

Caplin Trader Client (FI and FX instruments in the same layout)

2.1 Business benefits

In recent years, the demand for electronic trading has expanded rapidly throughout the financial markets. In keeping pace with this, firms have tended to implement e-trading systems piecemeal, product group by product group, and sometimes even desk by desk. Direct client connectivity, while increasingly important, is often limited and product-specific. And it is not unusual for a firm to offer multiple front ends even for trading a single product.

This has resulted in fragmented offerings, in which a client trading with a single dealer may have to find his way around several uncoordinated access points when moving from pre-trade to trading to post-trade and from one product to another. This can make it complicated and inconvenient for clients to do business with you, driving them towards other channels and other dealers.

Caplin Trader is a client connectivity platform that gives your users a single integrated view of all your execution and information silos. It connects easily to existing data and trading systems to deliver a trading supermarket stocked with everything you have to offer, accessed via an exceptionally powerful and intuitive browser-based display.

The result is a more convenient, efficient and attractive offering, improving client acquisition, client retention, deal-flow and margins.

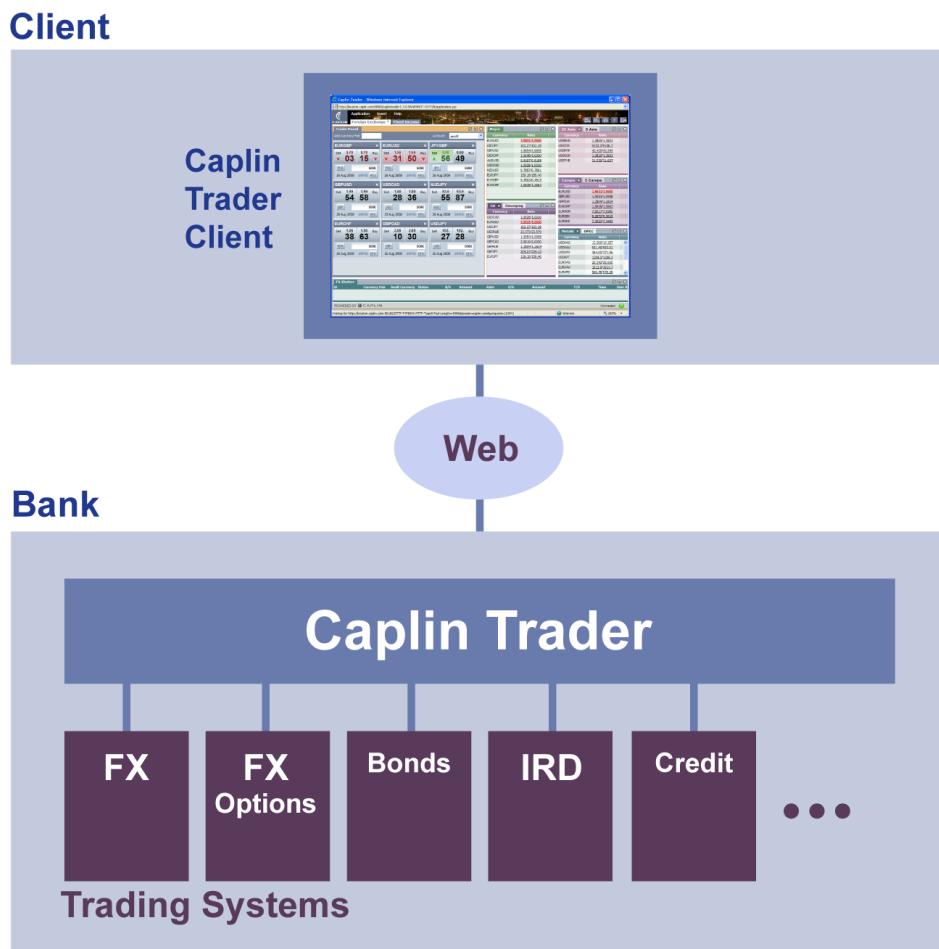
When used as an online trading portal for a single product, Caplin Trader delivers a high-quality and compelling user experience. When used across multiple silos, it offers seamless integration and a unified presentation that transforms diverse e-trading systems into a coherent suite of online client trading solutions.

Key benefits include:

- ◆ Simple and painless client on-boarding, with access as easy as viewing a web page.
- ◆ High user satisfaction thanks to the powerful, intuitive front-end.
- ◆ Unified view of your cross-product inventory, data and execution capabilities, without having to change back-end systems.
- ◆ Incremental deal flow, through seamless transition from pre-trade stimulus to execution.
- ◆ Ability to capture and internalize cross-product trade flow which would otherwise migrate to rival platforms.
- ◆ Ability to create a unique offering, with content, styling, and branding easily customized to your design.
- ◆ Highly cost-effective scaling to large user numbers and high data rates.
- ◆ Short time to market, thanks to powerful integration and deployment tools.
- ◆ Quick and easy addition of new products, trade models, and resources.
- ◆ Easily configured as a “white label” offering.

2.2 How it works

Caplin Trader's components are located on both client and bank platforms, and integrate seamlessly with your existing trading systems, as shown below.



Caplin Trader – Architectural Overview

Caplin Trader Client is a Web application that provides a rich trading workstation in a browser. Its drag-and-drop framework includes a set of standard components such as grids, trading panels, trade blotters, trading tickets, product search, charts and news displays. You can also

- ◆ create your own display components using Ajax, Flash®/Flex™ or any other rich internet application technology,
- ◆ easily customize the appearance of Caplin Trader Client pages,
- ◆ configure the trading logic to match any trade model,
- ◆ incorporate any other Web content into the Caplin Trader Client,
- ◆ include content from third-party Web-based services

The rest of the Caplin Trader software executes on the bank's hardware. Much of this software is part of the **Caplin Platform**, a real-time Web delivery system for market data and trading that has massive scalability, reliability, and low latency.

These major components combine to produce a complete online trading platform, which can be customized and extended to meet your precise requirements using the configuration options, APIs, and SDKs provided.

3 The user experience

Caplin Trader delivers a truly superior end user experience. It has the rich set of features, functionality and performance usually associated with real-time trading applications that are installed on the desktop.

Because the Caplin Trader Client runs in a standard Web browser, once users have registered and been permissioned for trading they can start trading straight away; there is no additional client software to be installed or configured on the desktop machine.

The user interface provides “windows” style interaction.

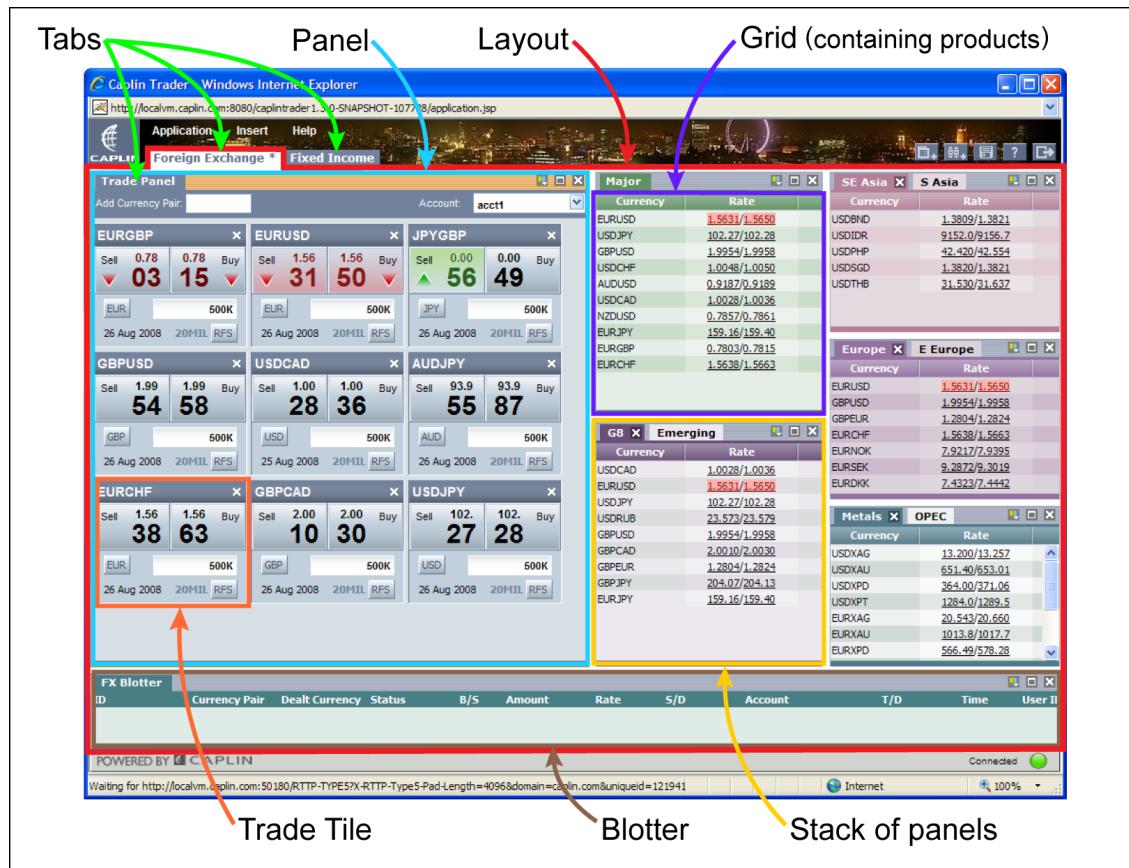
For example:

