



TRADING  
TECHNOLOGIES®

# **CME Gateway System Administration Manual**

**Version 7.X**

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# Trading Technologies International, Inc.

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# About This Manual

## CME Gateway

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**Overview** This System Administration Manual (SAM) describes system architecture and configuration for the Trading Technologies CME Gateways. It is supplemental to the *TT Gateways Architecture SAM Version 7.X* and discusses information specific only to the CME Gateway.

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**Common Terms and Abbreviations** This manual uses the following terminology convention throughout:

- Exchange: The trading exchange (e.g., CME, CME Group)
- *Exchangenam*e: The name of the TT Gateway selected during its installation
- FIX: Financial Information Exchange

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**Chapter Overviews** This manual includes the following chapters:

Chapter	Description
Chapter 1	Describes the CME Gateway system architecture. This discussion focuses on the different components of the CME Gateway, how they function in relation to one another, and the various files used to support these operations.
Chapter 2	Provides procedures necessary to install or upgrade the CME Gateway. Also, describes updates and changes to the TT Gateway related to the current release.
Chapter 3	Describes how to configure membership information, configure the trading environment, and verify connectivity to the exchange after an install.
Chapter 4	Provides procedures for configuring the price feed connection, market data dissemination, and support for various products traded on the exchange. Data flows are included to facilitate the understanding of CME Gateway operations.
Chapter 5	Provides procedures for configuring the order server, order sessions, and order routers. Data flows are included to facilitate the understanding of CME Gateway operations. Supported order types are also provided.
Chapter 6	Provides the various disaster recovery and failover options available.
Chapter 7	Provides the various troubleshooting options available.
Appendix A	Describes the configuration files and parameters used on the CME Gateway.

**Table 1. Chapter Overviews**

## Additional Considerations

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**Related Documentation**

This manual is part of a comprehensive Trading Technologies set of documentation that includes but is not limited to the following topics and documents:

- TT Gateway Architecture System Administration Manual Version 7.X
- TT Trading Systems Network Administration Manual Version 2.0.1
- Guardian User Manual Version 7.5.2

For copies of any of these documents, visit the [TT Customer Portal](#).

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**Text Formatting Conventions**

This manual uses a set of terms, symbols, and typographic conventions to categorize specific information. Familiarity with these conventions will help you use this manual more effectively:

## Exchange Location and Interface

### What's New in 7.16?

In response to recently issued European Securities and Markets Authority (ESMA) guidelines, CME Gateways 7.16.1 and higher support the following features found in TT User Setup 7.4.6:

- **Price Control:** administrators can now set the price band in which orders can be entered for a given user to a pre-determined number of ticks above or below the current market price.
- **Order Throughput Control:** administrators can set limits on the number of messages per second that a user can send per TT gateway.
- **GTC/GTDate Control:** administrators can restrict the usage of GTC and GTDate orders.

For more information on these features, refer to the *TT User Setup User Manual*.

After an upgrade to CME Gateway 7.16, you must set the `Sendersubid` parameter to "Exchange" in `hostinfo.cfg` if you want to continue sending Trader IDs as Tag 50. If `Sendersubid` is not configured after an upgrade, the default gateway behavior for 7.16 and higher is to populate Tag 50 with the trader's TT Username defined in TT User Setup.

TT Gateways 7.16 introduce the [Integrated Message Acceleration](#) initiative. This marks the first appearance of a redesigned communications architecture across the entire TT trading platform.

TT's new integrated approach leads to large reductions in latency and variability when delivering prices, orders and fills from the exchange to trading applications. Traders should expect to see:

- Faster turnaround on re-quotes
- Mean latency reduced up to 80%
- Latency spikes reduced up to 95%
- Order latency reduced up to 40% in quiet market conditions
- Better odds against "getting legged" under heavy market conditions

In addition, the 7.16 Gateways include the following enhancements:

- **Windows Server 2008 Support:** TT Gateways 7.16 and higher contain an enhancement to fully support the Windows Server 2008 (R2 64-bit) operating system.
- **New TT Chron 7.7:** TT Chron 7.7 has been updated to fully support the Windows Server 2008 (R2 64-bit) operating system.
- **Order Session Identification:** TT Gateways now record the exchange credential used to route each order. Future versions of TT's client applications will contain an enhancement to display this value for each trade.
- **Number of Orders at Price:** TT Gateways obtain the number of orders at each price level and send it to the client trading applications.

**Note:** This feature requires X\_TRADER 7.11 or higher and is fully supported for the following TT Gateways 7.16: BrokerTec, BVMF, CBOT, CME, ICE, LME, MX, OSE and SGX.

- **Updated Audit Files:** Many exchanges require users to record additional



information related to trades. TT Gateways now include information relating to Request for Quote (RFQ) activity in the Audit Files.

**Note:** This enhancement only available for exchanges that support RFQs.

Please refer to the *CME Gateway Release Notes* for a full description of all fixes and enhancements in this version.

---

#### What's New in 7.15?

CME Group 7.15 includes an enhancement that significantly improves order and fill server performance by reducing the amount of redundant data transmitted when delivering shared order and fill data across the trading environment. Once a trading environment is fully upgraded, this enhancement seamlessly improves performance across the trading platform.

CME Group 7.15 also installs with a new version of the **fast.cfg** file that includes channels for both CME and CBOT products. In addition, default comment entries for new channels have been added to the **hostinfo.cfg** file.

Please refer to the *CME Gateway Release Notes* for a full description of all fixes and enhancements in this version.

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#### What's New in 7.14?

CME Gateway 7.14.4 or higher supports populating the mandatory iLink Tags required by the CME Group for all inbound FIX messages. In order to be compliant with the CME Group's iLink Tag requirements and ensure full support of the TT software changes made in response to these requirements, you must upgrade to version 7.14.4 or higher.

Please refer to the *CME Gateway Release Notes* for a full description of all fixes and enhancements in this version.

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#### Exchange Location

The Chicago Mercantile Exchange (CME) was established in 1898 and was originally known as the Chicago Butter and Egg Board. The exchange focused on trading agricultural futures contracts via open outcry. As new technologies emerged, CME introduced their Globex® platform to facilitate electronic trading.

Following a merger with the Chicago Board of Trade (CBOT) in 2007, CME grew to become the CME Group. The combined entity provides access to all major asset classes by offering futures and options based on interest rates, equity indices, foreign exchange, commodities, energies and alternative investment products such as weather and real estate.

As part of the exchange's further growth, CME began listing NYMEX and COMEX contracts on their Globex platform. In March 2008, CME Group announced that they are expanding this relationship with a definitive agreement for the acquisition of NYMEX.

**Note:** You can find the preceding exchange information on the CME Group's website at: [www.cmegroup.com](http://www.cmegroup.com).

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#### Matching Engine

CME Group (based in Chicago, Illinois) provides matching via the CME Globex® electronic matching engine.

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#### Matching Algorithms

CME Globex supports the following matching algorithms:

- First-In, First-Out (FIFO)
- Pro-Rata
- Split FIFO/Pro-Rata
- NYMEX FIFO with LMM



## 1 TT Gateway and the Exchange

- FIFO with LMM
- FIFO with TOP Order Percentage allocation and LMM
- Threshold Pro-Rata
- Threshold Pro-Rata with LMM
- Allocation
- Eurodollar Option

**CME Market States**

The CME Gateway displays the following contract states based on the market states it receives from the exchange.

<b>Market State</b>	<b>Description</b>
Pre-Open	<p><b>Order Entry:</b> During Pre-Open, orders can be added, modified, and canceled. During the No Cancel period (i.e., the end of the Pre-Open phase), orders can be added but not modified or canceled. No matching occurs during either Pre-Open state.</p> <p><b>Market Data:</b> Accepted orders are used to determine a theoretical opening price for the instruments/contracts that use this procedure. The exchange provides a Theoretical Opening Price (TOP) that the CME Gateway sends as the Indicative Open Price, and a Theoretical Opening Quantity (TOQ) that the gateway sends as the Indicative Open Quantity.</p> <p><b>State Changes:</b> Earliest phase of the opening market state. Pre-Open represents two different states at the CME: Pre-Open and No Cancel.</p>
Trading	<p><b>Order Entry:</b> Orders can be added, modified, or canceled. Matching occurs.</p> <p><b>Market Data:</b> All filled orders update Last Traded Price and Last Traded Quantity. In addition, only prices in the Open state affect the High/Low prices for the trading day. Resting Market and Limit orders are matched at the price calculated by the exchange when the market moves from Pre-Open to Open.</p> <p><b>State Changes:</b> Occurs after Pre-Open.</p>
Closed	<p><b>Order Entry:</b> No orders can be added, modified, or canceled. No matching occurs.</p> <p><b>Market Data:</b> No market data is provided until Pre-Open of the next trading session.</p> <p><b>State Changes:</b> Occurs at the end of the Trading session.</p>
Freeze	<p><b>Order Entry:</b> Orders can be canceled, but can not added or modified. No matching occurs.</p> <p><b>Market Data:</b> No market data is provided until continuous trading resumes.</p> <p><b>State Changes:</b> Occurs whenever continuous trading is interrupted. May occur for a contract prior to Pre-Open.</p>

**Table 2. CME Market States**

Market State	Description
Expired	<p><b>Order Entry:</b> Indicates an expired contract. No order actions are allowed and no matching occurs.</p> <p><b>Market Data:</b> No market data is provided for the expired contract.</p> <p><b>State Changes:</b> May occur as a transition from any other Market State, and is triggered by the expiry date and time on the contract definition sent by the exchange. Most often, Expired occurs immediately after Closed.</p>
Unknown (7.15 or higher)	<p><b>State Changes:</b> The exchange's market state cannot be determined by the CME Gateway. The contract may be in any of the above states except Expired. Unknown will occur if a gateway is restarted during an active trading session.</p>

---

**Table 2. CME Market States**

## Trader and Firm Identification

<b>Overview</b>	CME uses unique user IDs and passwords for the Order and Price API connections.
<b>Tag 50 and TT Direct Trader IDs</b>	<p>You can determine and set up any Group ID and Trader ID you like, however, you must use the Member ID as distributed by CME Globex. The exchange does not require members to identify each user individually.</p> <p>Additionally, CME Group requires all individuals to be uniquely identified within a Clearing Firm by using iLink FIX tag 50-SenderSubID. CME uses this tag to identify customers in the CME Group membership system and aggregate fees at the correct levels in their Exchange Fee System (EFS). Customers must check with their Clearing Firm Administrators to ensure that their FIX tag 50 has been registered for each trader.</p> <p>By default, the CME Gateway 7.15 maps FIX tag 50 to the <i>Trader</i> ID portion of the Direct Trader ID (i.e., <i>MemberGroupTrader</i> ID). On CME Gateway 7.16 and higher, Tag 50 is mapped to the TT Username (i.e., Universal Login ID) by default. This behavior is controlled by the <i>Sendersubid</i> parameter located in the <code>[order_session]</code> section of the <b>hostinfo.cfg</b> file. Refer to <i>Sendersubid</i> parameter description in the section called <b>Section: [order_session]</b> on page 125.</p> <p>You must complete the following fields in Guardian to map a TTORD proxy trader to a direct trader:</p> <ul style="list-style-type: none"> <li>• Exchange: The TT Gateway exchange-flavor (e.g., CME-A).</li> <li>• Member: A concatenation of the customer's SessionID and FirmID, both of which the CME assigns to the customer.</li> <li>• Group: A three-digit maximum variable defined by the firm.</li> <li>• Trader: A multi-digit (11 character maximum) variable defined by the firm.</li> </ul> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p><b>Note:</b> You must ensure that the Trader IDs are unique across your firm so that each trader (Direct Trader or TTORD) can be uniquely identified in the Tag 50 sent to the exchange by the CME Gateway.</p> </div>
<b>TTORD Trader IDs</b>	<p>The following lists how CME Gateways use TTORD trader IDs.</p> <ul style="list-style-type: none"> <li>• CME Gateways support TTORDs.</li> <li>• You can map multiple TTORDs to one direct exchange trader.</li> </ul> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p><b>Note:</b> Each TTORD ID connecting to and trading on the exchange must use a unique clearing account.</p> </div>
<b>FFT2 and FFT3 Fields</b>	<p>On CME Gateway 7.14, traders can use the FFT2 and FFT3 fields for account management; however, the CME Gateway does not require these fields. For CME Gateway 7.15 and higher, FFT2 and FFT3 values are not sent to the exchange and do not appear in any order acknowledgements or fills.</p> <p>When populated, CME Gateway 7.14 forwards the content of the FFT2 field as Tag 16102 to the exchange. In addition, CME Gateway 7.14 forwards the content of the FFT3 field as Tag 16103 to the exchange. The exchange ignores the values contained in FIX Tags 16102 and 16103, but both values return to the gateway from the exchange in order acknowledgements and fills.</p>

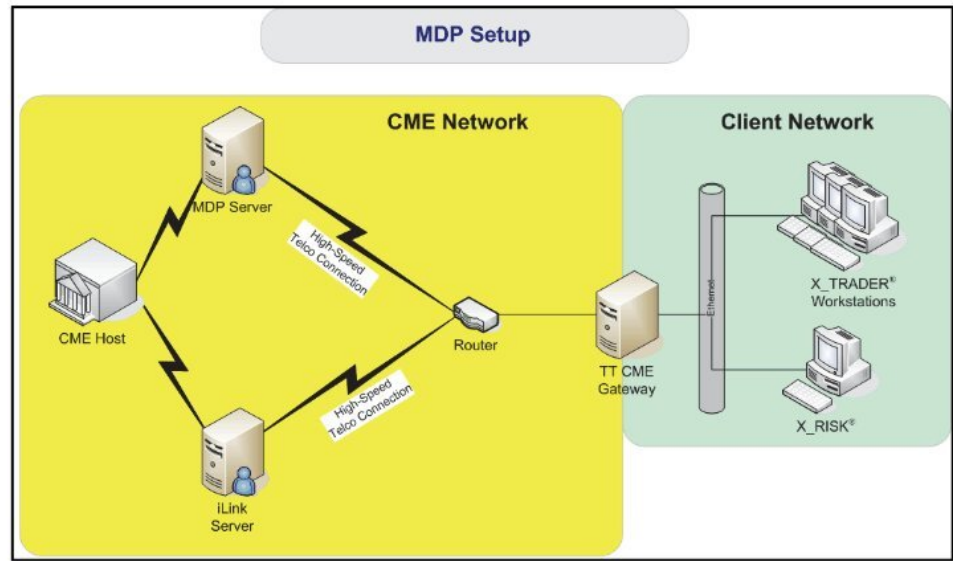


## Routing to the Exchange

### Network Configuration

CME Gateways provides access to exchange products on the CME Globex<sup>®</sup> platform by connecting to the following CME Globex interfaces:

- CME iLink<sup>®</sup>: The Order Server connects via FIX protocol to the CME Globex order routing interface.
- CME Market Data Platform (MDP): The Price Server subscribes to and receives prices from the MDP which is a dual-feed multicast market data dissemination system.



### Hardware and Software Requirements-TT

TT recommends all Gateway software be installed on server class machines. For server class machine specifications, refer to the *TT Trading Systems – Hardware and Software Requirements* document located on the TT Customer Portal.

### Hardware and Software Requirements-Exchange

CME Gateways communicate with the exchange via a number of different options that can be either customer or exchange managed. Different hardware and circuits will be utilized and provided, depending on which solution is chosen.

For specific details, please refer to the following CME Group website at:

<http://www.cmegroup.com/globex/trading-cme-group-products/network-access-options.html>.

## CME Gateway Architecture

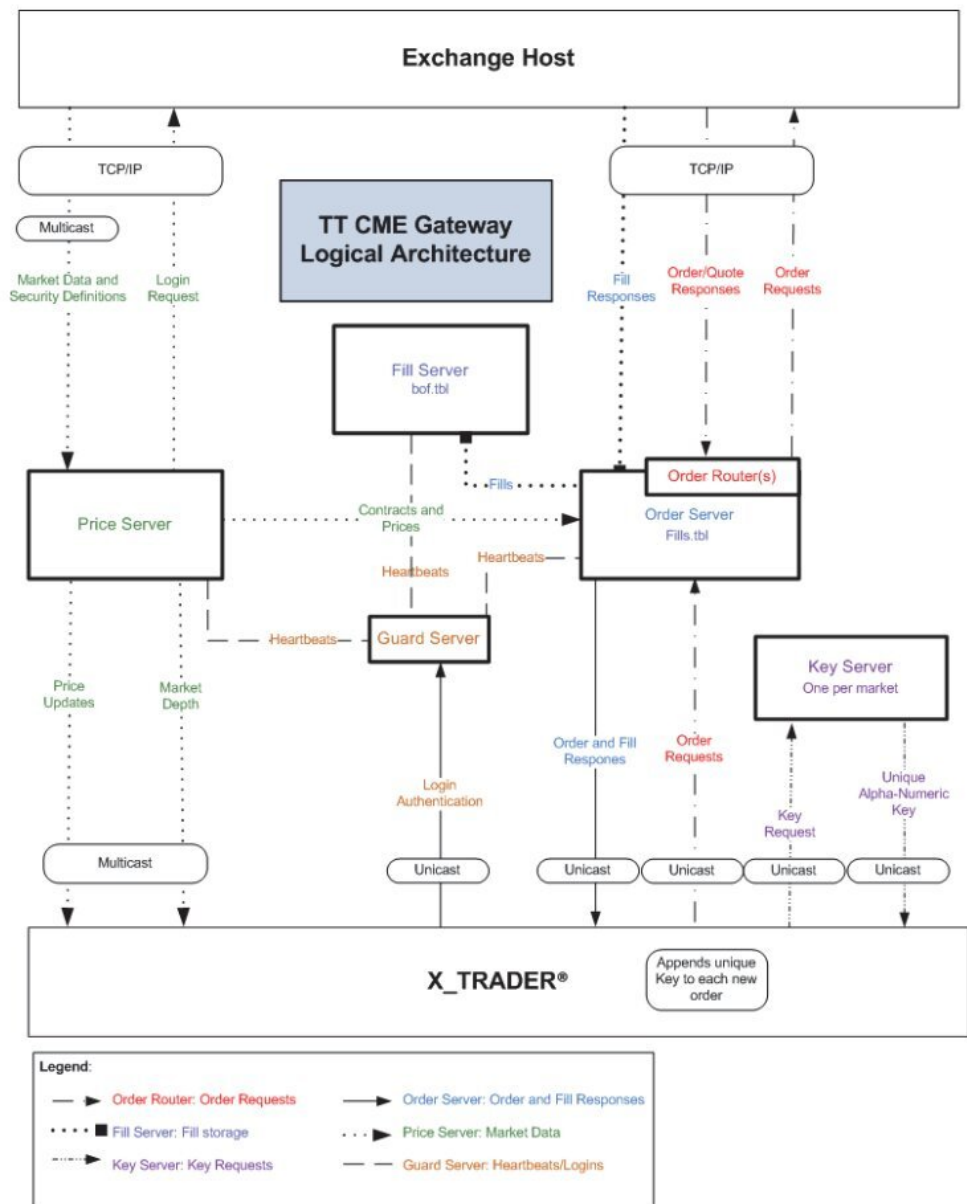
### Diagram Overview

In the Gateway Systems – Logical Architecture diagram, the following TT Gateway components are displayed:

- Fill Server
- Guard Server
- Key Server
- Order Server and Order Routers
- Price Server

For a description of each server component, refer to the *TT Gateways Architecture SAM Version 7.X*.

### Logical Architecture Diagram



## MDP Price Server

### Diagram Overview

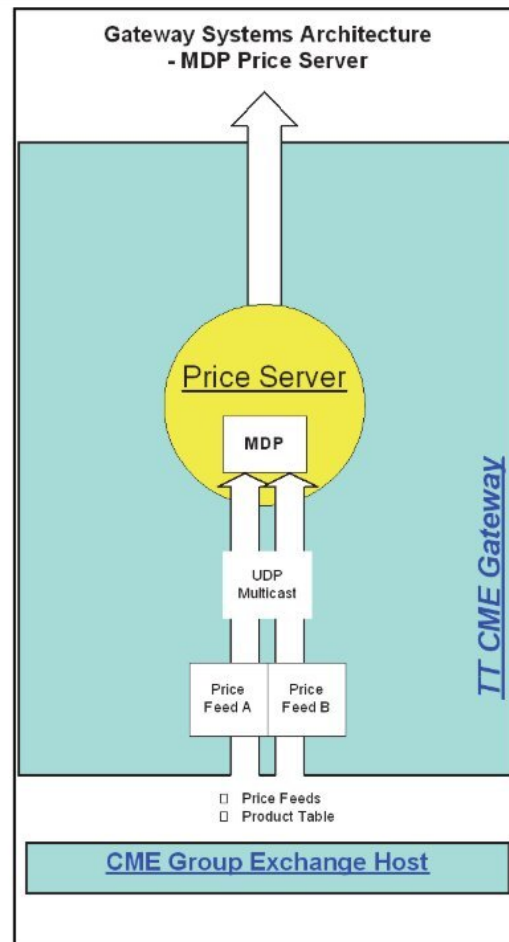
The Gateway Systems Architecture – MDP Price Server diagram illustrates the dual price feed connection the CME Group implements on the CME Gateway. Both price feeds connect via UDP for its price data. These feeds are referred to as Price Feed A and Price Feed B. The dual price feed approach provides the following functions:

- Connects to the CME Group.
- Provides a verification system for data delivery.
- Creates less packet overhead and throughput.
- Uses a UDP connection to communicate with and send price information to the MDP in the Price Server.