- ◆ There are many panels within the Web page.
- ◆ Users can switch between layered panels via “tabs”.
- ◆ Users can resize panels.
- ◆ Users can drag and drop panels to other parts of the application.
- ◆ Users can create new panels and populate them with tradable instruments.

The following sections show some of Caplin Trader Client's rich user features. These examples are based on the Reference Implementation (see [Caplin Trader out of the box](#)^[28]), but you can extensively customize both the appearance and behaviour of Caplin Trader Client to meet your own requirements (see [Customizing Caplin Trader](#))^[30].

3.1 How a page is organized

Here is a typical page from the Caplin Trader Reference Implementation.



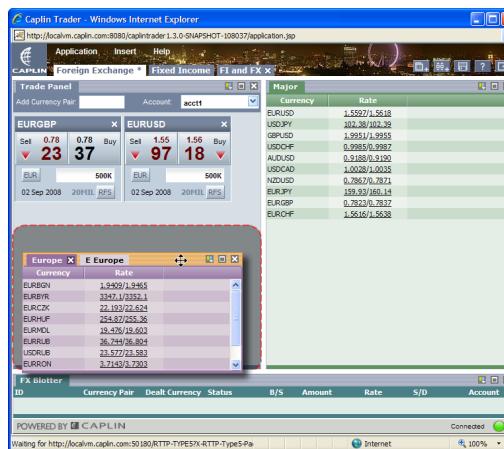
Caplin Trader Client - GUI Features

Panels, stacks, tabs, and layouts

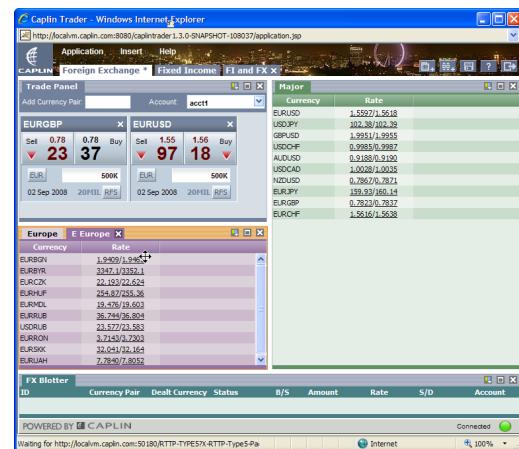
The page is divided into rectangular areas called **panels**. Panels can be stacked on top of each other. Each panel in a **stack** is identified by a **tab**; clicking on a tab brings its panel to the top of the stack so you can see the content displayed in the panel.

The arrangement of panels on the page is called a **layout** and there can be multiple layouts on the page. You switch between layouts using the row of tabs at the top of the page (the "Foreign Exchange" and "New Layout" tabs in the example above).

A stack of panels can be manipulated like a window; you can resize it by dragging the splitters that separate it from neighboring panels, and you can move it by dragging it with the mouse, as shown in the following pictures.



Moving a stack of panels by dragging



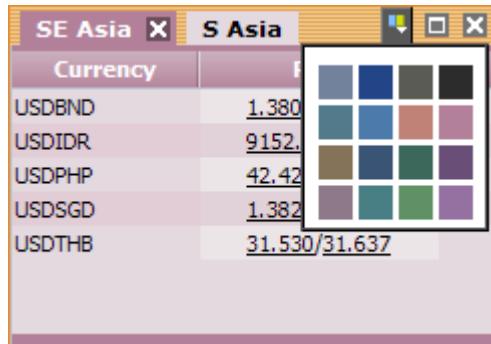
The stack of panels in their new position

By dragging on a tab you can also move its panel into one of the other stacks, or into a new position all by itself on the screen.

3.2 Panel management buttons

A standard panel or stack of panels has three buttons in the top right hand corner:   and .

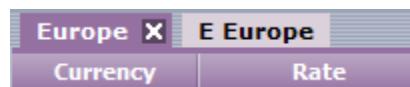
- ◆ The  button brings up a color chooser:



The color chooser

You can change the color scheme of the panel or panels in the stack by selecting a color from the displayed palette.

- ◆ The  button maximizes the panel or stack of panels to fill the whole working area of the Caplin Trader page.
- ◆ The  button closes the whole stack of panels (or the single panel if there is only one tab).
- ◆ In a stack of panels there is an  button on the right hand side of the tab for the panel that is currently selected. Clicking this button will close just that panel, leaving the rest of the panels in place.



Button to close a single panel in a stack

3.3 Grids

Caplin Trader Client can display information in panels using a grid format. For example the Caplin Trader Reference Implementation uses the grid format to display **product grids** of for Fixed Income instruments such as corporate bonds. The yield and price information is updated in real time on the grid.

Description	Coupon	Maturity Date	Bid Yield	Price	Ask Yield
ASIA ALUMINUM	8.000	23-Dec-2011	9.238	87.63/89.88	9.013
SOUTHERN COPPER	6.375	27-Jul-2015	16.375	0.00/0.00	16.375
SOUTHERN COPPER	7.500	27-Jul-2035	17.500	0.00/0.00	17.500
ALROSA	8.125	06-May-2008	8.103	100.23/100.58	8.068
MMK	8.000	21-Oct-2008	7.973	100.27/100.77	7.923
SEVERSTAL	9.250	19-Apr-2014	8.950	103.00/103.75	8.875
NORILSK NICKEL	7.125	30-Sep-2009	7.000	101.25/102.25	6.900
ALROSA FIN	8.875	17-Nov-2014	7.800	110.75/111.50	7.725
VEDANTA RESOURCE	6.625	22-Feb-2010	6.800	98.25/99.75	6.650
EVRAZ GROUP	8.250	10-Nov-2015	8.475	97.75/98.50	8.400
KAZAKH GOLD	9.375	06-Nov-2013	9.950	94.25/95.75	9.800

A product grid displaying bond prices in real time

You can insert new product grids using the Insert --> Product Grid... menu item, or by clicking on the Add Product Grid button: . This creates an empty product grid to which you can add products to trade (see [Product Search](#)).

You can add and remove columns in a grid and re-order them.

Description	Coupon	Maturity Date	Price	Ask Yield
ASIA ALUMINUM	8.000	011	92.13/94.38	8.563
SOUTHERN COPPER	6.375	015	0.00/0.00	16.375
SOUTHERN COPPER	7.500	035	0.00/0.00	17.500
ALROSA	8.125	008	99.70/100.05	8.120
MMK	8.000	008	101.27/101.77	7.823
SEVERSTAL	9.250	014	104.13/104.88	8.763
NORILSK NICKEL	7.125	009	95.75/96.75	7.450
ALROSA FIN	8.875	17-Nov-2014	111.50/112.25	7.650
VEDANTA RESOURCE	6.625	22-Feb-2010	98.25/99.75	6.650
EVRAZ GROUP	8.250	10-Nov-2015	97.38/98.13	8.438
KAZAKH GOLD	9.375	06-Nov-2013	83.00/84.50	10.925

Grid drop-down menu for adding and removing columns

The product grid is an example of a Grid display component.