The CME Group transmits identical price data on both feeds along with sequence numbers that define which packets of data are present. If the TT Gateway discovers a missing sequence number, the Price Server updates with correct information after receiving the next price update.

When waiting for the next price update, the CME Gateway may temporarily remove market data. This information automatically repopulates when a new price update is received. For information on price transmission failures, see the section called **Gateway Recovery: Prices** on page 101.

### MDP Price Server Diagram



## Gateway Files 7.14.x

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### Overview

The following list details files that are used specifically by the CME Gateway. For a list and description of general TT Gateway files, refer to Chapter 3, "TT Gateway Configuration and Setup" in the *TT Gateway Architecture SAM Version 7.X*.

The files are divided into three types: configuration (**.cfg** or **.ini**), log (**.log**), and miscellaneous (**.tbl** and **.dat**). Due to space constraints, throughout the table, the following conventions are used:

- **\*** is the exchange name selected during the installation of the TT Gateway
- **SessionID** is the `SessionId` assigned to the particular Order Router that generates the file
- **MemberID** is the `MemberId` assigned to the particular Order Router that generates the file
- **time** consists of **HHMMSS**, where **HH** is the two-digit hour, **MM** is the two-digit minute, and **SS** is the two-digit second
- **mode** is either `PROD` (if the mode of the TT Gateway is set for production) or `SIM` (if the mode is set for simulation)
- **X** signifies **<root drive>**
- **#** is a variable integer.



Gateway Files Table

Type	Filename	Directory	Description	Deletable?
Binary	tt_mdp_listen.exe	X:\tt\exchange-flavor	TT MDP Listen executable	Yes
	tt_fast_listen.exe	X:\tt\exchange-flavor	TT FAST Listen executable	Yes
Config Files	*HostInfo.cfg	X:\tt\config	Stores the customer's connection information for the Price and Order Server	No
Log Files	Exchange-flavor_MemberID_Send-Recv_date.log	X:\tt\logfiles	Refer to the section called <b>FIX Log File</b>	Conditional
	*_Mode_OrderServer_Date.log	X:\tt\logfiles	Order Server log file	Yes
	*_Mode_PriceServer_Date.log	X:\tt\logfiles	Price Server log file	Yes
Misc. Files	*_*_mode_bof.tbl	X:\tt\datfiles	Fill Server file.	Conditional
	*_*_mode_fills.tbl	X:\tt\datfiles	An empty shell file.	Yes
	*_SessionIdMemberId_mode_orders.tbl	X:\tt\datfiles	The Order Server uses these files to track and manage its orders.	No
	*_SessionIdMemberId_mode_fills.tbl	X:\tt\datfiles	Refer to the section called Order and Trade Book Files	Conditional
	*_date.csv	X:\tt\auditfiles	Tracks trader logins, outgoing orders, and order responses that the exchange sends back to the TT Gateway. This file includes timestamps with each event	No
	*_MemberID_mode.dat	X:\tt\datfiles	The TT Gateway may have one or more of these XML files. The Order Server uses these files to track and manage FIX messages for a particular order session.	Conditional
	Exchange-flavor_Mode_ttqap.dat	X:\tt\datfiles	Used by the price server to continue calculating VAP for TTQAP-subscribed products after a startup.	No
	mdpl.bat	X:\tt\Exchange-flavor	Batch file that automates the mdplisten command	Yes

Table 3. Gateway Files

**FIX Log File**

During operation, the FIX engine within the Order Server generates a unique logfile for all FIX messaging (including heartbeats) sent between an Order Router on the TT Gateway and the CME Group host. Because the Order Server generates a log file for each Order Router, the filename of each log file contains the unique Member ID assigned to the Order Router in the **hostinfo.cfg** file. The timestamps on each message in the FIX log are in local time.

The FIX log files are created in the **<root drive>:\tt\logfiles** directory and uses the naming convention:

**Exchange-flavor\_MemberID\_Send-Recv\_date.log**, where *MemberID* is the Member ID assigned in the Order Router section in **hostinfo.cfg**. For CME Gateway 7.15.0 or higher, the name of the FIX log file shows the mode of the gateway and that the TargetCompID FIX tag is populated as "CME". The unique

**MemberID** is sent as the SenderCompID FIX tag and this is also reflected in the logfile name.

Whenever the Order Router sends or receives a FIX message, it writes the entire message to the **Exchange-flavor\_MemberID\_Send-Recv\_date.log** file.

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## Order and Trade Book Files

The Order Server uses several files to help manage and track all orders and fills that pass through the CME Gateway. The Order Server reads these files to memory and updates them whenever orders or fills are received. The TT Gateway stores these files in

**<root drive>:\tt\datfiles:**

- The **Exchange-flavor\_SessionIdMemberId\_Mode\_orders.tbl** files record all orders (i.e., working, filled, deleted, etc.) sent to the CME Gateway and their status. The rest of this manual refers to these files as the **orders.dat** files.

**Example:**

If you installed a CME-C Gateway in production mode, the file's name could be **CME-C\_PROD\_orders.tbl**.

- The **Exchange-flavor\_SessionIdMemberId\_mode\_fills.tbl** file contains a record of all fills received from the exchange for the specified session (*SessionIdMemberId*). The rest of this manual refers to this file as the **fills.tbl** file.

**Example:**

If you installed a CME-C Gateway in production mode, the file's name is **CME-C\_653ABC\_PROD\_fills.tbl**.

- The **Exchange-flavor\_MemberID\_mode.dat** file contains FIX messages and information relevant to that particular order session.

For detailed information on how the CME Gateway uses these files to reconstruct the Order and Trade Book during disaster recovery, refer to the section called **Single Gateway Failure** on page 101.

X\_TRADER<sup>®</sup> uses the Trade and Order book files to populate its **Fill** window and Order Book respectively whenever it connects to the CME Gateway.

## Gateway Files 7.15.x or Higher

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### Overview

The table in this section details files that are used specifically by the CME Gateway. For a list and description of general TT Gateway files, refer to Chapter 3, “TT Gateway Configuration and Setup” in the *TT Gateway Architecture SAM Version 7.X*.

The files are divided into three types: configuration (**.cfg** or **.ini**), log (**.log**), and miscellaneous (**.tbl** and **.dat**). Due to space constraints, throughout the table, the following conventions are used:

- **\*** is the exchange name selected during the installation of the TT Gateway.
- **SessionID** is the `SessionId` assigned to the particular Order Router that generates the file.
- **MemberID** is the `MemberId` assigned in **hostinfo.cfg** for the particular Order Router that generates the file.
- **time** consists of **HHMMSS**, where **HH** is the two-digit hour, **MM** is the two-digit minute, and **SS** is the two-digit second.
- **mode** is either `PROD` (if the mode of the TT Gateway is set for production) or `SIM` (if the mode is set for simulation).
- **x** signifies **<root drive>**
- **#** is a variable integer.



Gateway Files Table

Type	Filename	Directory	Description	Deletable?
Binary	tt_mdp_listen.exe	X:\tt\exchange-flavor	TT MDP Listen executable	Yes
	tt_fast_listen.exe	X:\tt\exchange-flavor	TT FAST Listen executable	Yes
Config Files	*HostInfo.cfg	X:\tt\config	Stores the customer's connection information for the Price and Order Server	No
Log Files	*_mode_MemberID_CME_send_rcv_date.log	X:\tt\logfiles	Refer to the section called <b>FIX Log File</b>	Conditional
	*_Mode_OrderServer_Date.log	X:\tt\logfiles	Order Server log file	Yes
	*_Mode_PriceServer_Date.log	X:\tt\logfiles	Price Server log file	Yes
Misc. Files	*_*_mode_bof.tbl	X:\tt\datfiles	Fill Server file.	Conditional
	*_*_mode_fills.tbl	X:\tt\datfiles	An empty shell file.	Yes
	*_mode_orders.tbl	X:\tt\datfiles	The Order Server uses these files to track and manage its orders.	Yes
	*_SessionIdMemberId_mode_fills.tbl	X:\tt\datfiles	Refer to the section called Order and Trade Book Files	Conditional
	*_date.csv	X:\tt\auditfiles	Tracks trader logins, outgoing orders, and order responses that the exchange sends back to the TT Gateway. This file includes timestamps with each event	No
	*_Mode_PositionByMGT	X:\tt\datfiles	Position are maintained in this file by the Fill Server for Fill Server Rollover.	Conditional
	*_mode_MemberID_CME_idx.dat	X:\tt\datfiles	Used by the TT Gateway to look up messages persisted in *_msg.dat.	Conditional
	*_mode_MemberID_CME_msg.dat	X:\tt\datfiles	Contains the actual FIX messages sent to the exchange.	Conditional
	*_mode_MemberID_CME_seqnum.dat	X:\tt\datfiles	Used by the Order Server for FIX session sequence number persistence. The TT Gateway may have one or more of these XML files.	Conditional
	Exchange-flavor_mode_ttqap.dat	X:\tt\datfiles	Used by the price server to continue calculating VAP for TTQAP-subscribed products after a startup.	No
	mdpl.bat	X:\tt\Exchange-flavor	Batch file that automates the mdplisten command	Yes

Table 4. Gateway Files

**FIX Log File**

During operation, the FIX engine within the Order Server generates a unique logfile for all FIX messaging (including heartbeats) sent between an Order Router on the TT Gateway and the CME Group host. Because the Order Server generates a log file for each Order Router, the filename of each log file contains the unique Member ID assigned to the Order Router in the **hostinfo.cfg** file.

The FIX log files are created in the `<root drive>:\tt\logfiles` directory and uses the naming convention:

**Exchange-flavor\_mode\_MemberID\_CME\_send\_recv\_date.log**, where *MemberID* is the Member ID assigned in the Order Router section in `hostinfo.cfg`. For CME Gateway 7.15.0 or higher, the name of the FIX log file shows the mode of the gateway and the targetCompId FIX tag value of "CME". The unique *MemberID* is sent as FIX Tag senderCompId and is also reflected in the logfile name.

**Example:**

```
CME_A_PROD_P16000_BVMF_send_recv_2011-10-23.log .
```

Whenever the Order Router sends or receives a FIX message, it writes the entire message to the **Exchange-flavor\_\_mode\_MemberID\_CME\_send\_recv\_date.log** file.

## Order and Trade Book Files

The Order Server uses several files to help manage and track all orders and fills that pass through the CME Gateway. The Order Server reads these files to memory and updates them whenever orders or fills are received. The TT Gateway stores these files in

`<root drive>:\tt\datfiles:`

- The **Exchange-flavor\_mode\_orders.tbl** file record all orders (i.e., working, filled, deleted, etc.) sent to the CME Gateway and their status. For CME Gateway Version 7.15.0 or higher, the name of this file has changed to reflect that one common file is created per Order Server. Refer to the following example.

**Example:**

If you installed **CME-C** Gateway 7.15.0 or higher in production mode, the file's name would be: **CME-C\_PROD\_orders.tbl**

- The **Exchange-flavor\_SessionIdMemberId\_mode\_fills.tbl** file contains a record of all fills received from the exchange for the specified session (*SessionIdMemberId*). The rest of this manual refers to this file as the **fills.tbl** file.

**Example:**

If you installed a CME-C Gateway in production mode, the file's name would be: **CME-C\_653ABC\_PROD\_fills.tbl**

- The **Exchange-flavor\_mode\_MemberID\_CME\_msg.dat** file contains FIX messages and information relevant to that particular order session and is used in conjunction with the **Exchange-flavor\_mode\_SessionId\_CME\_idx.dat** file, which the gateway uses to locate the messages in the `*msg.dat` file. The **Exchange-flavor\_mode\_SessionId\_CME\_seqnum.dat** file tracks sequence numbers of each message sent by the CME Gateway. The gateway syncs this number with the message sequence tracked by the exchange host.

For detailed information on how the CME Gateway uses these files to reconstruct the Order and Trade Book during disaster recovery, refer to the section called **Single Gateway Failure** on page 101.

X\_TRADER<sup>®</sup> uses the Trade and Order book files to populate its **Fill** window and Order Book respectively whenever it connects to the CME Gateway.

**Filename Differences:  
7.14 to 7.15 or Higher**

The table in this section summarizes the differences in filenames between versions 7.14 and 7.15 or higher of the CME Gateway.

The filenames that changed are log (**.log**) files and miscellaneous (**.tbl** and **.dat**) files. The following conventions are used in the table:

- **\*** is the exchange name selected during the installation of the TT Gateway
- **SessionID** is the `SessionId` assigned to the particular Order Router that generates the file.
- **MemberID** is the `MemberId` assigned to the particular Order Router that generates the file.
- **Mode** is either `PROD` (if the mode of the TT Gateway is set for production) or `SIM` (if the mode is set for simulation)
- **#** is a variable integer.

Type	7.14 Filename	7.15 Filename	Difference
Log Files	Exchange-flavor_MemberId_Send-Recv_date.log	*_Mode_MemberID_CME_send_recv_date.log	The 7.15 filename includes both the MemberID, which is sent as FIX tag SenderCompID and "CME," which is the FIX tag TargetCompID sent for each order action. The gateway mode is also included. <b>NOTE:</b> The timestamps on each message in the FIX log are now in local time instead of UTC.
Misc. Files	*_SessionIdMemberId_mode_orders.tbl	*_mode_orders.tbl	The 7.15 Gateway now creates one common orders.tbl file for all order routers (sessions) instead of separate files for each session.
	Exchange-flavor_MemberID_<Order#>.dat	*_Mode_MemberID_CME_idx.dat *_Mode_MemberID_CME_msg.dat *_Mode_MemberID_CME_seqnum.dat	CME Gateway 7.15 uses three files to persist FIX messages and their related sequence numbers: the index file, message file, and sequence number file.

**Table 5. Gateway Filename Differences: 7.14 to 7.15**

## File Management

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### Log File Management

The CME Gateway is designed to erase all of its own log files older than ten days. TT recommends that you delete all log files older than a month on a regular basis. Before deleting them, you can also back up these files if needed for auditing purposes.



**Tip:**

- You can set up `ttclean.ini` to automatically delete or archive the log files on your TT Gateway.
- For information on `ttclean.ini`, refer to the TT Gateway Architecture SAM Version 7.X.



## Audit File Conversion

The Order Server creates audit files that contain a variety of order and fill information. Located in the **<root drive>:\tt\auditfiles** directory, the audit files follow the naming convention: **Exchange-flavor\_YYYY-MM-DD.cba** where **DD** is the two-digit day, **MM** is the two-digit month, and **YYYY** is the four-digit year.

When requested, you must provide a readable copy of the audit files to the CME Group. Use the **audit\_convert.exe** program to convert the audit file into a readable copy. You can use this program to either convert all audit files in a directory or to convert a single audit file.

For general information on audit files, refer to **Appendix B, System Files** in the *TT Gateway Architecture System Administration Manual Version 7X*.

### ► To convert a single audit file:

1. Open a Command window.
2. Type: `audit_convert.exe absolutefilename`

Where *absolutefilename* is the path and filename of the audit file you want to convert.

#### **Example:** Single Audit File:

```
audit_convert.exe c:\tt\auditfiles\CME-A_2007-10-08.cba
```

3. To close the **Console** window, type `Exit`.

### ► To convert multiple audit files:

1. Open a Command window.
2. Type: `audit_convert.exe directory exchange-flavor`

Where:

- *directory* is the location of your audit files.
- *Exchange-flavor* is the name of the TT Gateway that produced the audit files.

#### **Example:** Audit Files on a CME-A Gateway:

```
audit_convert.exe c:\tt\auditfiles CME-A
```

3. To close the **Console** window, type `Exit`.

## Formatting Audit Files for CME Group

**Note:** CFTC Commission regulations define what types of electronic trading information need to be recorded by trading firms (FCMs, IBs, etc.) and serve as a basis for the CME Group's regulatory requirements. It is your responsibility to ensure that your recorded data meets these requirements. For an explanation of the regulatory requirements for connecting to and trading on the CME Globex platform, refer to: <http://www.cmegroup.com/globex/resources/cme-globex-regulatory-documents.html>

Contact the CME Group to ensure that your recorded data meets their audit requirements and is in compliance with CFTC Commission regulations. To assist in this task, TT provides a script that you can use to format the data before sending it to the CME Group. After converting the CME Gateway audit file into a readable format (.csv file), you need to format it for auditing purposes. When requested, you must provide a copy of the formatted file to the CME Group.

### Before You Begin

You need to do the following before formatting the file using the TT script.

- Complete the Audit File Conversion procedure. Refer to the section called **Audit File Conversion** on page 28.
- Download **CME Audit File Formatter Macro - 7.x** (i.e., CME Logger) from the TT customer portal at: <https://customernet.tradingtechnologies.com/Extranet>

To find this script on the portal click **Products** and **Downloads**, select **Support Tools** from the **Product Type:** drop down menu and click **Go**.

### ► To format audit files for the CME Group

1. Double-click the CME Logger file (e.g., **cmelogger\_3.0.3.5.xlam**) to open it in Excel®.

**Note:** The CME Logger file is compatible with Excel 2007 and Excel 2010.

2. Click **Enable Macros** in the **Microsoft Office Excel Security Notice** window:



3. Select **TT Audit** from the Excel tool bar.



4. In the **CME Convert** tool bar, click **Select File** and open the **Exchange-flavor\_YYYY-MM-DD.csv** file.



The \*.csv file is located in **<root drive>:\tt\auditfiles**

**Note:** TT recommends opening the \*.csv file using **Select File** instead of File Open, the Open (Ctrl+Q) command, or a drag-and-drop of the file in Excel.

5. Click **Convert Data**

Result:

CME Logger formats each column in the.csv file. The macro displays a **Processing completed successfully** message when formatting is complete.

6. Click **Save As** to save the changes as **Exchange-flavor\_YYYY-MM-DD.xls** and send this formatted file to the CME Group.

## Preparing to Install

### Customer Tasks

Before the CME Gateway is installed, the customer must perform the following tasks:

- Obtain the host server IP addresses, Firm ID, associated passwords, and connection ports. CME Group distributes this information in a separate document (or E-mail). You must obtain one set of connection information for each Order Router or customer membership that uses the TT Gateway.
- For circuit sizing (network bandwidth) between your network and the CME Group host, refer to the CME Group specifications.
- Confirm that all network routes to CME Group work from the server onto which TT plans to install the TT Gateway.
- Obtain the IP address that CME Group defines for your TT Gateway. You must use this IP address as either the NATed address (if you are using a NAT firewall) or the address of the NIC that faces the CME Group network (if you are using a dual-homed server).
- For each connection to CME Group, obtain the SessionId from CME Group.

The following are customer tasks specific to networking and network setup:

- CME Group distributes its MDP price streams via multicast traffic to a network area that you define for CME Group.
- For history data requests, you must enable TCP connections on the TT Gateway.
- The IP address and subnet mask that the customer sends to CME Group for the Price Server MDP connection should be that of the local LAN facing NIC on the CME Gateway.
- When setting up IP addresses, the customer must make sure that they are fully resolved through any NAT firewalls and NAT routers that are used.



**Warning:** TT does not support or recommend using NAT IP addresses to connect to the CME Group. CME Group holds you fully responsible for all maintenance regarding NAT IP addresses. You must consult the exchange for all NAT implementation details.

- On all network devices that reside between the CME Gateway and the CME Group host network, the customer must ensure that the Primary port used in the hostinfo.cfg file is available for one-way, outbound TCP sessions to the CME Group host servers.
- Obtain network connectivity information from CME Group for the remote host IP addresses and ports to which the CME Gateway must connect and the names of the customer-side routers.



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**Installer Tasks**

**Note:** You must observe the following when installing a CME Gateway:

- When performing any of the tasks of the CME Gateway installation, you must be logged into the gateway server with Administrator rights.
- Procedures and tasks presented in this manual supplement the information stored in the TT Gateway Architecture SAM Version 7.X.

As the installer, you must perform the following tasks before installing the CME Gateway:

- If you have TT products of Version 7.X already installed on the network, you must obtain the `aconfig.xml` file from one of the machines that hosts the 7.X software. This can be from any 7.X machine on your network.
- Identify the instruments (i.e., products) to which the customer's memberships want to subscribe. You must add this information to the `[price_session]` section of the `hostinfo.cfg` file; no more than 14 channels can be subscribed to per gateway. Refer to the section called **Section: [price\_session]** on page 120.
- If the CME Gateway uses multiple NIC cards, identify the IP address of each Network Interface Card (NIC) that faces CME Group's network.
- Obtain from the customer all membership connection information for memberships that use the CME Gateway. CME Group distributes these values to the customer. Refer to the section called **HostInfo.cfg** on page 115 for a list of all needed values.