3.4 The Trade Panel

You can quickly trade on selected instruments via the Trade Panel. For example, in the Caplin Trader Reference Implementation the Trade Panel contains a set of Trade Tiles, where each tile allows you to trade a particular FX currency pair.



Trade Panel containing two Trade Tiles

The Trade Tile is typically used to display executable streaming prices and allow one-click trading based on these prices. Buy and sell prices are displayed in real time and you trade by single-clicking on the square containing the pip for the buy or sell price. The tile can also be configured so that trades must be initiated with two mouse clicks, to guard against accidental trading.

You can easily create a new Trade Tile for a currency pair by dragging the pair name from a Product Grid and dropping it onto the Trade Panel. Alternatively you can type the pair name into the "Add Currency Pair" box in the top left corner of the panel and press the return key. When you enter the first two characters of the currency pair, Caplin Trader produces a drop down box of matching currency pairs; to quickly create the Trade Tile just click on the required entry, as shown in the following picture.



Selecting a Trade Tile using autocomplete

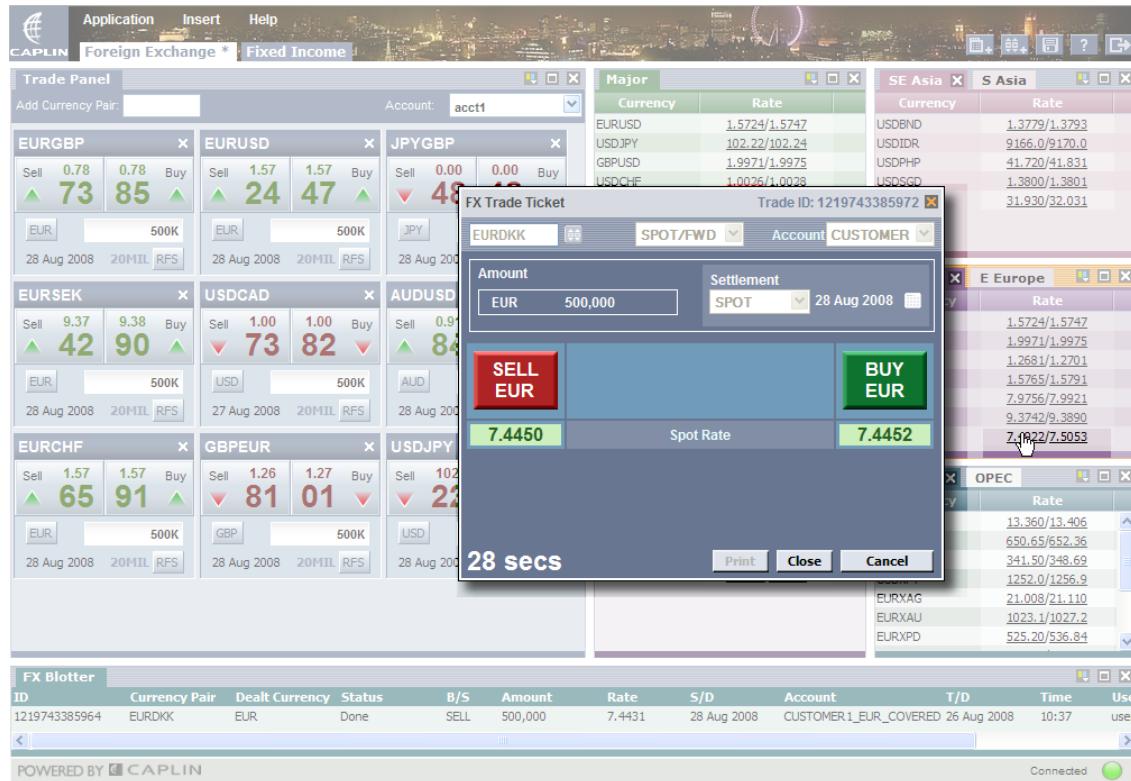
Trade Tiles support multiple tiered streaming prices. Based on the trade amount entered, the appropriate price is displayed. The limit of the current price tier is displayed in the bottom right of the tile.



**Trade tiles with different price tiers
(20 MIL and 1 MIL)**

3.5 Trade Tickets

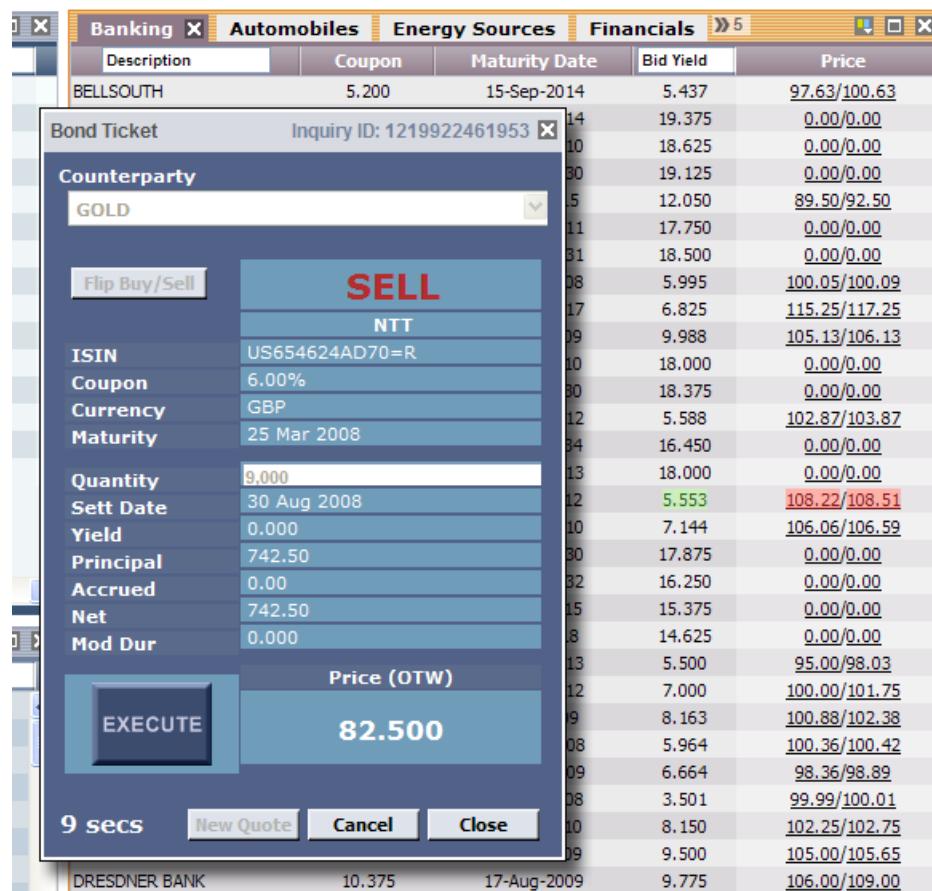
Clicking on the underlined prices for an instrument in a particular Product Grid opens a Trade Ticket that allows you to execute a trade on that instrument. The picture below shows the Trade Ticket for an RFS trade on the FX currency pair EURDKK.



A Trade Ticket with an RFS trade in progress

The Trade Ticket supports more complex trading models than the simple Executable Streaming Price (ESP) trading offered by the Trade Tiles in the Trade Panel. These trading models can implement functionality such as forward trading, trading amounts that are above the maximum tier limit for ESP trades, and trading currency pairs that cannot be traded through ESP.

The Trade Ticket shown in the previous picture supports a Request for Stream (RFS) trading model. The next picture shows a bond trade using an RFQ model.



A Trade Ticket with an RFQ trade in progress

The following picture shows a trade ticket confirming an FX swap transaction.



A Trade Ticket confirming an FX swap

A Trade Ticket is tied to a trading model that defines the flow of messages used in the process of executing a trade – see [Customizing Trade Tickets and trade models](#).

3.6 The Trade Blotter

Caplin Trader Client provides a Trade Blotter that records and displays information on the progress and completion of trades.