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**Installation Requirements**

You can install TT Gateways 7.15.x or lower on machines running Windows Server 2003.

In addition, you can install the following TT Gateways on a machine running Windows Server 2008 R2 Service Pack 1:

- TT Xetra Gateway 7.X
- TT Montreal, CBOE and FIX Gateways 7.13
- All TT Gateways 7.14 and 7.15

Prior to installing 7.15 or lower on Windows Server 2008, you must be aware of the following caveats and required changes:

- **Migrating to Windows Server 2008:** TT does not support upgrading the operating system on an existing TT Gateway server. TT strongly suggests that users perform a clean install of the operating system and the TT Gateway when migrating to Windows Server 2008.

- **Program Files directory:** Windows Server 2008 does not allow applications to create files under the Program Files directory.

If during a command line installation of the TT Gateway, you place the install root in the Program Files directory, you must select a different location for the `tt\config`, `tt\datfiles` and `tt\logfiles` directories by using the `installconfig`, `installdata` and `installlog` arguments.

- **Event Viewer Errors:** Certain TT applications may trigger minor Event Viewer error messages. These errors do not impact gateway behavior. However, users can avoid triggering these messages by starting the Windows **Interactive Services Detection** prior to install.
- **Console Windows:** By default, some console windows triggered by TT Gateways may not display and instead produce an Interactive Service Detection dialog box. Users may run the **Interactive Services Detection** and switch over to the Windows "Session 0" desktop to view messages displayed from server.

- **Starting Programs:** TTChron may not properly close and/or monitor server programs that are started manually. Users should first start TTChron and allow it to start the server program per its schedule.
- **Start TTChron desktop icon:** The "Start TTChron" desktop shortcut may not work unless the user right-clicks on the icon and select "Run as administrator" from the context menu.
- **TTM\_BASE\_API error:** An issue exists where TTM may trigger a TTM\_BASE\_API error message in the Event Viewer. This is a known issue with TTM and does not impact gateway behavior.
- **User Account Control:** You must disable the Windows User Account Control for the TT Gateways to properly function. The User Account Control prevents the gateway from updating files including changes to the **aconfig.xml** file and updates to the product table.

TT Gateways Version 7.15 and higher no longer include TT Server Admin; however, you can perform many of the same tasks with TT User Setup.



**Warning:** Upgrading an existing Gateway to Version 7.15 automatically removes TT Server Admin from the server machine.

## Installing

### Before you Install

The CME Gateway installs the following software packages, which also can be uninstalled using the **Add or Remove Programs** dialog box:

- TT Chron
- TT Guardian
- CME Gateway Components (includes standard TT Gateway files and utilities)

In addition, CME Gateways install with pMerge which is removed during a CME Gateway uninstall.



**Warning:** The CME Gateway Version 7.13.0 and higher will abort an installation or upgrade if your machine is running Windows 2000. Before installing or upgrading to Version 7.13.0 and higher, you must ensure that your machine is on a version of the Windows platform supported by TT. Please refer to the [TT Trading Systems - Hardware and Software Requirements Version 7.X document](#) for details.

### Note:

- If you previously installed TT software onto your machine, the gateway software automatically installs to the same drive.
- Depending upon the environment of the machine on which you install the TT Gateway, you may receive several informative or question prompt boxes. If a task discusses such a prompt box, and you do not receive the prompt box, skip to the next step.

### Installing the TT Gateway Software

#### ► To install the CME Gateway

1. Run the CME Gateway setup.

The License Agreement dialog box displays.



2. Read the **End User License Agreement**.
3. To accept the license agreement and continue with the installation, select the box next to **I accept the terms in the license agreement** and click **Next**.

The **Setup Type** dialog box may appear with the option to **Install Now** or **Customize**:



If this is the first TT product installed on this machine, the **Install Now** option installs the CME Gateway to the **c:\tt** directory by default.

If the installation detects previously installed TT products, the **Install Now** option installs the CME Gateway in the same directory as your other TT products.

To install the CME Gateway into the default directory, select **Install Now** and click **Next**. Skip to step Step 6.

- To install the CME Gateway in a custom directory, select **Customize** and continue with the step below.

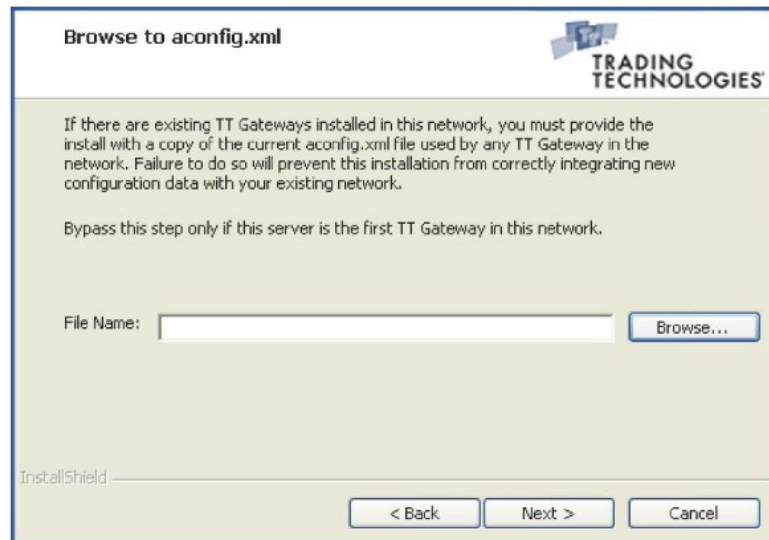
4. The **Customize Destination Folders** dialog box appears:



Select **Browse** and navigate to the location you want to install the CME Gateway.

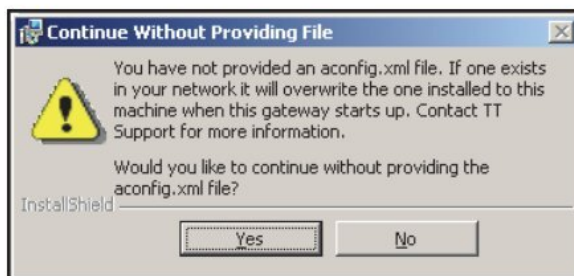
5. Click **Next**.
6. The **Browse for aconfig.xml** dialog box appears.





- If this is the first TT product on your TT Trading System, continue with Step 7.
  - If you provide an aconfig.xml file, skip to Step 9.
7. Click **Next**.

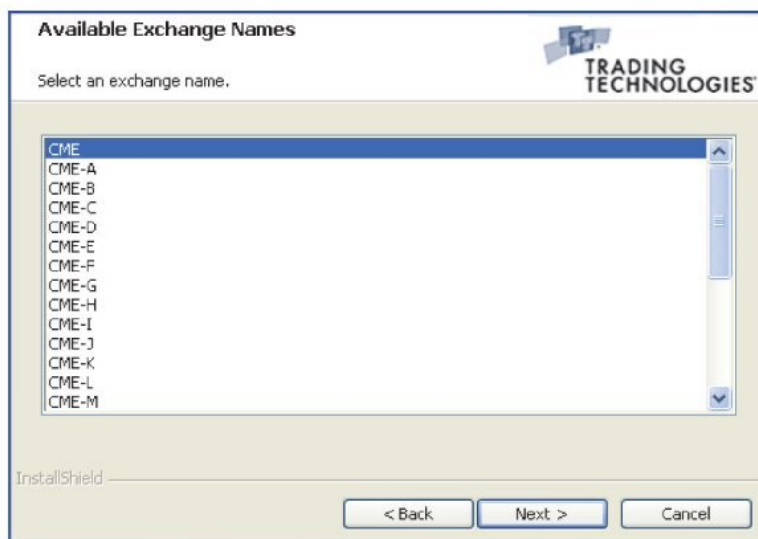
A **Continue Without Providing File** prompt appears asking you whether you want to continue.



8. Click **Yes**, and skip to Step 10.

Your CME Gateway installs with its customized **aconfig.xml**. For information on how the TT system replicates **aconfig.xml** across your TT system, refer to the *TT Gateway Architecture SAM Version 7.X*.

9. You must supply the **aconfig.xml** that you use so that the install package updates it with new Gateway exchange names.
  - Click Browse.
  - Navigate to the location of your aconfig.xml file.
  - Double-click the file, and then click Next.
10. The **Available Exchange Names** dialog box displays with a list of CME Group flavors (i.e., *exchange-flavors*).



Click the *exchange-flavor* that you want your TT Gateway to display in Guardian. Select the same *exchange-flavor* that is listed on the TT license file.

To trade on the TT Gateway, traders must log into this TT Gateway *exchange-flavor*. This *exchange-flavor* appears in Guardian's tree of exchanges.

11. Click **Next**.
12. The **Locale Information** dialog box appears:

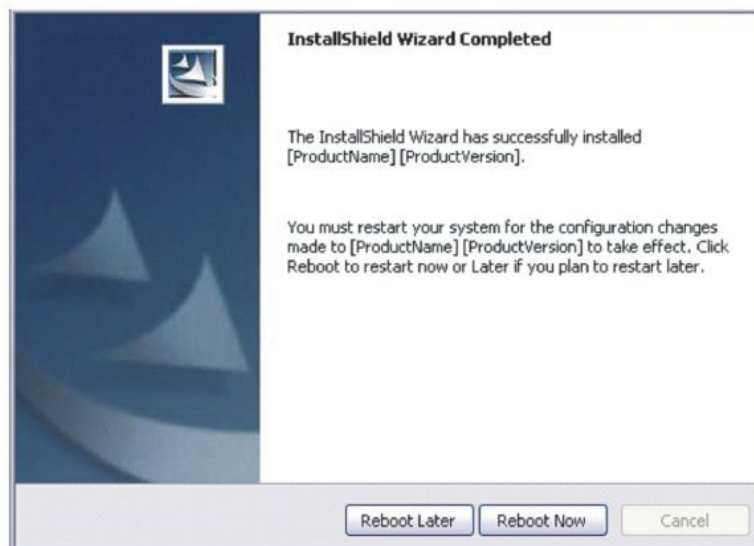
In the **Country Code** drop-down list, select the country in which the Gateway runs. If the Gateway operates in the United States, you must also enter your Zip Code in the **Zip Code** field.

The Gateway stores this information in the **location.cfg** file located in the **<root drive>:\tt\config** directory.

To continue the installation, click **Next**.

13. The **InstallShield Wizard** reboot dialog box appears, where:

- [ProductName] is CME Gateway
- [ProductVersion] is Version 7.X



To complete the installation and reboot your machine, click **Reboot Now**.

To exit the installer and reboot your machine later, click **Reboot Later**. TT recommends rebooting your machine prior to operating the CME Gateway.

## Installing with the Command Line Interface

---

### Overview

Use the command line interface to expedite the installation process by suppressing some or all of the dialog boxes that appear during a GUI installation. This becomes particularly useful when installing multiple instances of the CME Gateway.

When entering the command, use the following syntax:

***packagename.exe*** -a --argument1=value --argument2=value where:

***packagename.exe*** equals the name of the executable file (e.g., **cme\_r7.15.2.0p27.exe**).

-a identifies that arguments follow in the command.

--argument1 equals the arguments you wish to use from the table below.

---

### Creating an Install Configuration File

For multiple installs, you can open a text editor, such as Notepad, and create an install configuration file that contains a list of arguments you wish to use. When creating an install configuration file, you must list each argument on a separate line.

#### Example: Install Configuration File

```
installroot=c:\program files\tt
exhangelname=CME Group-B
countrycode=US
zipcode=60606
reboot=force
```

Once created, you can rename the file. Then, you can begin the installation by adding the filename to the **--installcfg** argument. The example below shows the command line argument to install CME Group package 27 using a install configuration file named **Install.txt** located on the C:\ drive:

```
cme_r7.15.2.0p27.exe -a --installcfg=c:\Install.txt
```



## Installing via Command Line Interface

### ► To begin the command line installation:

1. Download the package executable file from the TT Customer Portal. To simplify the install, place the file on the server's **<root drive>**.
2. Open a command window by selecting **Run** on the **Start** menu and typing `CMD`.
3. When the command window appears, use the `cd <root drive>:\` command to navigate to the location of the executable.
4. Enter the name of the executable file followed by `-a` and the arguments you wish to use.

#### Example: Installation Arguments for the CME Gateway:

Entering:

```
cme_r7.15.2.0p27.exe -a --installroot=c:\program files\tt
--exchangenname=CME-B --countrycode=US --zipcode=60606 --reboot=force
```

causes the CME Gateway installation to perform the following:

- The Gateway installs into the `c:\program files\tt` directory
- The exchange-flavor equals **CME-B**
- The country code equals `US` and the zip code equals `60606`
- The server automatically reboots after the install completes

Argument	Function
<code>--aconfigxml=&lt;file location&gt;</code>	Specify the path to an existing <b>aconfig.xml</b> file. Suppresses the <b>Browse for aconfig.xml</b> dialog box and uses the provided network <b>aconfig.xml</b> file.  Using this argument causes the installation to update the revision count on the existing network <b>aconfig.xml</b> file.  <b>Warning:</b> Do not use the <code>ovr</code> command when supplying an existing network <b>aconfig.xml</b> file.
<code>--countrycode=&lt;2-digit countrycode&gt;</code> <code>--zipcode=&lt;zipcode&gt;</code>	Suppresses the <b>Locale Information</b> dialog and adds the country code and zip code values to the <b>location.cfg</b> file.  You must supply both arguments.
<code>--exchangenname =&lt;Exchange-Flavor&gt;</code>	Suppresses the <b>Available Exchange Names</b> dialog and sets the Exchange-Flavor for the CME Gateway.
<code>--reboot=force</code>	Sets the server's behavior following the installation. The <code>--reboot</code> command uses the following values: <ul style="list-style-type: none"> <li>• <code>norestart</code>: The installation does not reboot the server. In addition, the installation suppresses the <b>Reboot Now</b> dialog.</li> <li>• <code>force</code>: The installation reboots the server without displaying the <b>Reboot Now</b> dialog.</li> <li>• <code>promptrestart</code>: The installation displays the <b>Reboot Now</b> dialog.</li> </ul> <b>Note:</b> If the <code>--reboot</code> command is not present, the installation exhibits the default behavior.

**Table 6. Installation Arguments**

Argument	Function
--skipdesktop	Sets the installation to not add desktop icons.
--ttmdcfg=ttmd.cfg, ovr	Sets the location of the <b>ttmd.cfg</b> file. You must set this value equal to <b>ttmd.cfg</b> . In addition, you must add the <code>ovr</code> argument to overwrite an existing <b>ttmd.cfg</b> file.
<b>Install Location Arguments</b>	
<b>Warning:</b> The following arguments only apply if this is the first TT product installed on the server. Subsequent installations automatically write to an existing TT folder, even if you supply the following arguments.	
--installroot=[path]	Sets the directory path for all install files and folders and suppresses the prompt for installation path during first time installations.
--installconfig=[path]	Suppresses the <b>Customize Destination Folders</b> dialog and sets the location for the <b>hostinfo.cfg</b> , <b>custommultipliers.cfg</b> , <b>ttchron.ini</b> and <b>ttclean.ini</b> configuration files. Also, this argument sets the location of additional TT component configuration files (i.e., <b>ttmd.cfg</b> , <b>DNModifications.cfg</b> ).
--installdata=[path]	Sets the location for system data files.
--installuserdata=[path]	Sets the location for user data files.
--installlog=[path]	Sets the location for log files.
--installpathlist=[pathlist]	Sets the location for all files listed above (i.e., configuration, log, user, and system data files). The value of this parameter must equal a comma separated list of installation paths that must include the installroot and must appear in the following order: installroot,installconfig,installlog,installuserdata,installdata Any omitted values causes those files to be written to the installroot location. <b>Note:</b> You can not add this argument to an installation configuration file.

**Table 6. Installation Arguments**

<b>Additional Installation Arguments</b>	TT Gateways 7.16 and higher support an additional command line argument for setting the gateway mode on install.
--	--

Argument	Function
--gwinstallmode=[mode] where [mode] equals either 1, 2, or 3	<p>Sets whether the user performs a 'traditional' (i.e., install all TT Gateway components) or a limited, component-specific install.</p> <p>This setting has three options:</p> <ul style="list-style-type: none"> <li>• <b>1:</b> Traditional mode - installs all components for market data and orders/fills including the Price Server, Order Server, Fill Server, and GuardServer. For Eurex Gateways, this option also installs the OTC Router.</li> <li>• <b>2:</b> Order/Fill mode - only installs components required for orders and fills including the PriceProxy (as a service only) and Order Server, Fill Server, and GuardServer. For Eurex Gateways, this option also installs the OTC Router.</li> <li>• <b>3:</b> MPF mode - only installs components required for market data including the Price Server and GuardServer.</li> </ul>

**Table 7. Additional Installation Arguments**

**Note:** You must use the **-a** command prior to passing any command line argument.

### *Post-Install*

If using the **--gwinstallmode** argument to install an order/fill or MPF mode gateway, you must manually update the **ttchron.ini** and **hostinfo.cfg** files to comment-out the sections for the uninstalled services by adding a hash (#) symbol before each line in the section.

When installing an order/fill gateway with **--gwinstallmode=2**, you must comment-out the Price Server section.

When installing an MPF gateway with **--gwinstallmode=3**, you must comment-out the Order Server, Fill Server, and Order Router (if applicable) sections.

### *Upgrading*

You cannot use the **--gwinstallmode** argument to change an existing gateway's mode. When upgrading an existing gateway, the **--gwinstallmode** argument is ignored and the gateway automatically installs in the same mode as the existing gateway.

You must uninstall the existing gateway prior to installing the gateway in a different mode.



## Upgrading

### Preparing to Upgrade



**Warning:** The CME Gateway Version 7.13.0 and higher will abort an installation or upgrade if your machine is running Windows 2000. Before installing or upgrading to Version 7.13.0 and higher, you must ensure that your machine is on a version of the Windows platform supported by TT. Please refer to the [TT Trading Systems - Hardware and Software Requirements Version 7.X document](#) for details.

You can upgrade to a higher version of the CME Gateway by running the installation package on the same machine.

#### Stopping Services

Prior to running the installation package, the user must manually stop all TT Gateway services.

Running the installation package automatically stops the following TT-related processes: TT Chron, SNMP, TT Guardian, TT Guardian Server, TT Guardian Control, TTMRD, and TTMD.

**Note:** Failure to stop all services causes the installer to log the following message in the installation logfile:

```
Error: Service <ServiceName> failed to stop. Please shutdown all TT
applications and then re-launch this install.
```

If this message appears, you must manually stop the service(s) and restart the CME Gateway setup.

#### Backing Up Audit Files

If upgrading intraday, you must backup and rename the Audit File which was created that day. Audit Files are version specific. Due to potential changes, TT strongly recommends that you backup and rename the day's Audit File. This allows the upgraded TT Gateway to create a new version of the day's Audit File and avoid any potential errors.



**Warning:** Audit Files that contain content from multiple TT Gateway versions cannot be converted with the Audit Convert tool.

Failure to begin a new file when upgrading the TT Gateway results in an 'Unknown record type' error message and potentially lost data.

TT strongly recommends that you backup and rename the day's Audit File if upgrading intraday.

For information about updating your configuration files when upgrading, refer to the section called **Master Files** on page 44.

### Product Dependencies

The following is a list of the minimum client application versions that support the PFX wire format. You need to upgrade to these versions in order to support PFX in your trading environment.

**Note:** To achieve optimal performance and reliability, TT recommends that you install the most current production release available for each of the products listed in this section.



Client Applications	Availability
X_TRADER® 7.7.3	Released
X_TRADER API 7.5.0	Released
FIX Adapter 7.5.0	Released
Price Proxy 7.1.0	Released
X_STUDY™ 7.3	Released
X_RISK® 7.4.1	Released
AutoSpreader® 7.0.0	Released
FMDS 7.4.3	Released

**Table 8. PFX-Capable Client Applications**

CME Gateways require these versions, or higher, to also support the following:

- FIX Adapter 7.2.3 or higher: Contains fixes for issues related to the sharing of market IDs and additional contract issues.
- User-Defined Strategies: X\_TRADER® 7.5.2 and higher is needed to display user-defined strategies that enter the market. This allows users to process and trade user-defined strategies that are working in the market. X\_TRADER® 7.6 or higher is needed to create a UDS.
- For client applications that support the CME Group’s Mandatory iLink Tag requirements, refer to the section called **Upgrade Tasks to Support Mandatory iLink Tags** on page 102.

Please contact your TAM to determine configuration changes and requirements specific to your trading environment.

## Master Files

To help accurately update your configuration files during upgrades, CME Gateways install with the following template “Master” configuration files located in the **<root drive>:\tt\Exchange-Flavor** folder:

- hostinfo.cfg\_master
- ttchron.ini\_master
- ttclean.ini\_master
- mdp.cfg\_master
- fast.cfg\_master

**Note:** You should not manually update the fast.cfg file. During upgrades, CME Gateways overwrite the existing fast.cfg file with the proper settings. The fast.cfg\_master file serves solely as an additional reference for troubleshooting.