ID	Currency Pair	Dealt Currency	Status	B/S	Amount	Rate	S/D	Account	T/D	Time	User ID
1219746217140	EURGBP	EUR	Done	BUY	500,000	0.7874	28 Aug 2008	acct1	26 Aug 2008	11:26	user1@caplin.com
1219746217141	EURUSD	EUR	Done	SELL	500,000	1.5614	28 Aug 2008	acct1	26 Aug 2008	11:25	user1@caplin.com
1219746217144	EUROKK	EUR	Done	SELL	500,000	7.4443	28 Aug 2008	CUSTOMER1_EUR_COVERED	26 Aug 2008	11:25	user1@caplin.com
1219746217143	EURDKK	EUR	Done	SELL	500,000	7.4435	28 Aug 2008	CUSTOMER1_EUR_COVERED	26 Aug 2008	11:25	user1@caplin.com

Trade Blotter displaying completed FX trades

3.7 Product Search

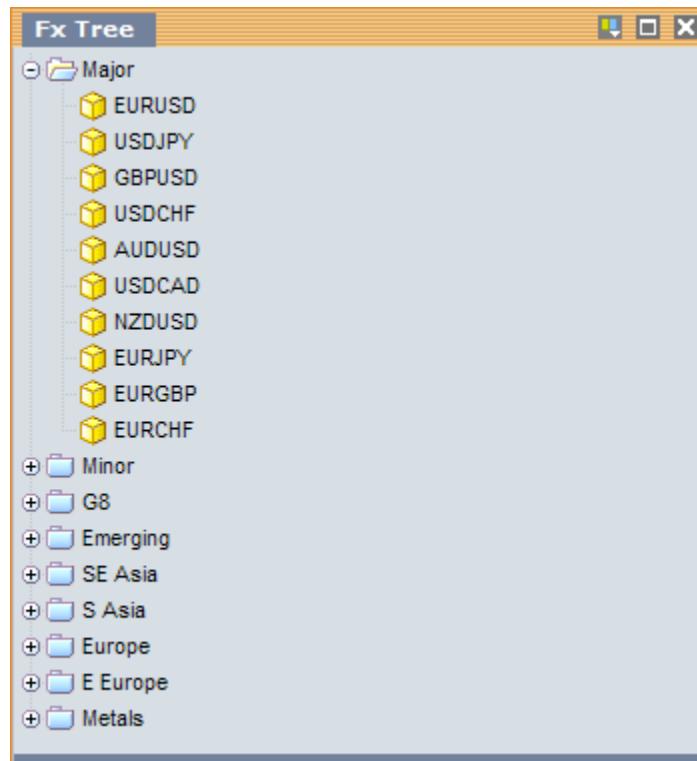
You can search for products to add to existing or new Product Grids by using the product search entry in the Tools menu (Add currency pair... in the Caplin Trader Reference Implementation for FX trading), or by clicking on the Product Search button . For example, the product search dialog box allows you to choose an FX currency pair:



Product Search dialog box for FX currency pairs

3.8 The Tree View

Caplin Trader Client can display information in panels using a tree view. The following example shows a panel containing a hierarchy of FX currency pairs, arranged in folders and displayed as a tree view.



A tree view displaying a hierarchy of FX currency pairs

You can click on a node of the tree to display or hide the items in the branch below that node. Individual instruments or a set of instruments in a folder can be dragged and dropped into grids and trade panels.

3.9 Fusion Chart

Caplin Trader Client can display Fusion charts, providing users with graphical displays of summary information such as price trends and yield curves.

The Reference Implementation contains some example FX trend charts, such as the following EURUSD price history:

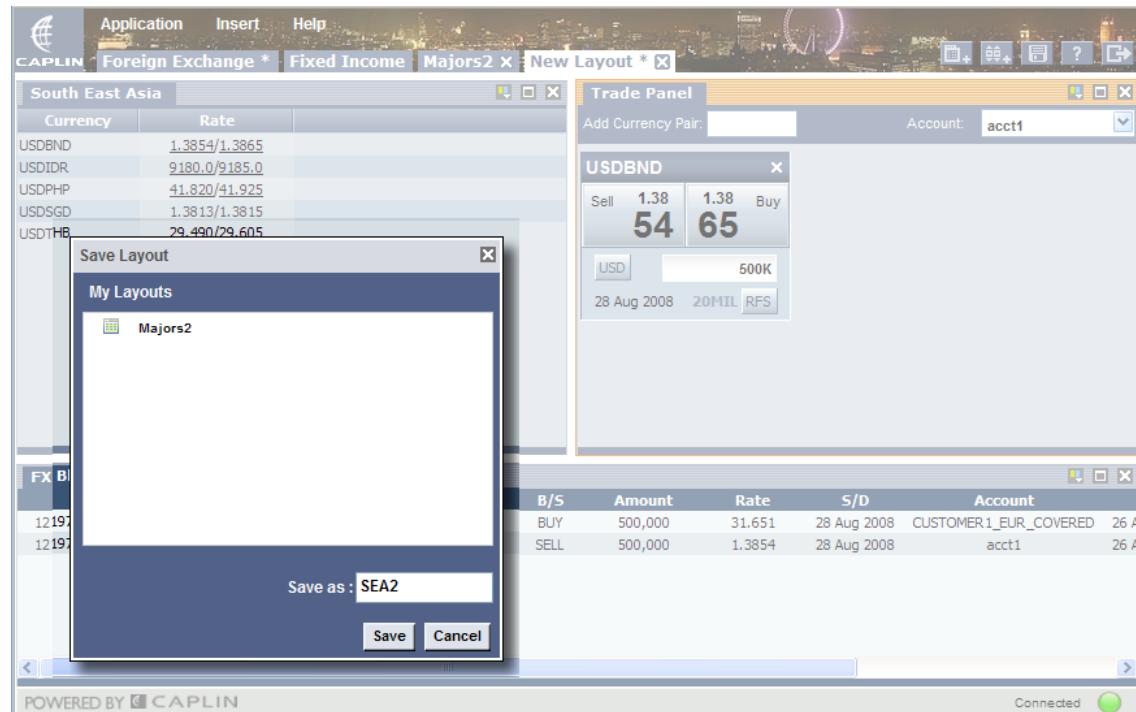


Fusion chart showing EURUSD price history

3.10 Creating, saving, and loading layouts

Through the Layout menu you can:

- ◆ Create new layouts (and subsequently populate them with Product Grids, Trade Panels, and Blotters using the Insert menu).
- ◆ Save your new layouts and any modifications to existing layouts.
- ◆ Load layouts that you saved in previous trading sessions.