- ttclean.ini

These files contain updated settings and parameters for the upgraded version of the TT Gateway. When upgrading, the CME Gateway retains your previous configuration settings. After installing, you can update your configuration files by copying the relevant changes from the Master files to your existing configuration files. This is illustrated in the following procedure:

### ► To update your existing configuration files using the Master files as reference:

1. Open both the existing configuration file and the related Master File.

## 2 Installing and Upgrading

2. Copy changes from the Master File and paste into the relevant sections of the original configuration file.
3. Save your changes and close both files.

You can continue to edit your configuration files as described in the configuration sections.

## Uninstalling

---

### Overview

Use the procedure in this section to uninstall a TT Gateway.

---

### Uninstalling the TT Gateway

#### ► To Uninstall a TT Gateway

1. Click **Start**, then select **Control Panel** and click **Add or Remove Programs**.
2. Select the TT Gateway and click **Remove**.  
The **Add or Remove Programs** Screen appears.
3. Click **Yes** to begin uninstalling the TT Gateway.
4. Repeat these steps for each TT Gateway child component (TTChron, TT Guardian, TT Messaging).

## Initial Configuration

### Time and Time Zone

Due to the default settings in its configuration files, TT recommends that you set the TT Gateway to run in the CST time zone (Chicago time) with Daylight Savings enabled.

If you decide to run the CME Gateway in another time zone, you must:

- Run the CME Gateway in the correct time zone and daylight savings setting associated with that time zone.
- Adjust the times in **ttchron.ini** to match the time in which the CME Gateway runs.
- Adjust times in Fill Server section of the **aconfig\_local.xml** file.

#### Example:

Trading Firm ABC based in Indianapolis decides to run the CME Gateway in the Indiana time zone. ABC sets the system clock to Indiana time, which is CST, and turns off daylight savings. Whenever Daylight Savings changes, ABC edits **ttchron.ini** to account for new time schedules.



**Warning:** You must restart the Price and Fill Servers after changing the time settings in the **aconfig\_local.xml** file.

### Aconfig Time Zone Parameters

You must pay close attention when configuring the time zone settings located in the **Aconfig.Core.Server.Exchange-Specific.Exchange-flavor.Time.Zone** directory. These settings directly impact price and fill server operation.

When resetting these parameters, you must restart both the Price and Fill Servers.



**Warning:** Failure to restart the Price and Fill Servers after changing the Aconfig time zone setting can result in missing fills.

### Account Names

The CME Group restricts account names to a maximum length of 12 characters. For longer account names, the exchange truncates any additional characters beyond the 12 character limit. This results in orders being rejected by the exchange.



**Warning:** Users must use account numbers that do not exceed 12 characters in length. If your account name exceeds the 12 character limit, CME Group will prevent you from sending orders to the exchange.

### Member, Group, and Trader ID Format

TT Trader IDs on CME Gateways use the format `SessionIdFirmIdxxxxyy`, where:

- The CME Group determines the values of `SessionId` and `FirmId`. Trader's use this concatenation as their Member ID when logging into X\_TRADER®.
- To better manage trader groups, if the customer wants to use a custom FirmID, they may do so. However, the customer must communicate this to



the CME Group; CME Group will map the custom FirmId to a SessionId that you use.

- xxx is the customer defined group ID. Customers can use any value.
- yyy is the customer defined trader ID. Customers can use any value.

---

**Key Range**

CME Gateways install with the following default key range: 020000-02zzzz.

## Configuring the Trading Environment

<b>Overview</b>	<p>After installing the TT Gateway, you must perform the following procedures:</p> <ul style="list-style-type: none"> <li>• Stop all TT-related services.</li> <li>• Configure <b>Exchange-flavorhostinfo.cfg</b> (referred to throughout simply as the <b>hostinfo.cfg</b> file) and edit the <b>ttchron.ini</b> file.</li> <li>• Concerning tick tables, in 7.X, CME Gateways use pMerge to populate their product and tick tables. You no longer need to manually configure tick table.</li> <li>• Configure time zone settings in <b>aconfig_local.xml</b>. Do not modify any other <b>aconfig</b> default settings without first contacting your local TAM.</li> </ul>
<b>Stopping TT-Related Services</b>	<p>Before configuring the TT Gateway, you must stop all TT-related services.</p> <p>▶ <b>To stop Services:</b></p> <ol style="list-style-type: none"> <li>1. From the <b>Start</b> menu, point to <b>Settings</b>, and click <b>Control Panel</b>. The <b>Control Panel</b> opens.</li> <li>2. Double-click <b>Administrative Tools</b>. The <b>Administrative Tools</b> window displays.</li> <li>3. Double-click <b>Services</b>. The <b>Services</b> window displays.</li> <li>4. Scroll through the <b>Services</b> box to locate TT Chron.</li> <li>5. Right-click <b>TT Chron</b>, and then click <b>Stop</b>.</li> <li>6. If there are any other TT Services running, you must stop them as well. One at a time, right-click the TT service, and then click <b>Stop</b>.</li> <li>7. After you have stopped all TT services, close the <b>Services</b> and <b>Administrative Tools</b> windows.</li> </ol>

**TTChron.ini**

Located in **<root drive>:\tt\config**, all services in the **ttchron.ini** file must be set with the correct startup and shutdown times. For information and restrictions on configuring **ttchron.ini**, refer to the *TT Gateway Architecture SAM Version 7.X*.

**Note:** On the CME Gateway, Order Routers are threads managed by the Order Server. The **ttchron.ini** file does not have an Order Router section.



**Warning:** The following warnings apply to the CME Gateway startup and the use of **ttchron.ini** on the CME Gateway:

- You must set the Order Server to start up on Sunday before the CME Group. If the Order Server starts up for the first time that week at a later date, you must start it up using the **-r** command line option. If the Order Server cannot startup after a failure (i.e., it has been already running smoothly that week), refer to the section called **Single Gateway Failure** on page 101.
- Leave TTChron running after installing and configuring the CME Gateway.

► **To edit the ttchron.ini file:**

1. Verify that the time to start for the Price Server is set to 10:30 CST.  
This setting ensures that the CME Gateway captures the correct product listings. If the Price Server starts after the exchange starts broadcasting products, the CME Gateway can have incorrect products listings.
2. Verify that the time to stop on Fridays for the Order Server is set to 16:30 CST.  
This setting prevents stale orders that could arise if the Order Server runs too long on Fridays and eventually gets disconnected by the exchange.
3. Use this information to determine the correct startup times for all CME Gateway processes. Since the CME Group can change its trading hours at any time, specific startup times are not included in this document. The times provided in the **ttchron.ini** file are representative of the current exchange startup times. Unless otherwise informed by TT or CME Group, do not change these times.

**Note:** Call the CSC or your TAMs for correct startup times to use in **ttchron.ini**.

**pMerge**

The CME Gateway installs with the **pmerge.exe** executable. During installation, this executable runs automatically to set up and configure the CME Group's product and tick tables that the TT Gateway requires. Additionally, when you upgrade a CME Gateway, **pmerge.exe** runs automatically to merge pre-existing product tables with any product tables distributed with the new TT Gateway software.

For instructions on using pMerge, refer to the section called **pMerge Overview** on page 49.

**Aconfig Time Zone Parameters**

You must pay close attention when configuring the time zone settings located in the **Aconfig.Core.Server.Exchange-Specific.Exchange-flavor.Time.Zone** directory. These settings directly impact price and fill server operation.

When resetting these parameters, you must restart both the Price and Fill Servers.



Failure to restart the Price and Fill Servers after changing the Aconfig time zone setting can result in missing fills.

#### Verifying Fill Server Rollover Settings

For the latest product rollover times, refer to: [http://www.cmegroup.com/trading\\_hours/index.html](http://www.cmegroup.com/trading_hours/index.html)

**Note:** When combining CBOT and CME channels on CME Gateway 7.15.0 or higher, you need to configure a single Fill Server rollover time for all products traded on the gateway.

To verify that the Fill Server Rollover occurs at the proper time, locate the following entry in the FillServer.log file:

**Example:** FillServer.log file

```
01.01.2008 15:25:00.671 | FILLSERVER/PROD | 3016 | INFO  
| 00000000 | Automatic rollover in 86400000 ms at: 2008/  
01/02 21:25:00 local time
```

Since the Fill Server is not running at 21:25:00 UTC, the Fill Server Rollover actually occurs at 15:25:00 Central Standard Time (UTC-6), when TTChron restarts the Fill Server.

**Note:** Because the CME Interest Rate and Currency products have not yet ended their trading session:

- Any fills received between 3:25pm and 4:00pm will be considered by the TT Fill Server as fills from the next day's session.
- If an X\_TRADER® is restarted between 3:25pm and 4:00pm, all of its fills received prior to 3:25pm will not be displayed.

If you wish to modify the rollover settings to occur after the close of CME Interest Rate and Currency products, please contact your local TAM.



## Dual NIC Machine

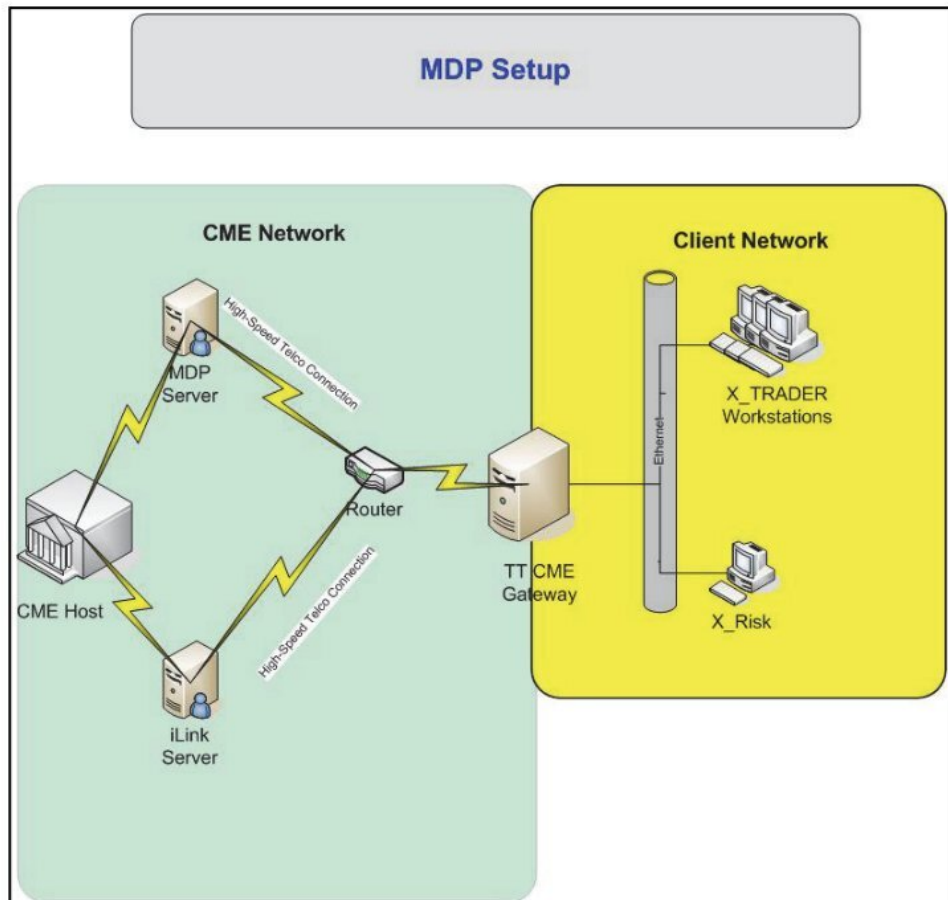
### Overview

For MDP connections, the CME Group recommends that you set up your TT Gateway on a dual-NIC machine with:

- One NIC facing the customer's local network
- One or more NICs facing CME Group's network that contains the MDP price distribution. For details on using multiple CME Group-facing NICs, refer to the section called **Configuring Multiple NIC Setup** on page 53.

The CME Group recommends that you do not place your CME Gateway behind a firewall. For an illustration of this setup, refer to the following diagram called MDP Setup.

### MDP Setup Diagram



## Configuring Multiple NIC Setup

### Overview

When connecting to the MDP platform, customers can set up their CME Gateway so that multiple NICs (two or more) face the CME Group's network. Using this physical setup, customers can then route MDP feeds over specific NIC IP addresses.

By default the **fast.cfg** file splits each channel into two feeds: A and B, which is ideal for two CME Group-facing NICs (one to support Feed A and the other to support Feed B). However, you must edit the file if you:

- Use more than two CME Group-facing NICs, and thus want to create more than two MDP feeds
- Want to maintain two feeds but name them something other than A and B.

#### ► To route MDP Feeds using multiple CME Group-Facing NICs:

1. Identify CME Group-facing NIC IP Addresses.
2. Create a unique label (e.g., A, B, C, D) for each NIC IP address.
3. Using Notepad, open **hostinfo.cfg** located in **<root drive>:\tt\config**.
4. In the **[price\_session]** section, on a unique line, configure **NetworkInterfaceFeed\*=IP**

Where:

- \* is the unique label you assigned the IP address. If you only use two CME Group-facing NICs, assign the first parameter A and the second parameter B.
  - IP is the IP address of the NIC through which you want to assign one or more MDP feeds
5. Repeat Step 4 for each CME Group-facing NIC.
  6. If you only use two NICs and use feed labels A and B, stop this procedure; otherwise, continue to the next step.
  7. If you have more than 2 CME Group-facing NICs, or want to use feed labels other than A and B, using Notepad, open the **fast.cfg** located in **<root drive>:\tt\config**.
  8. In each **[fastInterface]** section, edit the **AddressFeed\*** parameters to include the new feed labels that you created.

Including the feed label in parameter name routes that feed through the network interface assigned to that feed in Step 4.

### Example - Dual CME Group-Facing NICs Setup

To use two CME Group-facing NICs with the addresses 10.2.2.3 and 10.2.2.4, open **HostInfo.cfg** and configure the following two parameters in the **[price\_session]** section:

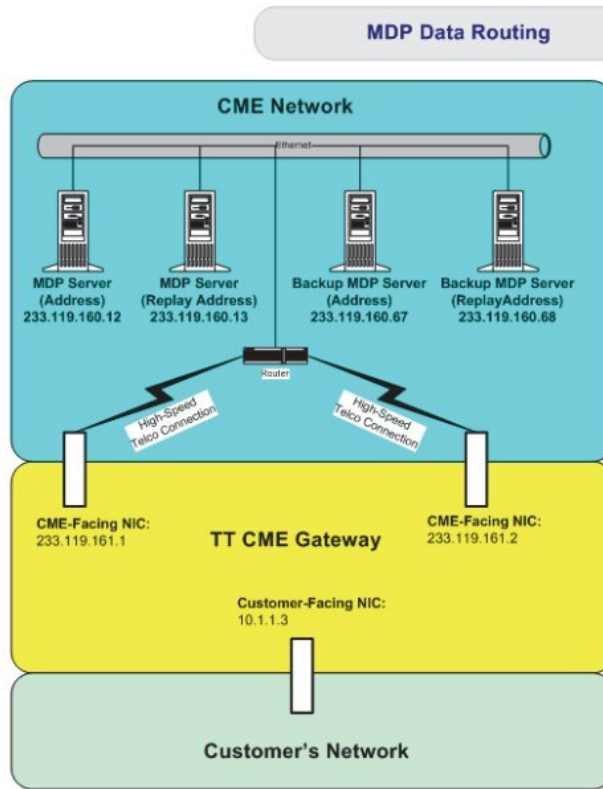
```
NetworkInterfaceFeedA=10.2.2.3
```

```
NetworkInterfaceFeedB=10.2.2.4
```

The TT Gateway routes through the NIC with IP address 10.2.2.3 all data received from IP addresses listed in **AddressFeedA** in **fast.cfg**. The TT Gateway routes through the NIC with IP address 10.2.2.4 all data received from IP addresses listed in **AddressFeedB** in **fast.cfg**.

### Diagram - Dual CME Group-Facing NICs

The following diagram illustrates a setup that includes two CME Group-facing NICs and how the TT Gateway routes data based upon the contents of **hostinfo.cfg** and **fast.cfg**.



HostInfo.cfg Settings:

The relevant parameters in HostInfo.cfg set the IP addresses of the two CME-facing NICs:

```
NetworkInterfaceFeedA=233.119.161.1
NetworkInterfaceFeedB=233.119.161.2
```

fast.cfg Settings:

The relevant parameters in fast.cfg categorize the primary MDP Servers as Feed A and the backup MDP Servers as Feed B:

```
AddressFeedA=233.119.160.12:10076
AddressFeedB=233.119.160.67:10076
```

The Customer-Facing NIC:

The TT Gateway sends all TT traffic over its customer-facing NIC. TTM automatically binds to this NIC when it is the primary. If you want to set a CME-facing NIC as primary, you must use Guardian to bind TTM to the Customer-facing NIC.

## Verifying Connectivity

<b>Overview</b>	<p>To complete the CME Gateway installation, CME Group may request that you pass several connectivity tests with CME Group's host machines. The customer must schedule specific dates and times with CME Group to perform these tests:</p> <ul style="list-style-type: none"> <li>• Ping and Telnet Tests</li> <li>• CME Group's Feed Tests</li> <li>• Price Server Startup Test</li> </ul> <p>You perform these tests after configuring the TT Gateway (e.g., with NT User information, product tables, etc.), but before starting TTChron (refer to <i>TT Gateway Architecture SAM Version 7.X</i>).</p> <p>Once you complete all tests with the CME Group, start TTChron. TTChron starts your Gateway as scheduled in <b>ttchron.ini</b>.</p> <hr/> <p><b>Note:</b> If this is a new membership (i.e., new TT customer), no one can trade through the TT Gateway until you successfully complete these tests.</p>
-----------------	--

<b>Ping Tests</b>	<p>You perform the ping and telnet tests to verify network connectivity to the CME Group host servers.</p> <p>To complete the ping and telnet tests, the customer must ping and telnet to the various IP addresses on CME Group's network that the CME Group distributes.</p> <p>The CME Group distributes the MDP and iLink IP addresses that you must ping (labeled <i>IPAddress</i> in the procedure below). The CME Group usually sends this information via E-mail to the customer. There are two types of IP addresses that you may need to test (each type usually consists of a pair of IP addresses):</p> <ul style="list-style-type: none"> <li>• MDP Replay Host</li> <li>• Host Server IP addresses: Host Server IP addresses are the IP addresses that you use in the order server sections ([<b>order_session_#</b>]) of the <b>hostinfo.cfg</b> file. These machines provide access to the trading host for order submission.</li> </ul> <p>A ping test fails if the command window states the request has timed out.</p> <p>▶ <b>To ping CME Group:</b></p> <ol style="list-style-type: none"> <li>1. Open a command window.</li> <li>2. Type: ping <i>IPAddress</i></li> <li>3. Type: ping <i>IPAddress</i></li> </ol> <p>▶ <b>To troubleshoot ping connectivity:</b></p> <ol style="list-style-type: none"> <li>1. If you are unable to ping any of the machines at CME Group, verify that the customer's network setup is correct. If the customer's network is correctly set up, call CME Group.</li> <li>2. If you can connect to one but not the other IP address, call CME Group. The problem is most likely on their end.</li> </ol>
-------------------	--



## Telnet Tests

CME Group distributes two order IP addresses and two price IP addresses, each set with its associated ports. TT recommends that you telnet these locations to test their status (respectively labeled IPAddress and Port in the procedure below). CME Group usually sends this information via E-mail to the customer.

### ► To telnet CME Group:

1. Open a command window.
2. Type: telnet *IPAddress Port*
3. Type: telnet *IPAddress Port*

The telnet test fails if you receive a **Connection Failed** prompt box.

#### Example:



## TT Listen Tool

The TT FAST Listen (named **tt\_fast\_listen.exe** and available in Version 7.5 and higher) tool listens to the price data that the CME Group sends. You use this tool to display the price data as plain text messages instead of **<opaque>**.

The tool exists in the **<root drive>:tt\Exchange-Flavor** directory.

Because the tool receives price data before the Price Server processes it, you can use it as a troubleshooting tool to compare actual price messages against what the Price Server broadcasts.

## CME Group Feed Tests

You must perform the CME Group Feed tests to verify the status of both CME Group's MDP feeds. You can perform these tests only during normal CME Group trading hours when the exchange is actively distributing price data. The CME Group delivers data via two MDP data channels named Feed A and Feed B. Failure to receive both feeds can result in excessive history requests and can cause price freezes.

You must pass both tests to maintain a proper connection to the exchange.

### ► To test FIX/FAST Feed:

1. Open a command window.
2. Type: **<root drive>:\tt\Exchange-Flavor**
3. Type the following exactly as indicated taking particular note on spacing:

```
tt_fast_listen -config <root drive>:\tt\ -template
<root drive>:\tt\config\FASTTemplates.xml
-address 224.0.26.5:10005 -interface IP
```

where **<root drive>** is the local drive letter and **IP** is the IP address of the TT Gateway that faces the exchange.

This tests the Feed A connection for the FX\_FUTURES channel. If the test succeeds, various messages appear in the command window. If you do not receive messages on either one of these channels, please contact the CME Group GCC.

---

#### Testing Price Server Setup

For best results, execute this test while the Price Server is running, and not outside of the default TTChron hours.

▶ **To start the Price Server:**

1. If TTChron is configured to shut down the Price Server during the time that you run this test, stop the TTChron service.

For this procedure, refer to the *TT Gateway Architecture SAM Version 7.X*.

2. From the **Start** menu, point to **Settings**, and then click **Control Panel**.
3. Double-click **Administrative Tools**.

The **Administrative Tools** window displays.

4. Double-click **Services**.

The **Services** window displays.

5. Scroll through the **Services** window to locate TT Price Server.

6. Right-click **CME Price Server**, and then click **Start**.

After about thirty seconds, the Price Server in Guardian should display as green.

▶ **To troubleshoot connection problems:**

1. Run the TT Listen tool to verify whether the connection is working.

2. Check the command window or:

- Make sure that the command is pointing to the correct file.
- If you see the text Connected followed by the text Disconnected, notify the CME Group. They will need to assist you in diagnosing the cause of this error.



## Understanding the Price Feed

<b>Price Server Files</b>	<p>During normal operation, the Price Server reads:</p> <ul style="list-style-type: none"> <li>• <b>Hostinfo.cfg</b> to determine the subjects (product data) to which it must subscribe.</li> <li>• <b>fast.cfg</b> to obtain each subject's connectivity information (i.e., channel number, IP addresses, ports, etc.)</li> </ul> <p>Also, at startup and after a product download, the Price Server reads the price data in <b>Exchange-flavor_Mode_ttqap.dat</b> to include previously traded contracts when calculating VAP for TTQAP-subscribed products.</p>
<b>TT Gateway Subscription Process</b>	<p>At startup and during operation, the Price Server reads the <b>hostinfo.cfg</b> file to determine:</p> <ul style="list-style-type: none"> <li>• The various subjects that it must download as specified by the <code>Subject#</code> parameters.</li> <li>• The NIC IP addresses (on the local machine) over which the TT CME Gateway routes the various MDP feeds. In the example above, these feeds are FeedA and FeedB (as illustrated in the <code>AddressFeed*</code> parameter). For details on routing MDP feeds, refer to the section called <b>Configuring Multiple NIC Setup</b> on page 41.</li> </ul> <p>After identifying these subjects, the Price Server refers to the <b>fast.cfg</b> file to determine the connectivity information on how to obtain the subject data from CME Group.</p>
<b>FIX/FAST Message Recovery</b>	<p>The TT CME Gateway order book is updated incrementally with market data per contract. If message recovery is necessary, the TT CME Gateway subscribes to snapshot channels to update the entire Order Book. Because the snapshot updates occur at a high message rate, subscribing to all snapshot channels simultaneously is not recommended. To help alleviate recovery issues, the Price Server is configured by default to do the following:</p> <ul style="list-style-type: none"> <li>• Use FIX/FAST incremental updates to refresh the Order Book.</li> <li>• Subscribe to the snapshot channels only when the incremental update has not refreshed the entire Order Book.</li> <li>• Dynamically subscribe to no more than two snapshot recovery channels at one time.</li> <li>• Only subscribe to snapshot channels for contracts with active price subscriptions. However, if an order is entered outside the displayed levels of depth for a contract that missed an inside market price update, the Price Server will not request a snapshot to refresh the Order Book. If an order is entered within the levels of depth, the snapshot is requested as needed.</li> </ul> <p>This FIX/FAST recovery behavior is defined by the <code>MaxSnapshotChannels</code> parameter in <b>hostinfo.cfg</b>. Because the parameter is not present in the <b>hostinfo.cfg</b> file by default, you'll have to manually add the <code>MaxSnapshotChannels</code> parameter if you want to reconfigure the number of snapshot channels to subscribe to. By default the Price Server functions as if the parameter is set to 2.</p>



---

**Note:** A value of "0" is allowed and indicates that the Price Server only uses incremental updates to refresh the Order Book (no snapshot channels are opened).

---

If a restart or mid-week startup is necessary, the TT CME Gateway is configured by default to do the following:

- Dynamically subscribe to no more than two instrument definition channels at one time.
- Perform incremental price updates to the Order Book only after instrument definition updates are complete.

This default TT CME Gateway behavior is defined by the `MaxInstrumentChannels` parameter in **hostinfo.cfg**. Because the parameter is not present in the **hostinfo.cfg** file by default, you'll have to manually add the `MaxInstrumentChannels` parameter if you want to configure the number of instrument definition channels to subscribe to. If you manually configure this parameter, the number of instrument definition channels should not exceed the number of price feed channels configured on the Price Server.

Refer to the section called **Section: [price\_session]** on page 120 for more details about these parameters.

---

**Note:** If there is missing price data for a product and a snapshot is requested, the Price Server clears the existing Order Book before refreshing it with the snapshot. This is by design and not the result of the client application (e.g., Autospreader<sup>®</sup>) deleting data from the Order Book prior to a snapshot. The occurrence of frequent snapshots may be an indication of capacity or performance issues within the network.

---



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#### Prices- FIX/FAST Messages

The TT CME Gateway continually receives market data snapshots from the exchange via FIX/FAST. If you subscribe to additional channels from the price feed, you must use the `-products` command line parameter to restart the Price Server and download the additional information.

For more information on FIX/FAST, refer to the section called **FIX/FAST Behavior** on page 64.

---

#### Price Server Data Flow

The following is a description of the price feed connection process from the Price Server to the exchange.

- The Price Server on the TT CME Gateway starts and reads **hostinfo.cfg** to determine which subjects to subscribe to.
- The Price Server reads **fast.cfg** to determine connectivity data for each of the subjects specified in **hostinfo.cfg**. The TT CME Gateway connects to the exchange via a UDP multicast, and subscribes to the products listed in **hostinfo.cfg**.
- The CME Group sends the requested price information to the Price Server. Every price message from the CME Group has a sequence number.

---

**Note:** Currently, the price sequence number starts at 1 on Sunday and increases by one for each price message received throughout the week. The sequence number resets back to 1 on Sunday.

---

- Each subject maintains its own sequence number.
- The Price Server begins broadcasting Market Depth and price updates using the multicast group as set in Guardian.
- In real time, the Price Server records the price structure for each contract held in RAM on the TT CME Gateway.

**Tick Tables, Point Values, and Product Tables**

The CME Group does not provide point values in their price feed.

**Verifying Product Table Settings**

You can use the override function in the product table to display the **Setup Product Table Items** dialog box and review these settings. For the TT CME Gateway, all items should be under Administrator control, and the **Setup Product Table Items** dialog box should appear as follows:



Customers with an MPF environment must ensure that all items are listed in the **Administrator** column for all MPF Price Servers and mapped Gateways.

► **To verify Guardian Product Table Settings:**

1. Open Guardian.
2. Click **File**, then click **Admin Login** from the drop down menu to login as an Administrator.
3. Click **Admin**, then click **Product Table Setup**.
4. In the **Exchange** list click the drop-down menu icon and select a TT CME Gateway.
5. Click **Override**.
6. In the **Setup Product Table Items** dialog box that is displayed, verify that no items are listed in the **Exchange** column.
7. Verify that the following items are listed in the **Administrator** column, and click **OK**:
  - Alias
  - Base Tick
  - Currency
  - Description
  - Margin
  - Point Value
  - Price Format
  - Round Lot
  - Tick Table
8. If any changes were made, click **Publish**.

**pMerge Overview**

The TT CME Gateway installs with the pmerge.exe executable. During installation, this executable runs automatically to set up and configure the product tables that the TT Gateway uses. Additionally, when you upgrade a TT CME Gateway,

**pmerge.exe** runs automatically to merge pre-existing product tables with any new product tables distributed with the latest TT Gateway software.

The only time you must use pMerge manually is if TT distributes updated product information in a customer advisory. TT distributes this product information in a file named **CME.pmg**.

**Note:** If you run **pmerge.exe** as part of receiving an updated **CME.pmg** from a Customer Advisory, TT recommends running it during non-trading hours; the Price Server has to be stopped and restarted in order to see the new product table changes.

You can run pMerge in two different ways:

- From Window Explorer
- From the Command Window

► **To run pMerge from Windows Explorer:**

1. In Windows Explorer, navigate to <root drive>:\tt\bin
2. Double-click **pMerge.exe**

The Open Guardian product table merge file dialog box appears.

3. Navigate to **<root drive>:\tt\config**
4. Double-click **CME.pmg**

pMerge creates the new product table. After pMerge completes its tasks, the pMerge status bar displays **Finished**.

5. Close the pMerge status bar.

► **To run pMerge in the Command Window:**

1. Open a Command Window.
2. At the command line prompt, run pMerge using the following syntax:

**Note:** pmerge [<root drive>:\tt\config\CME.pmg -e exchange-flavor [-q | -v]]

- **pmerge:** Runs the **pMerge.exe** file. If you do not include additional arguments, this command opens the Open Guardian product table merge file dialog box. Refer to the procedure called **To run pMerge from Windows Explorer:**.
- **-e exchange-flavor:** Sets the exchange-flavor of the TT Gateway whose product table pMerge updates.
- **-q:** Sets pMerge to run in quiet mode. pMerge does not output informative text in the Command Window when it runs.
- **-v:** Sets pMerge to run in verbose mode. pMerge outputs informative text in the Command Window when it runs.

pMerge creates the new product table. After pMerge completes its tasks, the pMerge status bar displays Finished.

3. Close the pMerge status bar.

---

**Support for Market Depth**

TT CME Gateways support implied depth, and forward all levels of aggregate depth available on the exchange's price feed.



## Configuring the Price Server Connection

### Firewalls and Connectivity

If a customer connects to the exchange through a firewall, you must ensure that the Primary port listed in the **hostinfo.cfg** file are available for one-way, outbound TCP sessions to the exchange host servers.

Additionally, if you NAT your TT CME Gateway through your firewall, you must use the IP address that the CME Group assigns as your NATed IP address. Resolve this address to your TT CME Gateway.



**Warning:** TT does not support or recommend using NAT IP addresses to connect to the CME Group. The CME Group holds you fully responsible for all maintenance regarding NAT IP addresses. You must consult the exchange for all NAT implementation details.

### Parameters

In the **hostinfo.cfg** file:

- Add price session connection information to and configure the [price\_session] section.
- For each Order Router (order session) you want to maintain, configure an [order\_session\_#] section.

For information on the **hostinfo.cfg** file, its sections, and their parameters, refer to Appendix A, [Configuration Parameters](#)

### Configuring HostInfo.cfg for an MDP Connection

#### ► To configure the hostinfo.cfg file for an MDP connection:

1. In Windows Explorer, navigate to **<root drive>:\tt\config**.
2. Using Notepad, open the **hostinfo.cfg** file.
3. Edit the [order\_session\_#] section.
  - Add order session connectivity information.
  - Set member and password information.
  - Configure CTI/Origin values.
4. Add and configure new order session sections as needed.
5. Configure the [price\_session] section with your custom connection parameters.
  - Configure all parameters that require custom values.
  - Add all product subscriptions that you need.
6. Add the exchange-facing NIC to the NetworkInterface parameter.

If you want to manage incoming feeds over multiple NICs, you must specify each network interface uniquely. For details on adding multiple interfaces, refer to the section called **Dual NIC Machine** on page 40.

7. On the File menu, click **Save**.
8. Close **hostinfo.cfg**.



## FIX/FAST Configuration

Introduction	TT CME Gateways provide CME Group's FIX/FAST support by default.
FIX/FAST Behavior	<p>To support FIX/FAST mode, the TT CME Gateway uses the following:</p> <ul style="list-style-type: none"> <li>• <b>Hostinfo.cfg</b> parameters: <ul style="list-style-type: none"> <li>- TemplateFile parameter: This parameter sets the location of the <b>FASTTemplates.xml</b> file.</li> <li>- Subject parameters: The TT CME Gateway uses FASTSubject parameters for FIX/FAST.</li> </ul> </li> <li>• <b>FASTTemplates.xml</b> file: The <b>FASTTemplates.xml</b> file serves as an encoder/decoder between the exchange and the TT CME Gateway.</li> <li>• <b>FAST.cfg</b> file: This configuration file contains connection information specific to product subscriptions.</li> </ul>
FASTTemplates.xml	<p>The <b>FASTTemplates.xml</b> file is an exchange-provided template file required to encode and decode the market data feed sent by the exchange. The file contains no user-configurable parameters. Any modifications to the contents of the file will result in incorrect parsing of the price feed.</p> <p>The file automatically installs with the TT CME Gateway and may need to be updated periodically. By default, this file is located in the <b>&lt;root drive&gt;:\tt\config</b> directory.</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p><b>Note:</b> To ensure that complete and accurate market data is being used on the TT CME Gateway, you must use the most recent version of the <b>FASTTemplates.xml</b> file. Failure to do so results in incorrect parsing of the price feed and ultimately bad prices.</p> </div> <p>TT provides the updated version of the file as follows:</p> <ul style="list-style-type: none"> <li>• Clean installation: Installing the latest version of the TT CME Gateway provides the most recent <b>FASTTemplates.xml</b> file by default.</li> <li>• Upgrade: When upgrading to the latest version of the gateway, the TT CME Gateway overwrites your existing <b>FASTTemplates.xml</b> file with the most recent version.</li> <li>• Customer Advisory: If the exchange updates the <b>FASTTemplates.xml</b> file prior to a TT CME Gateway release, TT will issue a Customer Advisory with the most recent version. You must manually overwrite your existing file with the most current file.</li> </ul>

### Checking the FASTTemplates.xml Version

#### ► To check if you are using the latest FASTTemplates.xml file

1. Navigate to **<drive letter>:\tt\config**
2. Using a text editor, open the **FASTTemplates.xml** file and record the Version and Template ID number listed in the "NEXT AVAILABLE TEMPLATE ID IS #" line.

```
<?xml version="1.0" encoding="UTF-8" ?>
- <templates xmlns="http://www.fixprotocol.org/ns/fast/td/1.1">
- <!--

*****
                VERSION: 2.0.0

                NEXT AVAILABLE TEMPLATE ID IS 108

*****

-->
- <!--
```

Templates for FIX/FAST versions prior to 2.0 do not list the version number in the file; only the Template ID number is listed.

3. Open the template on the TT Customer Portal and record the version numbers:
  - Login in to the Customer Portal at: <https://customernet.tradingtechnologies.com/extranet/portal.aspx>
  - Click **Products** and select **Downloads**
  - From the **Product Type:** drop-down menu, select **Miscellaneous** and click **Go**
  - Find "FASTTemplates.xml" in the **Miscellaneous** products table and click **Download** to display the latest template.
  - Record the Version and Template ID numbers listed in the "NEXT AVAILABLE TEMPLATE ID IS #" line.
4. Compare your version of the template with the one on the TT Customer Portal:
  - If the Version and Template ID numbers are the *same* in both files, you have the *latest* template.
  - If the Version or Template ID numbers are *different*, you need to *update* your **FASTTemplates.xml** file; download and save the template from the TT Customer Portal and apply it to the gateway.

### Applying the FASTTemplates.xml File

A new template file can be applied at anytime, but it is not processed until the next time you restart the Price Server.

#### ► To apply the FASTTemplates.xml file to the TT CME Gateway

1. Navigate to **<drive letter>:\tt\config**
2. Back up the existing **FASTTemplates.xml** file.
3. Locate the new **FASTTemplates.xml** file that you downloaded from the TT Customer Portal or received via Customer Advisory, and copy it into this directory.
4. If you are applying the new template *intra-week*, restart the Price Server after the trading session:
  - From the Windows **Control Panel**, double-click **Administrative Tools**.
  - Double-click **Services**.

- Scroll to the **CME Price Server**, click it, and click **Restart the service**.

#### FIX/FAST Message Recovery

The TT CME Gateway order book is updated incrementally with market data per contract. If message recovery is necessary, the TT CME Gateway subscribes to snapshot channels to update the entire Order Book. Because the snapshot updates occur at a high message rate, subscribing to all snapshot channels simultaneously is not recommended. To help alleviate recovery issues, the Price Server is configured by default to do the following:

- Use FIX/FAST incremental updates to refresh the Order Book.
- Subscribe to the snapshot channels only when the incremental update has not refreshed the entire Order Book.
- Dynamically subscribe to no more than two snapshot recovery channels at one time.
- Only subscribe to snapshot channels for contracts with active price subscriptions. However, if an order is entered outside the displayed levels of depth for a contract that missed an inside market price update, the Price Server will not request a snapshot to refresh the Order Book. If an order is entered within the levels of depth, the snapshot is requested as needed.

This FIX/FAST recovery behavior is defined by the `MaxSnapshotChannels` parameter in **hostinfo.cfg**. Because the parameter is not present in the **hostinfo.cfg** file by default, you'll have to manually add the `MaxSnapshotChannels` parameter if you want to reconfigure the number of snapshot channels to subscribe to. By default the Price Server functions as if the parameter is set to 2.

**Note:** A value of "0" is allowed and indicates that the Price Server only uses incremental updates to refresh the Order Book (no snapshot channels are opened).

If a restart or mid-week startup is necessary, the TT CME Gateway is configured by default to do the following:

- Dynamically subscribe to no more than two instrument definition channels at one time.
- Perform incremental price updates to the Order Book only after instrument definition updates are complete.

This default TT CME Gateway behavior is defined by the `MaxInstrumentChannels` parameter in **hostinfo.cfg**. Because the parameter is not present in the **hostinfo.cfg** file by default, you'll have to manually add the `MaxInstrumentChannels` parameter if you want to configure the number of instrument definition channels to subscribe to. If you manually configure this parameter, the number of instrument definition channels should not exceed the number of price feed channels configured on the Price Server.

Refer to the section called **Section: [price\_session]** on page 120 for more details about these parameters.

**Note:** If there is missing price data for a product and a snapshot is requested, the Price Server clears the existing Order Book before refreshing it with the snapshot. This is by design and not the result of the client application (e.g., Autospreader<sup>®</sup>) deleting data from the Order Book prior to a snapshot. The occurrence of frequent snapshots may be an indication of capacity or performance issues within the network.



**Emergency Order Book Reset**

If there's a failure on CME Group's MDP platform that could corrupt the market data on a particular channel, the exchange will initiate an Emergency Order Book Reset. During this event, the exchange clears and refreshes market data for all products on the impacted channel for both the incremental and snapshot recovery feeds.

In response to the reset, the TT CME Gateway Version 7.12.2 and higher clears the market data for all products on the impacted channel and processes the recovered, up-to-date data as it becomes available on the feed.

The following events occur during an Emergency Order Book Reset.

- The exchange sends a reset message down the incremental feed to the TT CME Gateway to indicate the market data on the channel is corrupted.
- The TT CME Gateway clears market data for all the products on the impacted channel and writes the following message to the Price Server log file:

**Example:** Price Server log message in response to Emergency Order Book Reset

```
31.03.2010 10:12:30.660 | PRICESERVER/PROD | 1232 | INFO | 00000000 |
price_session/FASTPriceBridge/FASTPriceBridge/CME_FAST_EQ_FUTURES |
Resetting All Order Books on the Channel.
```

- The exchange begins restoring market data for all products on the impacted channel.
- Once the market data for a product is restored, the exchange resumes sending incremental updates for that product.
- The TT CME Gateway processes the restored market data in real-time for each product on the channel, and writes the following message to the Price Server log file for each contract as it is reset:

**Example:** Price Server log message indicating a contract is reset

```
31.03.2010 10:12:30.660 | PRICESERVER/PROD | 1232 | INFO | 00000000 |
price_session/FASTPriceBridge/FASTPriceBridge/CME_FAST_EQ_FUTURES |
Resetting Contract Sequence Number To 1: EFEZ0
```

- Trading for the restored product can continue as normal while other products on the channel are going through the reset process.

**The fast.cfg File**

To assist with price data subscriptions, the TT CME Gateway uses the **fast.cfg** file.

**Note:** This additional configuration file aids in managing price data; however, it does not require manual updates. Do not edit this configuration file.