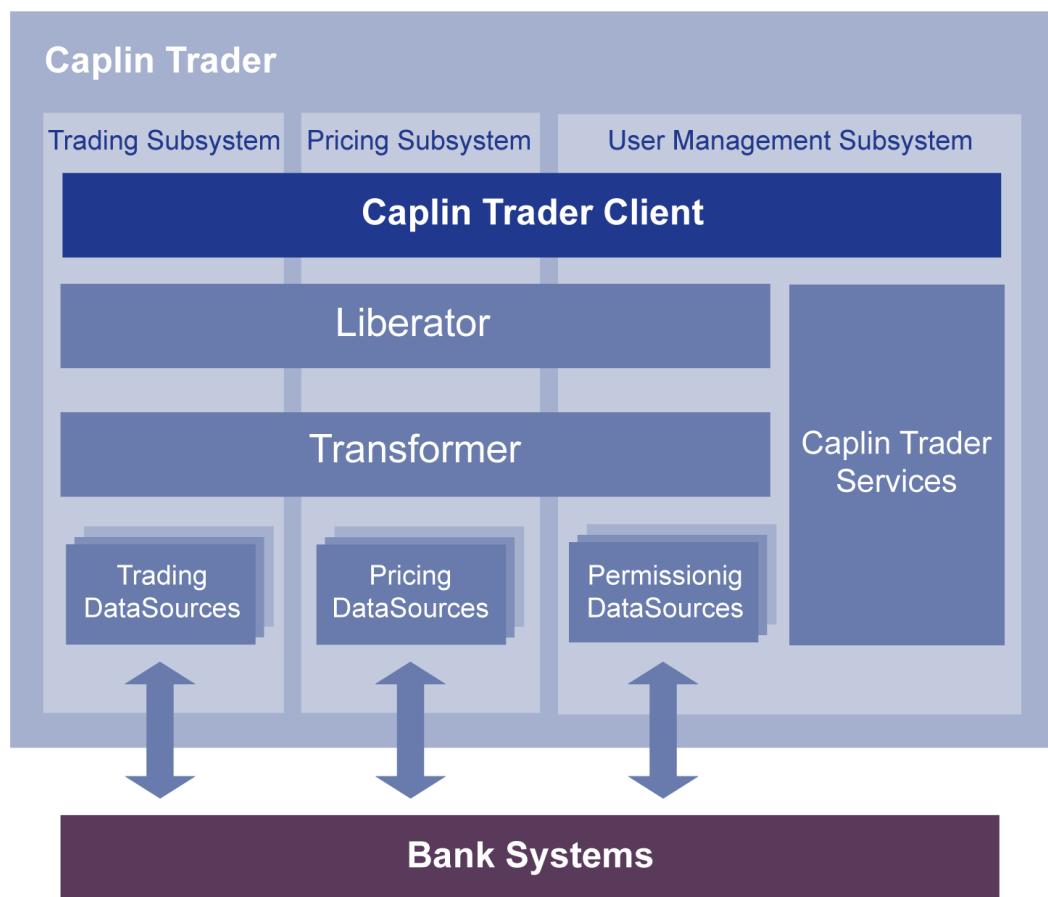
Saving a layout

4 Behind the scenes

The following sections contains more technical information about the architecture of Caplin Trader and Caplin Trader Client, and the software environment in which they run.

4.1 The Caplin Trader architecture

The following diagram shows the architecture of Caplin Trader.



Caplin Trader consists of Caplin Trader Client, Caplin Trader Services, and various components of the Caplin Platform. It contains three functional subsystems that handle trading, pricing, and user management respectively.

Caplin Trader Client is the rich GUI-based client application through which end-users trade. It runs in a Web browser, and is loaded from a third-party application server. At run time it makes use of various services (**Caplin Trader Services**) that are hosted on an application server. Some of these services use a database as a source of data and/or to persist data. For more detail about how Caplin Trader Client and

Caplin Trader Services work see [Caplin Trader Client and Services structure](#)^[24].

Caplin Trader Client uses StreamLink for Browsers to manage the connection with **Liberator**, a real time streaming server. Through this connection to Liberator, Caplin Trader Client subscribes to real time data provided by various **Pricing DataSources**, and exchanges trade messages with **Trading DataSources**.

Each instance of Caplin Liberator server can support many thousands of concurrent users, and automatic load balancing across multiple servers allows unlimited numbers of users to connect with high resilience.

Transformer is an event-driven real time business rules engine. It uses customizable business logic modules to transform price data obtained from the Pricing DataSource; for example it can be used to generate price spreads and cross rates, and to filter the information displayed in grids (see [Caplin Trader out of the box](#)^[25]). It publishes the transformed data back to the Liberator in real time for onward transmission to subscribing Caplin Trader Clients.

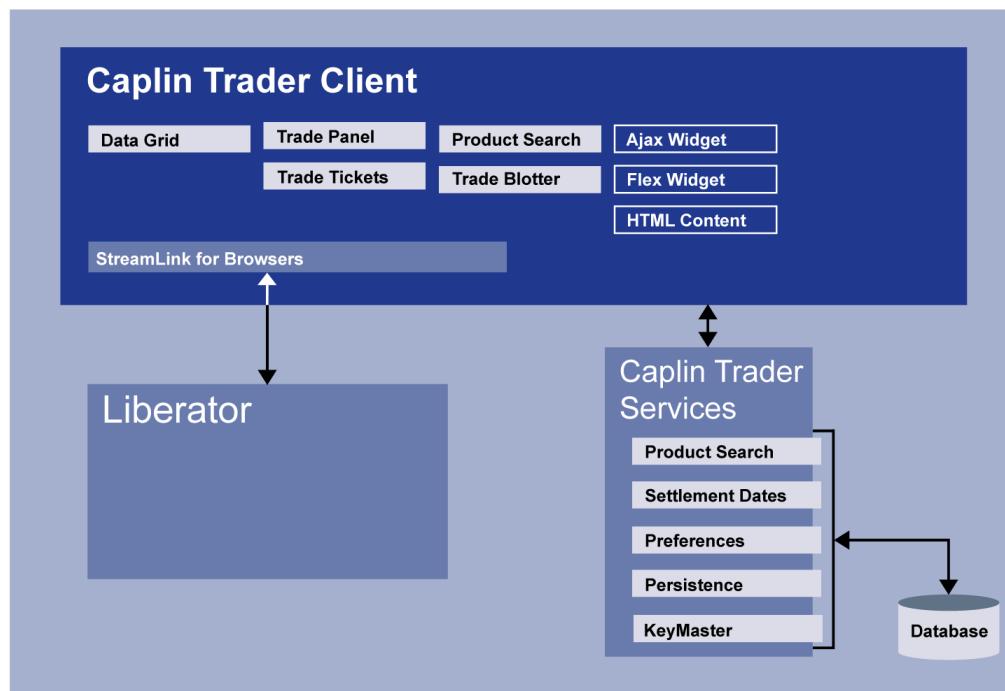
The DataSources integrate Caplin Trader with your existing market data, trading systems, and permissioning systems (“bank systems” in the diagram). Standard DataSource adapters and DataSource toolkits make it easy to do this. A DataSource can be a standalone component, or when required and appropriate for its architecture, it can be integrated at code level with the external system to which it interfaces.

Permissioning DataSources allow Caplin Trader to fully integrate with your own permissioning system through a well defined, flexible, permissioning model and permissioning API.

For more technical information see the document **Caplin Trader Architecture**.

4.2 Caplin Trader Client and Services structure

The following diagram shows the internal structure of Caplin Trader Client and Caplin Trader Services.



Caplin Trader Client and Caplin Trader Services

Caplin Trader Client components, consist of:

- ◆ A flexible and highly configurable [client-side portal framework](#)^[25] that uses Ajax technology.
- ◆ A set of display components (Grid, Trade Panel, Trade Tickets, and so on) for data display and trading.
- ◆ HTML and Adobe® Flash® based Content.

Caplin Trader Client executes in a Web browser and is implemented as HTML, Images, and JavaScript code. It is installed on an application server or on a standard Web server.

Caplin Trader Client also uses the **StreamLink for Browsers** library. This is a component of the standard Caplin Platform, and is the real-time communications layer that manages the exchange of market data and trading messages between Caplin Trader Client and Liberator.

Caplin Trader Services execute on any standard Java application server and provide various run time services to Caplin Trader Client (see the section [Caplin Trader Services](#)^[26]).

The database. Some of the Caplin Trader Services, such as the Preferences and Persistence Web Services, need access to a database. This may be all Caplin Trader needs the database for, but you may also want your own components or external systems to use the database for accessing preference information, for storing permission information, or for accessing historic data. A database is often used in conjunction with the Product Search service to provide information on the available financial products in the system.

Client-side portal framework

Caplin Trader uses a client-side portal framework implemented in Ajax. This framework gives Caplin Trader Client the look and feel of a windows style desktop application. Its features include:

- ◆ Many panels within the Web page.
- ◆ Layered panels switchable via “tabs”.
- ◆ Panel resize.
- ◆ Drag and drop.

The framework manages a set of display components. These components include various ways to present indicative market data and trade information, such as Grids, Trade Tickets, Trade Tiles, and Trade Blotters – see [The Caplin Trader display components](#)^[25].

The framework is highly configurable so you can customize the look and feel of Caplin Trader Client as much or as little as you want – see [Customizing Caplin Trader](#)^[30].

The Caplin Trader display components

The GUI display components provided for use in Caplin Trader Client include:

- ◆ A Grid
- ◆ A Trade Blotter
- ◆ Trade Tickets
- ◆ Trade Tiles
- ◆ Product Search
- ◆ A Tree View
- ◆ Fusion Chart

The appearance and behaviour of these display components is described in the section [The user experience](#)⁹. For more technical information about them, see the **Caplin Trader Architecture** document.

Caplin Trader Services

Caplin Trader uses various services that are hosted on the application server:



Caplin Trader Services

- ◆ **Product Search service**

The Product Search service provides a look up of the products available to the user. This service must be integrated with your systems.

- ◆ **Settlement Date service**

The Settlement Date service allows Caplin Trader Client to obtain valid settlement dates, used for validation and display on calendars. Caplin provides a simple version of this service as standard, but you can also extend it and integrate it with your existing calendar systems.

- ◆ **Preferences Service**

The Preferences Service allows user preferences to be saved. This is a standard service integrated into Caplin Trader, but it can be extended to include new preferences (such as date formats, default trade sizes, and default currency), or to interface to an existing user information system.

- ◆ **Persistence Service**

The Persistence Service allows the state of the Caplin Trader Client instance to be saved, so that users' layouts can be saved and restored.

- ◆ **KeyMaster**

KeyMaster provides integration with single sign on systems, interacting indirectly with Liberator's Auth Module and the Permissions DataSource.

You can also implement custom Caplin Trader Web services, for example, a Historic Data service that could be used to retrieve historic blotter information or other non real-time data.

4.3 Software environment

Caplin Trader Client

Caplin Trader Client runs in the following Web browsers:

- ◆ Mozilla Firefox V1.5 and above
- ◆ Microsoft Internet Explorer 6*
- ◆ Microsoft Internet Explorer 7

*To ensure the best performance when running Caplin Trader Client in Internet Explorer 6, it is highly recommended that the browser has latest script engine patch from Microsoft.

Application Server

The Application Server hosts Caplin Trader Web Services (see the diagram in [Caplin Trader Client and Services structure](#)^[24]). These services are JavaTM Servlets, so they can be deployed on any J2EETM compliant application server, including the Apache/Tomcat, JBoss, BEA WebLogic, and IBM WebSphere application servers.

Database

The database supporting Caplin Trader Web Services can be any SQL compliant database that can be accessed through Java Database Connectivity (JDBCTM).

Caplin Platform server components

The server components of the Caplin Platform (Liberator, Transformer, and the various DataSources) run under the Linux® and Sun® SolarisTM operating systems. Java based DataSources will also run on Microsoft Windows.

5 Caplin Trader out of the box

Caplin Trader is shipped with a Reference Implementation and all the required Caplin Platform components to provide a fully-functional trading portal straight out of the box. This means that, you can install the software on a single machine to produce a working example system. This can easily be modified, customized and extended to create bespoke offerings.

You can use the out-of-the-box installation as the starting point for customizing Caplin Trader to meet your own requirements, and for integrating Caplin Trader with your existing trading infrastructure.

The implementation of Caplin Trader Client provided in the installation kit is focused on FX trading, as shown in the screen image in the section [About Caplin Trader](#)³. The other Caplin Trader components provided in the installation kit are configured to support this FX trading application, as follows:

- ◆ Pricing DataSource

Pricing data is provided by a demonstration Pricing DataSource that produces simulated data. Alternatively if you have access to a Reuters price feed you can use DataSource for Reuters as a source of real indicative price data. The other Trading Platform components can make use of this data when they are running in demonstration mode.

- ◆ Trading DataSource

The Trading DataSource is responsible for the interaction between the client and a trading system. A standard Trading DataSource is provided that acts as a demonstration. This means it will automatically act as a dummy trading system, providing executable prices and accepting trades for demonstration purposes.

- ◆ Liberator

The Liberator server is configured to operate with the demonstration versions of the other components: Caplin Trader Client, the Pricing DataSource, and the Trading DataSource.

- ◆ Transformer

Transformer is configured with the following modules. They provide a reference implementation that can be extended or customized to suit customer requirements. Most of the modules are written in the Lua scripting language so that they can be customized easily.

- FX cross rates module

Derives indicative FX cross rates from benchmark rates.

- Tiering module

Allows different price spreads to be created for individual users, based on core pricing.

- Normalization module

A rules-based module that normalizes data from multiple data sources: instrument names can be transformed to a single common standard, field names can be normalized to the same tokens, and price formats can be standardized, irrespective of the origins of the price data.

- Container module

This module allows product groups to be configured as container data items. When Caplin Trader Client subscribes through Liberator to a product group container, it is automatically subscribed to all the instruments within the container. Liberator manages the container on behalf of all the subscribed clients, so that the clients receive changes to the container contents in real time.

- Container filtering module

Users of Caplin Trader Client can filter lists of instruments displayed in a grid format. The master list is managed as a container. The Transformer module creates a new container from the master container by applying the filtering criteria supplied from Caplin Trader Client.

For example, in the Reference Implementation Transformer applies a yield filter to a master container containing fixed income instruments, creating a new container that lists just those instruments with a yield within a given range.

6 Creating your own Caplin Trader

Once you have installed Caplin Trader, you will want to customize the software to meet your own requirements. You will also need to integrate the Caplin Trader with your existing or new trading infrastructure. For example, you may have an existing trading system with which Caplin Trader must communicate to get price quotes and initiate trades.

6.1 Customizing Caplin Trader

Caplin Trader can be extensively customized to provide exactly your required business functionality, appearance, and behaviour.

What aspects of Caplin Trader can I customize?

You can customize the following aspects of Caplin Trader:

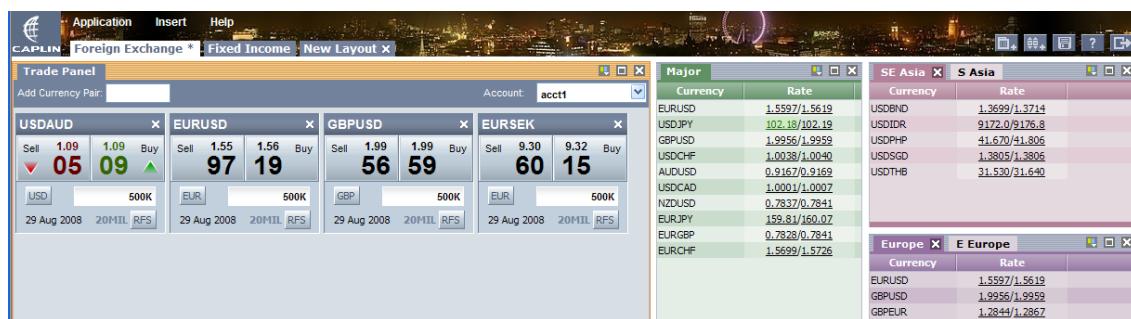
- ◆ The look and feel of Caplin Trader Client.
- ◆ Caplin Trader's standard display components (Grids for example).
- ◆ Product Search.
- ◆ Trade Tickets and trade models.
- ◆ Add external Web content.
- ◆ Add third party and custom display components.

For more detailed information on customizing Caplin Trader and the Caplin Platform see the [Caplin Trader Architecture](#).

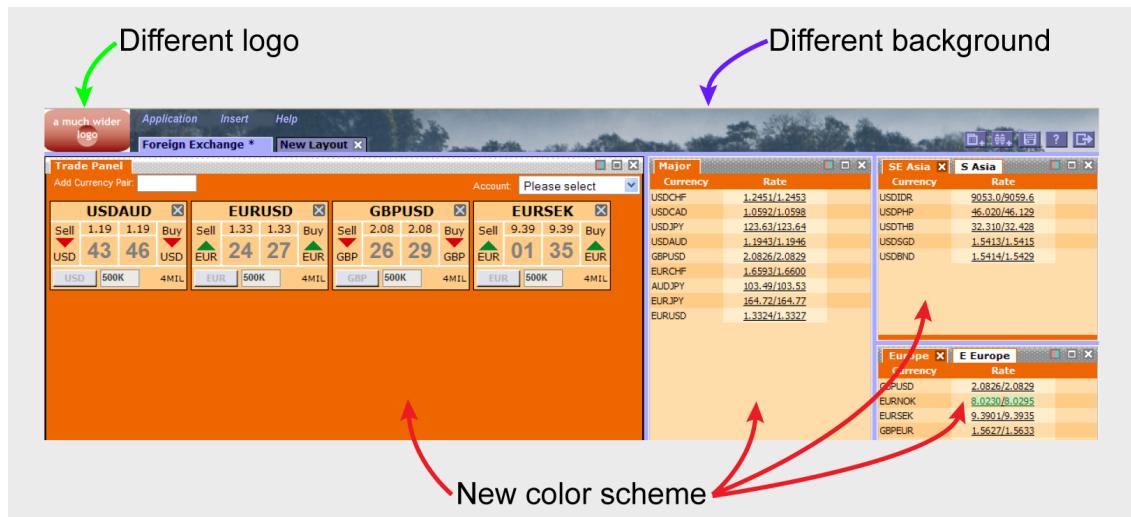
Changing the look and feel of Caplin Trader Client

The look and feel of Caplin Trader Client is completely customizable. You can change the theme, which defines how the panels, windows, menus, and buttons look, and you can change the layout of the items displayed on the screen.