**Example: fast.cfg****Example:**



```
[fastInterface]
Subject=CME_EMINI_FUTURES
ChannelNumber=7
Version=0
AddressFeedA=224.0.26.1:10001
AddressFeedB=224.0.27.1:10001
InstrumentAddressFeedA=224.0.26.37:12001
InstrumentAddressFeedB=224.0.27.37:12001
SnapshotAddressFeedA=224.0.26.19:11001
SnapshotAddressFeedB=224.0.27.19:11001
Subject=CBOT_FAST_COMM_FUTURES
ChannelNumber=111
AddressFeedA=224.0.26.9:10016
AddressFeedB=224.0.27.9:10016
InstrumentAddressFeedA=224.0.26.45:12016
InstrumentAddressFeedA=224.0.27.45:12016
SnapshotAddressFeedA=224.0.26.27:11016
SnapshotAddressFeedb=224.0.27.27:11016
```

The **fast.cfg** is simply an index file that maps connectivity information to the various subjects that the CME Group broadcasts using FIX/FAST messages over the MDP feed. The **fast.cfg** file stores connection information for subject data in unique channel sections. By default, the TT CME Gateway does not automatically download all of the various feeds configured in the **fast.cfg** file. To download the feed for a particular subject, you must add a `Subject#=Subject` line to the `[price_session]` section in the **hostinfo.cfg** (for details on this parameter, refer to the section called **Section: [price\_session]** on page 120).

#### FASTInterface Parameters

By default the TT CME Gateway installs with a **fast.cfg** file configured to download all possible subject types from the CME Group. If the CME Group adds a new subject (i.e., set of product information) at a later time, TT will send out a Customer Advisory informing customers what changes they may need to make.

Parameter	Description
[fastInterface]	This is the section title. All sections in the <b>fast.cfg</b> file use this section title; there are no variables.
Subject=Subject	Sets the subject name of the data that the TT CME Gateway can request. To request this data, you must include a Subject parameter in the <code>[price_session]</code> section of the <b>hostinfo.cfg</b> with this subject as its value.
ChannelNumber=XXX	A variable number, starting at 1, that uniquely identifies the <code>[fastInterface]</code> section. The CME Group specifies this value.
Version=0	Allows the TT CME Gateway to support the version of FIX/FAST used on a given channel, which is specified by The CME Group. Refer to the section called <b>FIX/FAST Versions</b> on page 69.  This parameter is available in TT CME Gateway Version 7.12.2 and higher.

**Table 9. fast.cfg parameters**

Parameter	Description
AddressFeed*=IPAddress:Port	<p>This parameter sets the IP address and port that the CME Group uses to broadcast the subject data (as specified in the Subject parameter). For purposes of disaster recovery, each [fastInterface] section can contain multiple AddressFeed* parameters. The CME Group specifies these values.</p> <p>* is a wildcard and uniquely identifies a feed for the data that the specified IPAddress:Port distributes.</p>
	<p>Example:</p> <p>You include the line item AddressFeedA=233.119.16.12:10012</p> <p>This sets the TT Gateway to obtain subject data from IP Address 233.119.16.12 and port 10012. This feed is labeled FeedA for purposes of routing.</p>
InstrumentAddressFeedA	Sets the IP address and port that the CME Group uses to broadcast the instrument definition data.
SnapshotAddressFeedA	Sets the IP address and port that the CME Group uses to broadcast snapshots of market data activity.

Table 9. fast.cfg parameters

**FIX/FAST Versions**

The TT CME Gateway Version 7.12.2 and higher supports whichever version of FIX/FAST is used by the exchange for a given channel. At startup, the Price Server detects the version and logs the following message to the Price Server log:

**Example:** Gateway supporting FIX/FAST 2.0 on channel 7

```
28.03.2010 10:37:24.789 | PRICESERVER/SIM | 5600 | INFO | 00000000 |
price_session/FASTPriceBridge/FASTPriceBridge/CME_FAST_EQ_FUTURES | FAST
INFO: CME_FAST_EQ_FUTURES: 224.0.25.6:10001: Auto-Sensing: VERSION TWO
```

If the TT CME Gateway detects FIX/FAST Version 1.0 for a particular channel, then Auto-Sensing: VERSION ONE is written in the log message.

## Configuring Product Subscriptions

<b>Overview</b>	Product subscriptions are configured on the TT CME Gateway by enabling subjects (product data) in the <b>hostinfo.cfg</b> file. The FIX/FAST channel and connectivity information for each product is defined in <b>fast.cfg</b> , which is not configurable. This section describes how to enable subjects and provides guidelines for optimizing gateway performance when configuring product subscriptions.
<b>Parameters</b>	The <code>FASTSubject</code> parameters in the <code>[price_session]</code> section of <b>hostinfo.cfg</b> are used for subscribing to FIX/FAST channels.

### Example:

```

FASTSubject1=CME_FAST_FX_FUTURES
FASTSubject2=CME_FAST_FX_OPTIONS
FASTSubject3=CME_EMINI_FUTURES
FASTSubject4=CME_EMINI_OPTIONS
FASTSubject5=CME_FAST_IR_FUTURES
FASTSubject6=CME_FAST_IR_OPTIONS
FASTSubject7=CME_FAST_OT_FUTURES
FASTSubject8=CME_FAST_OT_OPTIONS
#FASTSubject9=NYMEX_FAST_OIL_GASOLINE_IPORT
#FASTSubject10=NYMEX_FAST_NATURALGAS_PROPANE
#FASTSubject11=NYMEX_METALS_SOFTS_FUTURES
#FASTSubject12=NYMEX_FAST_CRUDE_OPTIONS
#FASTSubject13=NYMEX_FAST_NONCRUDE_ENERGY_OPTIONS
#FASTSubject15=BMF_FUTURES
#FASTSubject16=BMF_OPTIONS
#FASTSubject17=DME_FUTURES
#FASTSubject18=INTER_EXCHANGE_SPREADS
#FASTSubject19=CME_EQ_FUTURES
#FASTSubject20=CME_EQ_OPTIONS
#FASTSubject21=COMEX_FUTURES
#FASTSubject22=COMEX_OPTIONS
#FASTSubject23=BMD_FUTURES
#FASTSubject24=BMD_OPTIONS
#FASTSubject26=CME_FX2_FUTURES
#FASTSubject27=CME_FX2_OPTIONS
#FASTSubject28=CBOT_FAST_COMM_FUTURES
#FASTSubject29=CBOT_FAST_COMM_OPTIONS
#FASTSubject30=CBOT_FAST_EQ_FUTURES
#FASTSubject31=CBOT_FAST_EQ_OPTIONS
#FASTSubject32=CBOT_FAST_IR_FUTURES
#FASTSubject33=CBOT_FAST_IR_OPTIONS
#FASTSubject34=MGEX_FAST_FUTURES
#FASTSubject35=MGEX_FAST_OPTIONS
#FASTSubject36=KCBT_FAST_FUTURES
#FASTSubject37=KCBT_FAST_OPTIONS
#FASTSubject38=GREEN_EXCHANGE_FUTURES
#FASTSubject39=GREEN_EXCHANGE_OPTIONS
#FASTSubject40=DME_OPTIONS

```

For more information about the sections and parameters in **hostinfo.cfg**, refer to Appendix A, [Configuration Parameters](#).

### Recommendations for Optimal Performance

#### Channel Limits

For TT CME Gateway Version 7.12.3 or higher, the Price Server allows subscription to any combination of channels as long as the limit of 14 FIX/FAST channels is not exceeded. This limit also applies to MPF Price Servers in an MPF2 environment.



**Note:** As a reminder, the channel limit is in place to ensure Gateway performance. Internal testing at TT has shown that, for extremely performance-sensitive customers, the number of channels enabled on the TT CME Gateway should be kept well below the 14 channel maximum. Please work with your local TAM to determine the optimal configuration based on your trading style and volume.

### Channel Volume

When optimizing Gateway performance, the level of activity on each channel also needs to be considered. Currently, the following channels experience the most volume, so TT strongly recommends not combining these channels on a single gateway:

- Channel 9: CME Globex Interest Rate Futures (\*\_IR\_FUTURES)
- Channel 30: NYMEX Crude Futures (\*\_OIL\_GASOLINE\_IPORT)

**Note:** The recommendations in this section are based on testing results and historical subscription data. Please work with your local TAM to determine the optimal configuration based on your trading style and volume.

### Enabling Subjects in HostInfo.cfg



**Warning:** If the TT CME Gateway subscribes to more than 14 FIX/FAST channels, the Price Server logs an error message and displays as Exchange Feed Down (half red, half green) in Guardian. If this occurs, you will need to adjust the number of subject parameters enabled in the [price\_session] section in **hostinfo.cfg** and restart the Price Server.

A sample error message is shown in the following example (where "Y" equals the number of channels currently enabled on the TT CME Gateway):

#### Example:

```
| INFO | 00000000 | price_session | Price Server Shutting Down:
| INFO | 00000000 | price_session | For performance concerns the Price
Server cannot load more than 14 channels.
| INFO | 00000000 | price_session | Y channels were enabled in
hostinfo.cfg.
```

### ► To enable subjects in the hostinfo.cfg file

1. In Windows Explorer, navigate to **<root drive>:\tt\config**.
2. Using Notepad, open the **hostinfo.cfg** file.
3. In the [price\_session] section, enable or add each FASTSubject parameter:
  - To subscribe to a FIX/FAST channel, remove the # sign from in front of the corresponding FASTSubject parameter.
  - When adding a FASTSubject parameter, the parameter number *must* be incremented by "1" (e.g., if the last FASTSubject parameter is FASTSubject17=<Subject>, you should add the next line as FASTSubject18=<Subject>).
  - Ensure each parameter is on its own line in the [price\_session] section
  - Review the updated FASTSubject list and ensure that the value of '#' in each FASTSubject#= parameter is sequential and does not contain a duplicate number.
4. On the File menu, click **Save**.



5. Close **hostinfo.cfg**.

## Configuring Total Traded Quantity at Price (VAP)

### Overview

To accurately convey market data sent from the exchange, you can configure how the TT CME Gateway calculates the following:

- Total Traded Quantity at Price (TTQAP) or Volume at Price (VAP)
- Total Traded Quantity (TTQ)
- Last Traded Quantity (LTQ)
- Last Traded Price (LTP)

By configuring both the `IncludeSpreadTrades` and the `IncludeSpreadTradesInVap` parameters in the `[price_session]` section of **hostinfo.cfg**, you can set the TT Gateway to calculate VAP similar to previous versions, according to the current version's default or a mixture of the two. By default, these parameters are not present, and the Gateway behaves as described in the first row of the following table.



Using approaches other than the current default will cause LTQ, LTP, and TTQAP to update unexpectedly. This will have negative effects on tools (i.e. Autospreader<sup>®</sup>, etc.) that use these values to trigger an event because the updates may be away from the inside market when the updates occur.

**Approaches to TTQAP**

The following table shows the possible configurations and their effect on the TT CME Gateway:

IncludeSpreadTradesInVap Setting	IncludeSpreadTrades Setting	Gateway Behavior
Y	N	<p>The Gateway exhibits the following behaviors:</p> <ul style="list-style-type: none"> <li>• VAP: Always updates and includes spread trades. VAP exactly matches TTQ.</li> <li>• LTQ and LTP: Does not include spread trades. This provides a more accurate picture of actual market activity.</li> </ul> <p>This is the current default behavior.</p>
Y	Y	<p>The Gateway exhibits the following behaviors:</p> <ul style="list-style-type: none"> <li>• VAP: Always updates and includes spread trades. VAP exactly matches TTQ.</li> <li>• LTQ and LTP: Always updates even when a spread trade occurs. This can cause LTQ and LTP to equal values away from the inside market.</li> </ul> <p>This is the default behavior for previous versions of the Gateway.</p>
N	N	<p>The Gateway exhibits the following behaviors:</p> <ul style="list-style-type: none"> <li>• VAP: Updates only for legs and not for spreads. VAP on legs does not equal TTQ.</li> <li>• LTQ and LTP: Does not include spread trades. This provides a more accurate picture of actual market activity.</li> </ul>
N	Y	<p>The Gateway exhibits the following behaviors:</p> <ul style="list-style-type: none"> <li>• VAP: Updates only for legs and not for spreads. VAP on legs does not equal TTQ.</li> <li>• LTQ and LTP: Always updates even when a spread trade occurs. This can cause LTQ and LTP to equal values away from the inside market.</li> </ul>

**Table 10. Approaches to TTQAP**

## Configuring Product Group Subscriptions

### Productgroupings.cfg Overview

This file contains a listing of products available for subscription via the `productgroupingfilter` parameter. When using this parameter, the products listed must follow the format set in the **productgroupings.cfg** file.

For example, if you want to trade Eurodollar Options, you must:

- Add the `productgroupingfilter` and `enableordisablegroupings` parameters to the **hostinfo.cfg** file.
- Set `productgroupingfilter=EUODLRFUT, EURODLROPT`
- Set `enableordisablegroupings=enable`
- Ensure that the FIX/FAST price feed channels for the products listed in **productgroupings.cfg** are enabled in the `[price_session]` section of the **hostinfo.cfg** file.
- Add the **productgroupings.cfg** file to the `<root drive>:\tt\config` directory.

**Note:** TT recommends configuring a separate gateway for all Eurodollar contracts. When using this approach, set up a secondary gateway to trade Eurodollar contracts by completing the steps above. Repeat this procedure on the primary TT CME Gateway; however, you must set `enableordisablegroupings=disable` on that gateway.

### Productgroupings.cfg Example

#### Example:

```
[productgrouping_EUODLRFUT]
GE
GE0
GE2
GE5

[productgrouping_EURODLROPT]
E0
E2
E5
E$
```



## Support for User-Defined Strategies

<b>Introduction</b>	In addition to exchange-defined strategies, the TT CME Gateway supports creating a User-Defined Strategy (UDS) using the client trading application.
<b>Strategy Types</b>	<p>The TT CME Gateway supports creating two basic UDS types: Covered and Combo.</p> <ul style="list-style-type: none"> <li>• <b>Covered:</b> A strategy where options and futures are traded as a spread. These strategies require a futures contract price and delta. The legs of the spread also can be spreads or exchange-defined and user-defined strategies.</li> <li>• <b>Combo:</b> Any options spread where the legs are a combination of outright options, exchange-defined options strategies, or listed user-defined options strategies.</li> </ul>
<b>Enabling UDS Support</b>	<p>To enable this functionality on the TT CME Gateway, you must ensure the following:</p> <ul style="list-style-type: none"> <li>• To create and trade a User-Defined Strategy, you must upgrade to X_TRADER® 7.6 or higher. To trade user-defined strategies, you need X_TRADER® 7.5.2 or higher.</li> <li>• Verify that the client application receives price updates for the outrights.</li> <li>• Verify that <code>OptionStrategies=Y</code> in the <b>hostinfo.cfg</b> file.</li> <li>• Determine the setting for the <code>ProcessCoveredUDS</code> parameter in the <code>[price_session]</code> section of <b>hostinfo.cfg</b>: <ul style="list-style-type: none"> <li>- ALL: Allows the price server to download all Covered UDS security definitions from the exchange. A Covered UDS contract with multiple Futures legs will <i>not</i> be accurately risk checked by the client trading applications in your environment. Refer to the section called <a href="#">Client Application Impact</a> for more information.</li> <li>- SINGLE: Configures the price server to download and process definitions only for Covered strategies with one outright Futures leg. This is the default TT CME Gateway behavior.</li> <li>- NONE: Configures the price server to disregard all Covered UDS security definitions.</li> </ul> </li> <li>• Enable or disable logging of UDS creation and download messages using the <code>LogUDSCreation</code> parameter in <b>hostinfo.cfg</b>: <ul style="list-style-type: none"> <li>- Y: Enables logging of UDS Created and UDS Received messages.</li> <li>- N: Disables logging of UDS Created and UDS Received messages.</li> </ul> </li> </ul>
<p><b>Note:</b> User-Defined Strategies are supported in FIX/FAST mode only. To subscribe to a channel in the fast.cfg file, verify that each line for the instrument you wish to trade is uncommented (i.e., remove the # symbol if present).</p>	
<b>Interpreting the Audit Trail</b>	<p>The <b>Audit Trail</b> may display the following messages during Covered or Combo strategy creation:</p> <ul style="list-style-type: none"> <li>• <code>Sent request to create series: X_TRADER®</code> forwarded the strategy to the TT Gateway.</li> <li>• <code>Sending COVERED strategy creation request to globex:</code> The TT Gateway</li> </ul>

forwarded the Covered strategy request to the exchange.

- `Sending COMBO strategy creation request to globex: The TT Gateway forwarded the Combo strategy request to the exchange.`
- `Successfully created UD:US:CFO: Indicates that the exchange accepted the creation request. The exchange's ten-digit identification code appears at the end of the Successfully created message. However, the actual strategy is not available to work in the market until the UDS instrument is created by the price server.`
- `Create Spread Series ended: Displays when the process completes. If this occurs before a Successfully created message appears, then the strategy creation timed out and the exchange did not provide any additional information.`
- `Strategy Creation Rejected - Unsupported Strategy Type <Requested Type> - Globex Gateways only support the creation of Combo and Covered Strategies: Indicates the Order Server rejected an unsupported strategy type entered by the client trading application.`
- `Can't send covered creation request with invalid price delta x.xx Acceptable price delta range [0.01-1.00{40.00}]: Displays when an invalid delta value is entered for a futures leg covering an option outright or spread/strategy.`

#### Data Flow for Creating a UDS

The following is a sample data flow for creating a Covered or Combo UDS using X\_TRADER®:

- For a Covered UDS creation request, X\_TRADER® sends a **Strategy Type** of `Covered` and the price and delta entered for each Futures leg to the Order Server. The Order Server uses the GAL setting defined for a delta (`AConfig.Core.Server.Exchange-Specific.CME.GAL.Vol-Qty-Ratio-Denom`) in `aconfig_local.xml` to treat the delta as a percentage quantity of the Futures leg before checking it for validity. A message for the request is logged in the Audit Trail.
- For a Combo UDS creation request, X\_TRADER® sends a **Strategy Type** of `Combo` to the Order Server. A message for the request is logged in the Audit Trail.
- For each leg of the strategy, the Order Server obtains the Instrument Group Code and Complete Instrument Code from the FIX/FAST security definition messages, and includes them in the UDS request sent to the exchange.
- For a Combo or Covered UDS the Order Server validates the request and forwards it to the exchange, then sends a message to X\_TRADER® indicating the request has been sent. If the Order Server denies the request, it logs a failure message in the Audit Trail in X\_TRADER® explaining the reason for the rejection.
- The exchange accepts or rejects the UDS creation request and sends the corresponding message to the Order Server. Some examples of why the exchange rejects a request are:
  - The strategy already exists.
  - The content or format of the creation request message was incorrect.
  - The underlying products are not available for trading, or the market is closed.
- The Order Server logs a message in the Audit Trail in X\_TRADER® indicating whether the Combo or Covered strategy was accepted or rejected by the exchange.

- If accepted, the exchange multicasts the security definitions for the created Combo or Covered strategy to the Price Server.
- The Price Server creates the Combo or Covered UDS contract and makes it available for trading and quoting.

---

**UDS Supported Order Types**

The following order types are supported for Covered and Combo UDS instruments:

- Limit
- Market-Limit

The CME Group supports the following order qualifiers for a Combo UDS:

- GTD
- GTC
- FAK

---

**Client Application Impact**

In addition to the risk limits you can establish in Guardian, P&L calculations and risk management for trading UDS contracts are supported by the following minimum versions of these TT clients:

- X\_TRADER® 7.6
- X\_RISK® 7.3.2
- X\_STUDY™ 7.2
- FMDS
- TT USER SETUP 7.0.3

Covered User-Defined Strategies can be created and made available for trading if you decide to do so. Setting the `ProcessCoveredUDS` parameter to `ALL` in the **hostinfo.cfg** file will download all Covered UDS security definitions, including Covered User-Defined Strategies with multiple Futures legs. However, the client trading applications in your trading environment will not correctly calculate risk for the multiple Futures legs of the Covered UDS. Refer to the following example.

**Example:** A Covered UDS defined with multiple futures legs

```
Created as...
+1x6E Nov09 C11100:-.5x6E Dec09:+.5x6E Nov09

Will be incorrectly risk checked as...
+1x6E Nov09 C11100:-.5x6E Dec09:+50x6E Nov 09
```

This example illustrates that risk calculations for one of the Futures legs will be incorrectly multiplied by a factor of 100, causing traders to surpass their risk limits.