When changing the theme you can easily apply your own branding. For example the following pictures show the effect of replacing the Caplin logo with a different one, changing the background image in the top bar, and changing the overall color scheme. These changes are made simply by altering some XML and CSS definitions.



Caplin Trader Client theme "out-of-the-box"



Caplin Trader Client with customized theme

The screen layout of panels and tabs can be set up in a number of ways. You can pre-define the structure and layouts and lock them down so that the end user has a fixed interface, or the predefined layouts could just be starting points to an interface that the end users customize themselves. For example, the SE Asia and other FX Product Grids shown in the previous pictures are all pre-defined Product Grids; users cannot add FX products to or delete products from these grids. In the Caplin Trader Reference Implementation, users can also create and populate their own Product Grids (see [Grids](#)¹³ under [The User Experience](#)⁹).

It is also possible to have a fixed outer layout, but still allow end users to customize parts of the layout; for example a fixed Trade Blotter along the bottom or a fixed sidebar on the left.

You can also customize aspects of the GUI interface's behavior; for example, you can define the actions for menus and buttons.

Customizing Caplin Trader's standard display components

You can customize many of the standard display components that are used in Caplin Trader Client, including the Grid, Trade Tile, and Trade Blotter.

For example, the Grid can be customized to set the field used for each column and specify a subscription to a predefined container that will fill the Grid. You can also specify a list of items to fill the Grid and customize the behavior of each column, such as allowing the user to click to open a trade ticket.

Customizing Product Search

Users need a way of accessing the products they want; in some systems there can be a complex set of products with various attributes. Accordingly, you can extend the basic functionality of the Product Search service to access your own product data.

Users access the Product Search functionality using the Product Search dialog box. This dialog usually needs to be customized to provide the relevant information needed for your products, since different products may require different search criteria and different presentation of search results.

Customizing Trade Tickets and trade models

Trade Tickets are a key part of the application. They indirectly interact with the Trading DataSource and the trade models that are set up within the Trading DataSource. The trade model therefore controls the behavior of the Trade Ticket.

Caplin Trader is designed to support any kind of trade model and the behavior of trade models can be modified. New trade models will often require the Trade Tickets to be customized so that the behaviour and user interface of the Trade Ticket display component matches the trade model being used.

The definition of the trade model for the Trading DataSource can be used to configure the behaviour of the Trade Tickets in the Caplin Trader Client. Additionally, you can customize the layout of existing Trade Tickets, or replace them completely with your own fully customized implementation.

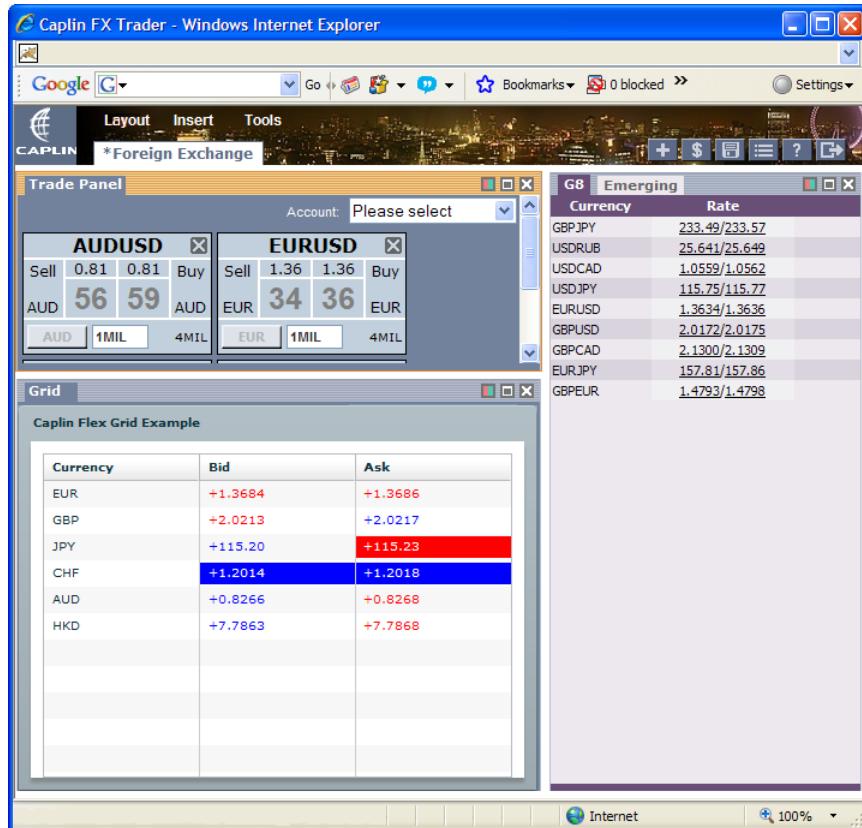
Adding external Web content

You can easily add external web content to your implementation of Caplin Trader Client: full web sites, images, partial HTML fragments, and Adobe Flash and Flex content such as Fusion charts. These can be set up as part of the application or they can be added dynamically from menus or other controls.

External Web content can be added in two main ways; the application can use HTML IFrames to load full web pages or it can just load HTML fragments that are incorporated directly into the document.

Third party and custom display components

You can create custom display components, and integrate them directly into Caplin Trader Client. For example, the following picture shows a Grid that has been implemented as a Flash object using Adobe Flex™.



Caplin Trader with a Grid written in Flex

Components from third party Ajax toolkits can also be integrated, in a similar way to your own custom display components.

An example of customization for FI trading

The following picture shows a page of Caplin Trader Client for a Caplin Trader implementation that has been extensively customized to implement FI trading. The look and feel of the client has been completely changed, compared to the FX trading application in the Reference Implementation.

The screenshot displays a highly customized version of the Caplin Trader Client for Fixed Income (FI) trading. The interface is titled "Caplin Bond Trader - Mozilla Firefox" and features a purple header bar with the "CAPLIN trader" logo. The main content area is organized into several panels:

- Key Rates:** A grid showing current rates for various bonds, including Dow Jones, Nasdaq, S&P 500, 10-Yr Bond, NYSE Volume, Nasdaq Volume, USD/Yen, and USD/Euro.
- Stock Quote:** A panel showing a stock quote for IBM (NYSE) with fields for Now, Price Change, and Percent Change.
- AAA Euro Bonds Med Maturity:** A detailed grid of bond data for AAA Euro Bonds with maturities between 15-Jul-09 and 28-Jan-10. Columns include Name, Coupon, Max. Date, Bid, Ask, Net Chg, Yield, Bid Yld, Ask Yld, B/marke, Swap Spread, Asset Spread, and Spread.
- Research:** A list of research reports from various sources (Barclays, HSBC, etc.) dated from April 2008 to May 2008, covering topics like Economics, FI Strategy, and Forecasts Summary.
- Treasury Yield Curve:** A chart showing the Treasury Yield Curve for US bonds, plotting Yield (%) against Maturity (Years).
- Bond Data:** A grid showing bond details for ACE 5.699 15/00/2017 100.853/100.866, including Coupon, Maturity, Dated Date, First Coupon, Amt Issued, and Outstanding.
- World News:** A sidebar listing international news items such as "Oil Prices Climb Above \$66 a Barrel" and "United Retail May same-store sales rise 4 pct".

Caplin Trader customized for FI (bond) trading

This page illustrates how extensively you can customize Caplin Trader to meet your requirements.

The customizations include:

- ◆ A completely different color scheme, which is fixed so end users cannot modify it.
- ◆ Custom menu items (Trade History, Search, Portfolio Admin), with button styling and behavior.
- ◆ Customized Product Grids (for example, “AAA Euro Bonds Med Maturity”).
- ◆ A locked down panel layout that end users cannot change (there are no panel management buttons, and no tabs).
- ◆ Several third party content panels (“Research”, “Bond Market News”, “World News”).
- ◆ A chart (“Treasury Yield Curve”) implemented as a Flex component.

The other components of Caplin Trader (Caplin Trader Services, Pricing and Trading DataSources, Liberator, Transformer) would also need to be configured and customized to support bond trading (see [How do I customize Caplin Trader?](#) [35]).

How do I customize Caplin Trader?

Caplin Trader can be customized using two basic mechanisms: configuration files and JavaScript coding.

Much customization can be done through configuration. For example:

- ◆ You can change many aspects of the look and feel of the GUI interface by modifying XML-based configuration data and associated CSS class definitions.
- ◆ You can define XML to customize the appearance and functionality of display components such as Grids, Trade Panels, and Tree Views.

JavaScript coding is used for:

- ◆ Advanced customization of the GUI theme and layout.
- ◆ Advanced customization of Caplin Trader display components, including the Grid, Trade Tile, Trade Blotter, and Trade Tickets.
- ◆ Implementing and integrating custom display components.
- ◆ Integrating third party display components.

Third party and custom display components can be added through the global application configuration or more dynamically through user interaction with menus or other controls. The most effective integration involves hooking the component into the Caplin Trader event model using the client-side portal framework's API. This allows events such as 'resize' to be handled by the component and takes full advantage of the runtime features offered by Caplin Trader.

For more information on the customization techniques applying to particular aspects of Caplin Trader, see the [Caplin Trader Architecture](#).

6.2 Integrating Caplin Trader with your trading infrastructure

There are various integration points within Caplin Trader. Some of these are mandatory; without integration Caplin Trader will simply run using demonstration versions of some of the Platform components. Other integration points are optional and allow you to extend or customize functionality.

Components that may require integration include:

- ◆ Pricing DataSource
- ◆ Trading DataSource
- ◆ Product Search Service
- ◆ Settlement Date Service
- ◆ Preferences Service

For more information about how Caplin Trader can be integrated with your company's own and third-party systems, see the [Caplin Trader Architecture](#).

6.3 The Caplin Trader Development Suite

The Caplin Trader Development Suite provides you with access to all the software, tools, and support you need to build your own online trading solution in-house, based on Caplin Trader. Components & SDKs

It includes:

- ◆ All the Caplin Platform components and SDKs necessary to build a trading system.
- ◆ A fully licensed Ext JS library is included, to simplify development of Caplin Trader Client.
- ◆ A development environment, including development tools, build tools, test tools, and documentation.
- ◆ Upgrades and upgrade assistance.
- ◆ Product and development support, by email and telephone.
- ◆ Access to Caplin's Professional Services.

For more information see the document **Caplin Trader Development Suite**.

7 Glossary of terms and acronyms

This section contains a glossary of terms, abbreviations, and acronyms relating to Caplin Trader.

Term	Definition
Adobe Flash	Software from Adobe Systems Inc. for authoring and rendering web content, particularly vector graphics based animation and graphics.
Adobe Flex	A software development kit and integrated development environment from Adobe Systems Inc. for creating rich Internet applications based on the Adobe Flash platform. Flex uses ActionScript code and XML-based user interface descriptions (MXML) and compiles them into binary Flash files (SWF files).
Ajax	Asynchronous JavaScript and XML A combination of Web technologies used to implement interactive Web clients.
Blotter	See Trade Blotter .
Caplin Platform	The Caplin Platform is a suite of software products for on-line financial trading and Web delivery of real-time market data.
Caplin Trader	Caplin Trader is a complete platform and toolkit for building multi-product trading portals. It is built on the Caplin Platform . See About Caplin Trader ^[3] and The Caplin Trader architecture ^[23] .
CTC	Caplin Trader Client
Caplin Trader Client	Caplin Trader Client is a platform neutral Web application that provides a rich trading workstation in a browser. It is based on an Ajax framework into which you can place any Web content created in HTML, Ajax, Adobe Flex , or any other similar technology. It interfaces to the Caplin Platform and Caplin Trader Services . See About Caplin Trader ^[3] , The user experience ^[9] , The Caplin Trader architecture ^[23] , and Caplin Trader Client and Services structure ^[24] .
Caplin Trader Services	Caplin Trader Services provide the supporting server-side non-realtime services to Caplin Trader Client .
Client-side portal framework	Caplin Trader's client-side portal framework gives Caplin Trader Client the look and feel of a desktop GUI application. See Client-side portal framework ^[25] .
Color chooser	A button on a Caplin Trader Client panel and its associated dialog box that allows the end user to change the color theme of the panel or panels in a stack . See Panel management buttons ^[12] .
DataSource	DataSources are software adapters within the Caplin Platform that connect the Platform to external sources of real time data and external trading systems. See The Caplin Trader Architecture ^[23] .

Term	Definition
Display component	In the context of Caplin Trader a display component is a GUI component that can be embedded in a Caplin Trader Client page. The term also refers to the JavaScript code that generates the component and handles its user interaction. Caplin Trader Client has a number of pre-defined, customizable display components, such as Grids, Trade Tiles, and the Blotter. See The Caplin Trader display components ²⁵ .
ESP	<u>E</u> xecutable <u>S</u> treaming <u>P</u> rice trade model type.
Flash	See Adobe Flash .
Flex	See Adobe Flex .
Grid	A core component of Caplin Trader Client that presents data in a row and column format. See Grids ¹³ .
GUI	<u>G</u> raphical <u>U</u> ser <u>I</u> nterface
J2EE	<u>J</u> ava <u>2</u> Platform <u>E</u> nterprise <u>E</u> dition A set of Java tools for building and deploying enterprise applications.
JavaScript	A scripting language used in Web browsers
Liberator	Caplin Liberator is a bidirectional streaming push server designed to deliver market data and trade messages over any network that supports Web traffic. Caplin Trader communicates with a Liberator server. See The Caplin Trader Architecture ²³ .
Panel	A rectangular area on a Caplin Trader Web page in which data can be displayed. See How a page is organized ¹⁰
Product Grid	A Grid that displays product information. See Grids ¹³ .
Trade Tile	A Caplin Trader display component that allows the user to trade on a product with a single mouse click. See The Trade Panel ¹⁴ . Also see Trade Ticket .
RFQ	<u>R</u> equest <u>f</u> or <u>Q</u> uote trade model type.
RFS	<u>R</u> equest <u>f</u> or <u>S</u> tream trade model type.
Layout	The arrangement of panels on a Caplin Trader Web page. See How a page is organized ¹⁰
Splitter	A draggable horizontal or vertical bar that separates window components in Caplin Trader. Dragging a splitter allows the user to resize the window components that have the splitter as a boundary. See Panels, stacks, tabs, and layouts ¹⁰ in How a page is organized ¹⁰
SQL	<u>S</u> tructured <u>Q</u> uery <u>L</u> anguage
Stack	A rectangular area on a Caplin Trader Web page containing two or more panels layered on top of one another. A number of tabs are provided to allow the user to switch between the layers. See Panels, stacks, tabs, and layouts ¹⁰ in How a page is organized ¹⁰

Term	Definition
Tab	A graphical element, located vertically above the top of a window component, that allows the user to switch to another layered window component in a Stack . See Panels, stacks, tabs, and layouts ¹⁰ in How a page is organized ¹⁰ .
Trade Blotter	A Caplin Trader display component that records and displays information on the progress and completion of trades. See The Trade Blotter ¹⁹ .
Trade Model	A Trade Model defines a set of rules and procedures governing the exchange of financial instruments (buying, selling, swapping) between two parties. In an electronic trading system, such as Caplin Trader, the Trade Model controls the flow of a trade by defining all the possible states the trade can be in and the events that cause transitions from one state to another. Types of trade model include ESP , RFQ , and RFS . The details of how a particular type of trade model is implemented can vary from one trading system to another.
Trade Ticket	A Caplin Trader display component that allows the user to execute a trade on a product according to a particular trade model . See Trade Tickets ¹⁶ . Also see Trade Tile .
Transformer	Caplin Transformer is an event-driven real time business rules engine. Its role within the Caplin Platform and relationship to Caplin Trader are described in The Caplin Trader Architecture ²³ .
Client-side portal framework	Caplin Trader's client-side portal framework gives Caplin Trader Client the look and feel of a desktop GUI application. See Client-side portal framework ²⁵ .
XML	Extensible Markup Language

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