## Number of Orders at Price

<b>Overview</b>	TT CME Gateways 7.16 and higher display the number of orders that make up the bid/ask quantity at a given price. Traders and brokers find this useful in determining if there is a market at certain price levels for a particular product, or in identifying when large-sized orders have been entered in the market.
<b>TT Gateway Support</b>	<p>To support this functionality for traders, the TT CME Gateway obtains the number of orders at each level of aggregate depth (direct or implied) provided by the exchange and sends it to the client trading applications. Changes in quantity are also obtained from the price feed and sent by the gateway to the clients.</p> <p>The TT CME Gateway supports up to 20 levels of aggregate depth per side. The exchange sends up to 10 levels, which varies per product. The number of orders is only provided by the exchange for Limit orders and not resting Market orders. Detailed depth is not provided by the exchange, so the number of orders are displayed only at the aggregated price level in X_TRADER®.</p>
<b>TT Client Impact</b>	<p>The following are the minimum versions of TT Clients required to support the Number of Orders functionality:</p> <ul style="list-style-type: none"> <li>• X_TRADER® 7.11.2</li> <li>• FIX Adapter 7.7.5</li> <li>• X_TRADER® API 7.7.4</li> </ul> <p>X_TRADER® 7.11.2 or higher displays the Number of Orders columns per side in MD Trader, or shows the number of orders in the <b>BidCnt</b> and <b>AskCnt</b> columns in the Market Window.</p> <p>In MD Trader, users can view the number of orders that comprise the total bid or ask quantity for up to 20 price levels from the inside market. If the number of orders at a price level is truncated due to exchange size limitations, the TT CME Gateway indicates this by appending a "+" to the value sent to X_TRADER®.</p> <p>Refer to the X_TRADER® Help system and User Manual for more details.</p>



## Support for BM&FBOVESPA Products

<b>Overview</b>	TT CME Gateway Version 7.5.6 and higher supports trading of BM&FBOVESPA (Brazilian Mercantile & Futures Exchange Bovespa) Futures and Options products via the CME Globex electronic trading platform.
<b>Available Products</b>	Traders can trade futures and options contracts for all agricultural commodity, financial contract, and OTC market products available at the BM&FBOVESPA exchange. CME Group exchange customers must comply with and meet the registration requirements of BM&FBOVESPA. For a complete list of products, refer to the <a href="#">BM&amp;FBOVESPA</a> exchange web site.
<b>TT CME Gateway Configuration</b>	Trading is supported on the TT CME Gateway by enabling the price feed channels for BM&FBOVESPA subjects in the [price_session] section of the <b>hostinfo.cfg</b> file. To enable a channel, remove the # character to "uncomment" the corresponding FIX/FAST subject parameter.

**Note:** The CME Exchange multicasts market data for BM&F BOVESPA products using FIX/FAST mode only.

The FIX/FAST subject parameters for BM&FBOVESPA are included in a clean install of the **hostinfo.cfg** file. However, after an upgrade, you will have to manually update the **hostinfo.cfg** file with the BM&FBOVESPA parameters from the master file. For more information about updating a **hostinfo.cfg** file from the master file, refer to the section called **Master Files** on page 33. The parameters for BM&FBOVESPA are shown in the following example.

**Example:**

```
FASTSubject16=BMF_FUTURES
FASTSubject17=BMF_OPTIONS
```

Because there is a 14 channel limit on the TT CME Gateway Version 7.12.3 or higher, ensure that the TT CME Gateway used for trading BM&FBOVESPA products has enough capacity to add the two additional channels.

In the **fast.cfg** file, the price feed channels for the two BM&FBOVESPA product types are defined as follows: channel 24 for Futures and channel 25 for Options.

The channel definitions are provided by CME Group and included in the **fast.cfg** file installed on the TT CME Gateway. For more information regarding how the TT CME Gateway uses the **fast.cfg** file, refer to the section called **Example: fast.cfg** on page 67.

<b>Client Application Impact</b>	<p>X_TRADER<sup>®</sup> 7.4.9 or higher is required for trading BM&amp;FBOVESPA products. Contracts are traded in Brazilian currency, so you need to add the exchange rate between the Brazilian Real and the US Dollar (USD) to the currency table in Guardian. For procedures to update the currency table, refer to the <i>Guardian 7.x Online Help</i>.</p> <p>BM&amp;FBOVESPA products are not eligible for the following exchange features:</p> <ul style="list-style-type: none"> <li>• Cancel on Disconnect (COD)</li> <li>• Mass Quotes</li> <li>• User Defined Strategies (UDS)</li> <li>• Request for Cross (RFC)</li> <li>• Request for Quote (RFQ)</li> <li>• Privately Negotiated Trades (PNT)</li> <li>• Spreads (prelisted multi-leg strategies): For any listed contract that represents multiple instruments, instrument details will not be disseminated.</li> <li>• Implied Trading</li> <li>• Good Till Cancel (GTC) orders</li> <li>• Good Til Date (GTDate) orders</li> </ul>
<b>BM&amp;FBOVESPA Supported Order Types</b>	<p>The TT CME Gateway supports the following order types for all BM&amp;FBOVESPA Futures and Options products:</p> <ul style="list-style-type: none"> <li>• Limit</li> <li>• Stop-Limit</li> <li>• Market-Limit</li> <li>• FAK</li> </ul>
<b>BM&amp;FBOVESPA Unsupported Order Types</b>	<p>The exchange does not support the following order types available via CME Globex:</p> <ul style="list-style-type: none"> <li>• Market Order with Protection</li> <li>• Stop Order with Protection</li> </ul>
<b>Point Values for BM&amp;FBOVESPA Products</b>	<p>You need to confirm the correct point value in the TT-Supported Product Database and manually update the Guardian product table, as needed. To confirm the correct point value for a product, refer to:</p> <p><a href="http://www.tradingtechnologies.com/productdb/">http://www.tradingtechnologies.com/productdb/</a></p> <p>Some BM&amp;FBOVESPA products will not have working point values defined in the product table. Instead, the following products have their point values set using an exchange-defined formula that changes on a tick-to-tick or day-to-day basis:</p> <ul style="list-style-type: none"> <li>• DAP</li> <li>• DDI</li> <li>• DDM</li> </ul>

- DI1
- FRC
- FRM
- FRP
- SCC

## Support For NYMEX Variable Quantity Energy Products

---

**Overview** TT CME Gateway versions 7.5.11 and higher support trading of New York Metals Exchange (NYMEX) Variable Quantity Energy products.

---

**Available Products** The TT CME Gateway supports trading of futures, calendar spreads, and futures strips for the following NYMEX Variable Quantity Energy products:

- Henry Hub Swap (NN)
- PJM Western Hub Peak Calendar-Month Real-Time LMP (L1)
- PJM Western Hub Peak Calendar-Month Real-Time LMP 50Mwh (4SN)
- Houston Ship Channel Basis Swap (NHN)
- Northwest Pipeline, Rockies Basis Swap (NR)
- Waha, Texas Basis Swap (NW)
- Texas Eastern Zone M-3 Basis Swap (NX)
- Natural Gas Pipeline TexOK Basis Swap (PD)
- Panhandle Basis Swap (PH)
- TCO Basis Swap (TC)
- Columbia Gulf Onshore Basis Swap (GL)
- NGPL Midcontinent Basis Swap (NL)
- Northern Natural Gas Demarcation Basis Swap (PE)
- Ventura Basis Swap (PF)

---

**Client Application Impact** X\_TRADER® 7.5.2 or higher is required for trading NYMEX Variable Quantity products. X\_TRADER® displays quantities for fills as the individual tradeable contract regardless of whether the Show quantity as option equals contracts or flow. This option is set using the Trading tab in the Properties menu.

**Note:** In the Market Explorer window, the outright contracts for NYMEX Variable Quantity products list under Energy while the corresponding spreads list under Spread.

The Price Server stores Lots and Delivery Unit values parsed from the security definitions for NYMEX futures downloaded from the exchange. These values, along with the calculated Blocks value, aid the TT CME Gateway in determining the contract size for each NYMEX energy product.

Using the product definitions from the price feed, the TT CME Gateway calculates Blocks as the number of delivery periods for a product. The Lots value is essentially the number of delivery days in a contract, and the Delivery Unit value is what is displayed in X\_TRADER® when trading futures contracts in flow.

Position Limits for all energy contracts should be entered in Lots instead of Contracts. Risk administrators should enter both the Maximum Order Quantity and Maximum Position limits in Lots. For more information about risk checking of Energy Products, please refer to the *TT User Login and Risk Administration Reference Guide*.



X\_RISK, X\_STUDY, and FMDS determine P&L and risk based on the calculated total value of the variable quantity futures contract. To calculate the contract value, the client applications multiply Lots \* Delivery Unit \* Guardian Point Value.

**Example:** The total value of one March 2009 Henry Hub Natural Gas Swap Futures contract:  
 Lots (delivery days in the month) \* Delivery Unit when trading in flow \*  
 Point Value calculated by the TT CME Gateway  
 $31 * 2500 * .001 = 155$

The following table defines the values used for calculating NYMEX contract value.

Price Server Field	Definition
Lots	The number of delivery days in a contract.
Blocks	The number of delivery periods in a contract. Calculated by the TT CME Gateway as the number of delivery days (Lots) multiplied by the number of units delivered per day. To determine units per day, the TT CME Gateway divides the exchange-defined contract value by the minimum, incremental quantity per product (Delivery Unit). The units per day value also is used to calculate the point value for the product.
Delivery Unit	The minimum, incremental quantity per energy product. For example, 2500 MMBTU for gas or 25 MWH for electricity.

**Table 11. Additional Price Data Stored for NYMEX Variable Quantity Products**

#### Product Tables, Point Values and Tick Tables

The TT CME Gateway calculates the point value for a variable quantity product by using the following values parsed from the price feed: Exchange-defined contract value, minimum quantity traded per product (Delivery Unit), and a Display Conversion Factor.

**Example:** To calculate the point value for PJM Western Hub Peak Calendar-Month Real-Time LMP 50 MWH (4SN):  
 Exchange-defined contract value / Delivery Unit when trading in flow \*  
 the Display Conversion Factor  
 $800/50 \text{ MWH} * 0.01 = .16$

The point value for all variable quantity spread contracts is set to the point value of the first leg of the spread.

#### Configuring NYMEX Product Support

After a clean install or upgrade to version 7.5.11 or higher, the TT CME Gateway is configured to support trading of NYMEX Variable Quantity products.

#### NYMEX Supported Order Types

The following list shows Market and Limit orders a trader can submit through the TT CME Gateway when trading NYMEX Variable Quantity products; the exchange natively supports these order types:

- IOC
- FOK
- GTD
- Stop
- GTC
- GTDate
- Iceberg

## Support For DME Products

---

**TT Gateway Version** TT CME Gateway 7.14.x and higher supports trading of Dubai Mercantile Exchange (DME) energy products. To trade options on DME energy products, you need TT CME Gateway 7.15.1 or higher.

---

**Available Products** You can trade futures, options, futures strips, calendar spreads, and inter-commodity spreads for the following DME energy products:

- Oman Crude Oil
- Oman Crude Oil Financial

---

**Client Application Impact** X\_TRADER® 7.4.9 or higher is required for trading DME energy products.

---

**Note:** In the **Market Explorer** window, the outright contracts for DME products list under **Future** while the corresponding spreads list under **Spread**.

---

**Configuring DME Product Support** Trading is supported on the TT CME Gateway by enabling the price feed channels for DME products in the [price\_session] section of the **hostinfo.cfg** file. To enable a price feed channel, remove the # sign to “uncomment” the corresponding FIX/FAST subject parameter.

For TT CME Gateway 7.15.0, you will have to manually update **hostinfo.cfg** with the DME parameters provided by TT. The parameters for DME products are shown in the following example.

**Example:**

```
FASTSubject18=DME_FUTURES
FASTSubject40=DME_OPTIONS
```

Because there is a 14 channel limit on the TT CME Gateway, ensure that the TT CME Gateway used for trading DME products has enough capacity to add the additional channel. Refer to the section called **Recommendations for Optimal Performance** on page 70.

The channel definitions are provided by CME Group and included in the **fast.cfg** file provided by TT. For more information regarding how the TT CME Gateway uses the fast.cfg file, refer to the section called **Example: fast.cfg** on page 67.

## Support For Inter-Exchange Spread Products

<b>Overview</b>	<p>The TT CME Gateway supports trading of inter-exchange spread (IES) products. Inter-exchange spreads are implied futures spreads with two legs that originate from different exchanges. They consist of buying the front leg (exchange A) and selling the back leg (exchange B), with both legs having the same maturity.</p> <p>Traders must be authorized to trade the products of both exchanges (e.g., NYMEX &amp; DME) in order to trade the inter-exchange spread.</p>
-----------------	--

**Available Products** There are four IES products available for trading via the TT CME Gateway:

Contract	Front Leg (NYMEX)	Back Leg (DME)	Product Code
Brent / Oman Financial Crude Spread	Brent Crude Oil	Oman Financial Crude Oil	BZF1-ZGDF1
Sweet / Oman Financial Crude Spread	Light Sweet Crude Oil	Oman Financial Crude Oil	CLF1-ZGDF1
Brent / Oman Crude Spread	Brent Crude Oil	Oman Crude Oil	BZF1-OQDF1
Sweet / Oman Crude Spread	Light Sweet Crude Oil	Oman Crude Oil	CLF1-OQDF1

**Table 12. NYMEX-DME Inter-Exchange Spread Products**

**Client Application Impact** X\_TRADER® 7.4.9 or higher supports trading of NYMEX and DME products, and supports trading of the inter-exchange spread crude oil contracts.

**Note:** In the **Market Explorer** window, the outright contracts for DME and NYMEX energy products list under **Future** while the corresponding spreads list under **Spread**.

**Configuring Support for Inter-Exchange Spreads** Trading of IES contracts is supported on the TT CME Gateway by enabling channels for the two outright futures products in addition to the INTER\_EXCHANGE\_SPREAD channel in the [price\_session] section of the **hostinfo.cfg** file. For example, enable the following channels to trade NYMEX-DME implied inter-exchange spreads:

- NYMEX\_FAST\_OIL\_GASOLINE\_IPORT
- DME\_FUTURES
- INTER\_EXCHANGE\_SPREADS

Trading of DME and NYMEX products are supported on the gateway, so verify that these parameters are enabled.

The three parameters enabled for trading NYMEX-DME inter-exchange spreads are shown in the following example.

**Example:**

```
FASTSubject9=NYMEX_FAST_OIL_GASOLINE_IPORT  
FASTSubject17=DME_FUTURES  
FASTSubject18=INTER_EXCHANGE_SPREADS
```

Because there is a 14 channel limit on TT CME Gateway Versions 7.12.3 or higher, ensure that the TT CME Gateway used for trading inter-exchange spreads has enough capacity to add the additional channel. Refer to the section called **Recommendations for Optimal Performance** on page 70.

The channel definitions are provided by CME Group and included in the **fast.cfg** file provided by TT. The channel for IES products is shown in the following example.

**Example:**

```
[fastInterface]  
Subject=INTER_EXCHANGE_SPREADS  
ChannelNumber=201  
AddressFeedA=224.0.26.74:10034  
AddressFeedB=224.0.27.73:10034  
SnapshotAddressFeedA=224.0.26.75:11034  
SnapshotAddressFeedB=224.0.27.74:11034  
InstrumentAddressFeedA=224.0.26.76:12034  
InstrumentAddressFeedB=224.0.27.75:12034
```

For more information regarding how the TT CME Gateway uses the **fast.cfg** file, refer to the section called **Example: fast.cfg** on page 67.



## Support for Bursa Malaysia Products

<b>Overview</b>	TT CME Gateway Version 7.14.0 and higher supports trading of Bursa Malaysia Derivatives (BMD) products using the CME Globex electronic trading platform.
<b>Connectivity</b>	Gateway connectivity to Bursa Malaysia is done via Globex using your existing circuits. No additional lines are needed, and no changes are needed to your market data platform or iLink Gateway connectivity. However, traders need separate iLink sessions for trading BMD products.
<b>Membership and Clearing</b>	<p>You must establish all appropriate agreements and accounts with a Bursa Malaysia Clearing Firm to be authorized to trade BMD products.</p> <div style="border: 1px solid black; padding: 5px;"> <p><b>Note:</b> Bursa Malaysia requires traders to have a separate iLink session to be used exclusively for trading BMD products.</p> </div> <p>Any trades of BMD products via the Globex platform are cleared by the Bursa Malaysia clearing firm, and are matched by the Bursa Malaysia matching engine.</p>
<b>Available Products</b>	<p>The TT CME Gateway supports trading BMD Futures, Options, and Spreads. For a complete list of BMD products and their product codes, refer to: <a href="http://www.bursamalaysia.com/website/bm/products_and_services/derivatives.html">http://www.bursamalaysia.com/website/bm/products_and_services/derivatives.html</a></p>
<b>TT CME Gateway Configuration</b>	<p><b>Market Data</b></p> <p>Trading is supported on the TT CME Gateway by enabling the price feed channels for Bursa Malaysia subjects in the [price_session] section of the <b>hostinfo.cfg</b> file. To enable a channel, remove the # character to “uncomment” the corresponding FIX/FAST subject parameter.</p> <div style="border: 1px solid black; padding: 5px;"> <p><b>Note:</b> Ensure that the TT CME Gateway where the BMD channels will be enabled is currently subscribed to less than 14 Price Feed channels. Once the Bursa Malaysia Futures and Options channels have been enabled, the total number of Price Feed channels cannot exceed 14 on the gateway.</p> </div> <p>The FIX/FAST subject parameters for Bursa Malaysia are included in a clean install of the <b>hostinfo.cfg</b> file. However, after an upgrade, you will have to manually update the <b>hostinfo.cfg</b> file with the Bursa Malaysia parameters from the master file. For more information about updating a <b>hostinfo.cfg</b> file from the master file, refer to the section called <b>Master Files</b> on page 33.</p> <p>The channel definitions for BMD products are provided by CME Group and included in the <b>fast.cfg</b> file installed on the TT CME Gateway. TT has also provided the <b>fast.cfg</b> file for trading BMD products as an attachment to CA140-10. BMD Futures are provided on MDP channel 22; BMD Options are on channel 23. For more information regarding how the TT CME Gateway uses the <b>fast.cfg</b> file, refer to the section called <b>Example: fast.cfg</b> on page 67.</p> <p><b>iLink Order Sessions</b></p> <p>On the TT CME Gateway with BMD products enabled, you must configure new, dedicated iLink order sessions to be used exclusively for trading these products. To configure an iLink order session, refer to the section called <b>Section: [order_session]</b> on page 115.</p>

**Note:** If you choose to configure these iLink sessions on an existing TT CME Gateway, traders will see both BMD and non-BMD products and contracts, but will not be able to trade both via that gateway. Traders will only be able to trade through the iLink session that has been mapped to their Username.

<b>X_TRADER® Impact</b>	<p>X_TRADER® 7.4.9 or higher is required for trading BMD products.</p> <p>All BMD products traded using the Globex platform appear as 4-character product codes in the TT system. For example, BMD Futures appear as "FKLI" in X_TRADER®, while BMD Options appear as "OKLI". All Futures product codes begin with "F" and all options begin with "O". This also applies to BMD spreads and strategies (e.g., all BMD options strategies list under "OKLI" in X_TRADER®).</p>
<b>Risk Impact</b>	<p>In order to view P&amp;L in the native currency for all BMD products (except the USD Crude Palm Oil Futures), as well as ensure proper risk calculation when applying credit, you must add Malaysian Ringgit (currency code: MYR) to your Guardian currency table. For procedures to update the currency table, refer to the <i>Guardian 7.x Online Help</i>.</p>
<b>FIX Adapter Impact</b>	<p>Customers wishing to connect TT FIX Adapters to TT CME Gateways configured with BMD iLink sessions are strongly advised to contact TT Developer Technical Support (DTS) at <a href="http://devnet.tradingtechnologies.com">http://devnet.tradingtechnologies.com</a>.</p>
<b>BMD Supported Order Types</b>	<p>The TT CME Gateway supports the following order types for BMD Futures, Spreads, and Options products:</p> <ul style="list-style-type: none"> <li>• Limit</li> <li>• Stop-Limit</li> <li>• Market-Limit</li> <li>• FAK</li> </ul>
<b>Supported Exchange Functionality for BMD Products</b>	<p>BMD products are eligible for the following exchange features supported by the gateway:</p> <ul style="list-style-type: none"> <li>• Cancel on Disconnect (COD)</li> <li>• User Defined Strategies (UDS)</li> <li>• Spreads (prelisted multi-leg strategies)</li> <li>• Implied Trading</li> <li>• Mass Quotes</li> <li>• Request for Quote (RFQ)</li> <li>• Good Till Cancel (GTC) orders</li> <li>• Good Til Date (GTDate) orders</li> </ul>
<b>Unsupported Exchange Functionality for BMD Products</b>	<p>BMD products are not eligible for the following exchange features:</p> <ul style="list-style-type: none"> <li>• Request for Cross (RFC)</li> <li>• Privately Negotiated Trades (PNT)</li> </ul>





## Understanding Order Management

### Order Server Data Flow 7.14.x

**Note:** Terminology used in the following data flow matches terminology used in the Gateway System - Logical Architecture diagram. Also, native orders are those orders normally accepted by the exchange's API.

The following is a description of the Order Feed connection from the Order Server on the CME Gateway to the exchange.

- Upon startup, the Order Server reads any working orders contained in the **\*\_SessionIdMemberId\_Mode\_orders.tbl** files into memory.
- X\_TRADER® submits an order to the Order Server.
- After receipt, the Order Server passes it to the appropriate Order Router. For details on how the Order Server determines the Order Router to which it passes the order, refer to the section called **Order Router Determination 7.14.x** on page 95.
- The Order Router assigns a TON to the order and then updates the Order Book with the new order information.
- The Order Router records the order in its **\*\_SessionIdMemberId\_Mode\_orders.tbl** files.
- The Order Router sends an ACCEPT/Add message to the trader's Audit Trail (in X\_TRADER®).
- The Order Router sends the order to the CME Group host.
- Upon receipt, the CME Group host sends an order confirmation (containing the TON) back to the Order Router. For further information on the TON, refer to the section called **Trade Order Number** on page 110.
- The Order Router updates the Order Book with the TON Number to indicate that a confirmation was received, and writes it to its **\*\_SessionIdMemberId\_Mode\_orders.tbl** files.
- The Order Router sends the order confirmation (as an OK/ADD) to the trader's Audit Trail in X\_TRADER®.

### Order Server Data Flow 7.15.x or higher

**Note:** Terminology used in the following data flow matches terminology used in the Gateway System - Logical Architecture diagram. Also, native orders are those orders normally accepted by the exchange's API.

The following is a description of the Order Feed connection from the Order Server on the CME Gateway to the exchange.

- Upon startup, the Order Server reads any working orders contained in the **\*\_mode\_orders.tbl** file into memory.
- X\_TRADER® submits an order to the Order Server.
- After receipt, the Order Server passes it to the appropriate Order Router (i.e., session connection).
- The Order Server assigns a TON (Trade Order Number) to the order and then updates the Order Book with the new order information. For further information on the TON, refer to the section called **Trade Order Number** on page 110.



- The Order Server records the order in its **\*\_mode\_orders.tbl** file.
- The Order Server sends an ACCEPT/Add message to the trader's Audit Trail (in X\_TRADER®).
- The Order Server sends the order to the exchange host.
- Upon receipt, the exchange host sends an order confirmation (containing the TON) back to the Order Server, and the order confirmation is sent (as an OK/ADD) to the trader's Audit Trail in X\_TRADER®.
- The Order Server updates the Order Book with the TON Number to indicate that a confirmation was received, and writes it to the **\*\_mode\_orders.tbl** file.

---

## Fill Server Data Flow

**Note:** Terminology used in the following data flow matches terminology used in the Gateway System - Logical Architecture diagram. Also, native orders are those orders normally accepted by the exchange's API.

The Logical Architecture diagram illustrates the following fill flow:

- The CME Group host matches the order.
- The CME Group host sends a fill, with the TON, to the Order Router.
- The Order Router matches the fill to the recorded order in the Order Book and updates the Order Book according to the type of fill received:
  - If the TON for the fill does not match a TON for an order in the order book, the Order Router notifies the trader's and supervisory trader's Audit Trails that the trader received a fill but that the fill does not match any of the orders in the Order Book.
  - If the fill completes the order, the Order Router removes the order from the Order Book.
  - If the fill does not complete the order (i.e., it is a partial fill), the Order Router updates the Order Book to reflect the partial fill.
- The Order Router writes order changes to the **\*\_mode\_orders.tbl** file and records the fill in its unique **fills.tbl** file.

**Note:** The Order Server deletes completed orders from its **\*\_mode\_orders.tbl** file only when it restarts.

- Simultaneously, the Order Router:
  - Sends a fill response to X\_TRADER®. X\_TRADER® displays a fill in the Audit Trail. X\_TRADER® updates the relevant files and screens (i.e., if it is a complete fill, the order is removed from the X\_TRADER® Order Book).
  - Sends the fill to the Fill Server.
- The Fill Server records the fill to the **bof.tbl** file and the FS Log.
- X\_TRADER® displays the fill in the Fill window.

## Configuring the Order Server and Order Routers

### Adding [order\_session\_#] sections

If you need to configure additional order sessions, for each session you must:

- Add a [order\_session\_#] section with a unique set of connection information.
- This information includes Member, PrimaryIP, and CTI/Origin mapping.

#### ► To add a new [order\_session\_#] section:

1. Open **hostinfo.cfg**.
2. Add the new [order\_session\_#] section.
3. Add all new trader login IDs to the Windows User Authentication System (WUAS) on the TT Gateway or Domain Controller.
4. Verify that the Price Server is running. If it is not running, start it. Refer to the procedure called **To start the Price Server:** in Chapter 3, [Configuring Global Settings](#)
5. Stop and restart the Order Server on the CME Gateway.
6. After restarting the Order Server, have a trader log into the CME Gateway using the `Member` of the new section that you added.
7. In Guardian, using the **View Status** function, you can see an Order Router appear listing the new connection.

### Order Routers

Although the TT Gateway uses Order Routers, they run as threads within the Order Server and not as separate processes on the TT Gateway. You must configure each Order Router's connection to the CME Group.



**Tip:** You can map multiple memberships to the same Order Router. If you expect to generate a high volume of traders, TT recommends that you configure multiple [order\_session\_#] sections, each with a unique set of information (obtained from the CME Group). Generally, TT recommends that each session support no more than an average of 5 transactions per second.

On a CME Gateway:

- **ttchron.ini** does not contain an Order Router section.
- Each order session must have its own section in the **hostinfo.cfg** file called [order\_session\_#]. This section configures the Order Router that hosts the session.
- Guardian displays individual Order Routers and their status for a specified CME Gateway when you use Guardian's administrative function called **View Status**.

For further information on Order Routers and their behavior, refer to Chapter 6, [Disaster Recovery](#)

### Multi-Member Order Routers

To configure an Order Router to support multiple memberships:

- The customer must contact the CME Group and have the exchange enable this functionality.
- For all multi-member Order Routers, CME Group must distribute the appropriate `SessionId` and all `FirmID` values for use by each order session.
- The CME Group maps traders on their end according to the `SessionID` and the TT Trader ID. Thus, to complete multi-member setup, you may have

to furnish this data (TT Trader IDs) to the CME Group.

- To set up the multi-member Order Router (i.e., the [order\_session\_#] section), use the `SessionID` and `MemberID` of one of the memberships that are assigned to the multi-member Order Router.

There is no additional change to trader setup (i.e., risk parameter configuration). All traders must have their Trader IDs in the WUAS on the TT Gateway (or Domain Controller) and be set up in Guardian to trade.



---

**Order Router  
Determination 7.14.x**

Some customers have traders that use a Member ID (`SessionIdFirmId` concatenation) which does not match the member parameter of an order session in the CME Gateway's **hostinfo.cfg** file.

Whenever the Order Server receives an order, it uses the following logic to determine where to route the order:

- If the trader's Member ID matches the member parameter in a `[order_session_#]` section, the trader is routed through that same Order Router. This is the normal operation.
- The Order Server compares the first `x` characters of the order's associated Member ID.
- If the first `x` characters of the Member ID match the first `x` characters of the `member` parameter in a `[order_session_#]` section, the order is routed through that same Order Router.
- If multiple `[order_session_#]` sections have the same `x` characters, the Order Server randomly assigns the order to one of these Order Routers.
- If the first `x` characters of the Member ID do not match the first `x` characters of the member parameter in a `[order_session_#]` section, the Order Server rejects the order.

---

**Order Session  
Identification**

TT Gateways 7.16 and higher contain an enhancement that displays the exchange credential used to route all orders and fills through the exchange. This includes all order modifications and exchange rejects but does not include orders actions on Hold orders and position reserve orders.

Currently, this value is available in the following locations:

- Audit logs: appears in the **ExchangeCredentials** column
- Order Server logfile
- FIX Adapter 7.8: via Tag 18216 (**ExchCred**)

**Note:** The exchange credential will be available in future versions of other TT client applications.

To provide users a way to identify which order session routed a particular order on a CME Gateway, the order session is identified by the Member ID (`SessionIdFirmId` concatenation) configured in **hostinfo.cfg**. The session identification appears on orders and fills for all order actions (add, modify, cancel) routed to the exchange. If the gateway rejects an order action, the session is not identified.

---

**Maximum Supported  
Order Sessions**

TT currently supports up to 100 separate order sessions on each CME Gateway 7.16. Internal testing shows that this amount of order sessions supports the optimal performance during continuous operation and periods of heavy order entry.

TT recommends users work with their Technical Account Manager (TAM) to accurately load balance traders across multiple order sessions.



**Configuring the Order Server Start Parameter**

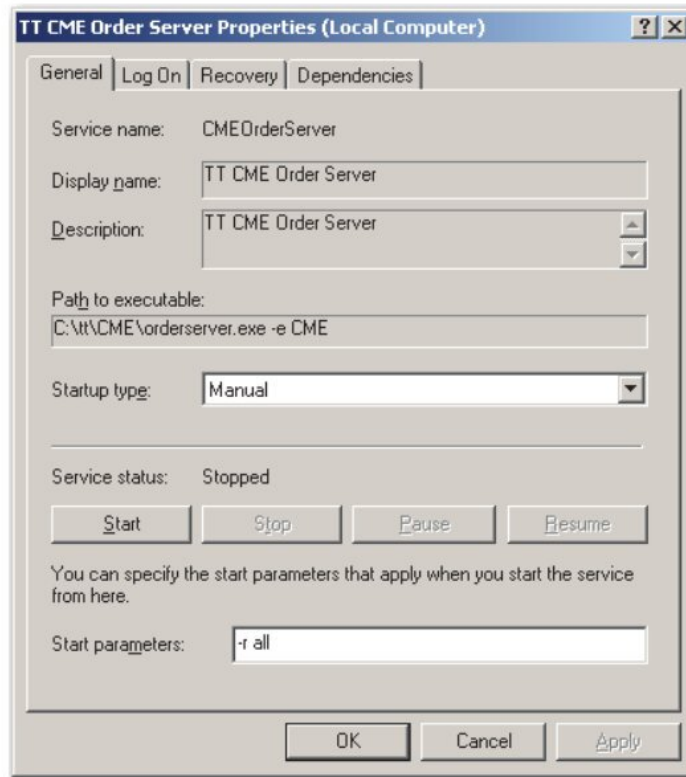
You can configure a start parameter when starting the Order Server via the **Services** dialog box. Currently, the CME Gateway supports the following parameter:

Parameter	Description
-r	<p>This parameter enables the Order Server to reset the sequence numbers for all or specific iLink Order Sessions on the CME Gateway.</p> <ul style="list-style-type: none"> <li>To reset all iLink sessions, use the format: OrderServer.exe -r all</li> <li>To reset a single iLink session, use the format: OrderServer.exe -r iLinkID1</li> <li>To reset multiple iLink sessions, use the format: OrderServer.exe -r iLinkID1;iLinkID2</li> </ul> <p>For multiple iLink sessions, enter a semi-colon delimiter between each iLink ID listed.</p> <p><b>NOTE:</b> A <b>space</b> is required between -r and the parameter settings (e.g., -r all)</p>

**Table 13. Order Server Startup Command Line Parameter**

► **To configure the Order Server start parameter**

1. Click on the **Start** menu, select **Administrative Tools**, and then **Services**
2. Right-click the Order Server service and select **Properties**
3. In the **Start parameters:** field, configure the -r parameter.
4. After configuring the parameter, click **Start**



5. Click **OK**

## TT Gateway Support for Mandatory iLink Tags

**Overview** In order to enhance customer support and assist in market oversight, the CME Group has defined mandatory FIX tags for inbound and outbound iLink messages. CME Gateway 7.14.3 and higher supports the mandatory iLink message tags required by the CME Group.

**Gateway Behavior** The following table shows what values are populated by the CME Gateway for each iLink tag, and describes when each tag gets populated.

iLink Tag and Name	TT Definition	When it is Populated	TT Value
1603-TradingSystemName	Indicates that an iLink session has been established with the exchange host via a CME Gateway.	At session logon only.	CME Gateway <b>Note:</b> This value is the same for both the CME Gateway and CBOT Gateway.
1604-TradingSystemVersion	Indicates the CME Gateway software package VRMF number.	At session logon only.	7.x.x.x (e.g., 7.14.3.0)
1605-TradingSystemVendor	Identifies TT as the vendor of the CME Gateway.	At session logon only.	TT

**Table 14. Gateway Behavior for Mandatory iLink Tags**

iLink Tag and Name	TT Definition	When it is Populated	TT Value
142- <code>SenderLocationID</code>	Indicates the location of a trader originating an order action manually via X_TRADER® or automatically via an API or strategy engine (SE). In messages unrelated to order actions, this tag indicates the location of the CME Gateway connecting to the exchange.	<p>This tag is populated when the gateway sends application (e.g., order entry) and administrative (e.g., session logon) iLink messages to the exchange.</p> <p>For iLink application messages, Tag 142 is populated for the following order actions sent manually or automatically to the exchange: New Order, Order Cancel, Order Cancel/Replace, Order Inquire, Security Definition Request, and Quote Request.</p> <p>For iLink administrative messages, Tag 142 is populated at session logon and when the following messages are sent over an established session: Heartbeat, Test Request, Resend Request, Sequence Request and Logout.</p>	<p>For iLink application messages, the CME Gateway populates this tag with the location value forwarded by the clients.</p> <p>If no value is forwarded by the clients, the gateway populates this tag with the value "UNKNOWN".</p> <p>For iLink administrative messages, this tag is populated with the value manually configured on the CME Gateway (e.g., <code>US</code>, <code>IL</code>). Refer to the section called <b>Configuring Gateway Location</b> on page 98.</p>
1028- <code>ManualOrderIndicator</code>	Indicates whether an order action was submitted manually via X_TRADER® or automatically via an API or strategy engine (SE).	This tag is populated for all application messages (i.e., originating order actions) sent to the exchange per iLink session. It is <i>not</i> populated in any iLink administrative messages.	<p>Valid values are: <code>Y</code> (manual) or <code>N</code> (automated).</p> <p>Tag 1028 for RFQ requests and strategy creation requests always default to 1028=<code>Y</code> (manual).</p> <p>The CME Gateway populates Tag 1028 based on the value set by the clients. If no value is forwarded by the clients, the CME Gateway populates Tag 1028 as "Y" for order actions sent via X_TRADER®, or "N" for order actions originating from either an API (XTAPI, TT API, FIX Adapter) or strategy engine (ASE, SSE, AlgoSE).</p>

Table 14. Gateway Behavior for Mandatory iLink Tags

### Configuring Gateway Location



**Warning:** The CME Gateway will not start unless the `[location]` section is correctly configured in `hostinfo.cfg`.

For new installations of the CME Gateway Version 7.14.3 or higher, the `[location]` parameters are included in `hostinfo.cfg` by default.

In order to populate the gateway location (Tag 142) for session logon and other administrative messages, the CME Gateway uses the `Country` and `StateProvince` parameters configured in the `[location]` section of `hostinfo.cfg`.

#### ► To Configure Gateway Location

1. Using a text editor, open `<root drive>:\tt\config\<Exchange-flavor>hostinfo.cfg`
2. Configure the following parameters.

Parameter	Description
[location]	<p>This section is required for all order routing CME Gateways and applies to all order sessions configured on the Gateway.</p> <p><b>WARNING:</b> If the [location] section is missing, commented-out, or configured incorrectly in the <code>hostinfo.cfg</code> file on an order routing CME Gateway, the Gateway will not start and will appear Red in Guardian.</p>
Country	<p>Required parameter that sets the location of the CME Gateway originating the session logon and other administrative messages (Heartbeat, Test Request, Resend Request, Sequence Request and Logout).</p> <p>This parameter is not case-sensitive. Valid values are a 2-character ISO country code (e.g., <code>Country=US</code>). ISO country codes are provided by the CME Group at: <a href="http://ftp.cmegroup.com/fix/coo">ftp.cmegroup.com/fix/coo</a></p> <p><b>WARNING:</b> If the Country parameter is missing, commented-out, or does not specify a 2-character value or is configured incorrectly, the gateway will not start and will appear Red in Guardian.</p> <p><b>Note:</b> The CME Gateway does not validate the actual ISO code values entered in this section; it just checks whether it was entered as a 2-character value. The exchange will audit these values for accuracy; however, invalid ISO codes will not cause order actions to be rejected.</p>
StateProvince	<p>Optional parameter that sets the location of the CME Gateway originating the session logon and other administrative messages (Heartbeat, Test Request, Resend Request, Sequence Request and Logout).</p> <p>This parameter is not case-sensitive. Valid values are a 2-character ISO state or province (e.g., <code>StateProvince=IL</code>). ISO state and province codes are provided by the CME Group at: <a href="http://ftp.cmegroup.com/fix/coo">ftp.cmegroup.com/fix/coo</a>.</p> <p><b>WARNING:</b> If the StateProvince parameter does not specify a 2-character value or is configured incorrectly, the gateway will not start and will appear Red in Guardian.</p> <p><b>Note:</b> The CME Gateway does not validate the actual ISO code values entered in this section; it just checks whether it was entered as a 2-character value. The exchange will audit these values for accuracy; however, invalid ISO codes will not cause order actions to be rejected.</p>

**Table 15. Mandatory iLink Tag Configuration Parameters**

3. Save the changes and close the file.



**Example: [location]**

The following example shows the [location] section correctly configured at the top of the **hostinfo.cfg** file.

**Example:**

```
## Global section Location is mandatory and applies to all the order
Sessions on the Gateway.
## Within the Location section:
## i) a mandatory parameter named Country is required and should be the 2
character country code per ISO 3166-1.
## ii) an optional parameter named StateProvince. if provided, it has to
be 2 characters.
##
## For example,
##
## [location]
## Country=US
## StateProvince=IL
##
## [location]
## Country=GB

[location]
Country=US
StateProvince=IL
```

**Interpreting Log Files**

Tag 142 and Tag 1028 are populated by the CME Gateway and appear in the following TT log files regardless of whether they are returned in exchange acknowledgement and response messages:

- FIX log (e.g., **<drive:> //tt/logfiles/CME\_R80000\_Send-Recv\_2011-06-03.log**)
- Order Server log (e.g., **<drive:> //tt/logfiles/CME-G\_PROD\_OrderServer\_2011-06-03**).
- Audit files (e.g., **<drive:> //tt/auditfiles/CME-G\_2011-06-03.cba**).

For location, the exchange returns the country code and state or province in Tag 143.

Refer to the following examples when troubleshooting or interpreting logfiles for location and automated trading indicator values. The first example is the FIX Log entry at session logon.

**Example: Logon Message in Send-Recv FIX Log**

```
Send(02/16/2011-
09:22:55.985)|8=FIX.4.29=0014535=A49=S11000U56=CME57=G50=S11X 142=US,IL
34=1369=052=20110216-15:22:55.985108=3095=396=S11 1603=CME Gateway
1604=7.14.3.7 1605=TT 98=010=078
Recv(02/16/2011-
09:22:57.483)|8=FIX.4.29=18935=534=2584369=273452=20110216-
15:23:03.84149=CME50=G56=S11000U57=S11X 143=US,IL 58=Sequence number
received lower than expected. Expected [2735] Received 1. Logout
forced.789=273510=037
```

The next example shows the FIX Log entry for an order entered manually through the CME Gateway.

**Example: Order Add in Send-Recv FIX Log**

```
Send(02/15/2011-
10:43:42.307) | 8=FIX.4.29=0026135=D49=S18000P56=CME57=G50=TT1 142=US,IL
34=5748369=537152=20110215-
16:43:42.307204=055=2V48=914259167=OPT107=UD:2V: GN
02159142599717=000004KW11=000004KW1=REDG2TT29702=321=154=140=277=O 1028=Y
38=544=120200=20110260=20110215-16:43:42.30710=238
Recv(02/15/2011-
10:43:42.322) | 8=FIX.4.29=30035=834=5372369=574852=20110215-
16:43:50.56849=CME50=G56=S18000P57=TT1 143=US,IL
1=REDG2TT26=011=000004KW14=017=54207:94139020=037=546728136738=539=040=2
41=044=12048=91425954=155=2V59=060=20110215-16:43:50.562107=UD:2V: GN
0215914259150=0151=5432=20110215 1028=Y 9717=004KW10=053
```

This last example shows the Order Server log entry at gateway startup.

**Example:** Startup message in Order Server log

```
16.02.2011 09:15:14.346 | ORDERSERVER/SIM | 5712 | INFO | 10068000 | CME-
M O R D E R S E R V E R S T A R T I N G (PID: 5696) (EID: 686)
...
16.02.2011 09:15:18.340 | ORDERSERVER/SIM | 5712 | INFO | 10078106 | New
key in location: countrystate = US,IL
```

The following message appears in the Order Server log when [location] is incorrectly configured.

**Example:** Location configuration error in Order Server log

```
22.02.2011 09:47:22.671 | ORDERSERVER/SIM | 5860 | ERROR | 10078028 |
Config Error: Error processing config file (Location section not defined).
```

CME Gateway Audit files have three additional fields that appear after each order action in the file to show location and automated trading indicator values.

CountryCode=	RegionCode=	OrderSourceAutomated=0
CountryCode=	RegionCode=	OrderSourceAutomated=0
CountryCode=US	RegionCode=IL	OrderSourceAutomated=1
CountryCode=US	RegionCode=IL	OrderSourceAutomated=1

The CountryCode field includes the ISO country of origin code and the RegionCode field includes the ISO region code (U.S. state or Canada province) if applicable. If TT Clients do not provide this data, these fields are left blank in this audit file.

The OrderSourceAutomated field indicates whether an order action was submitted manually or automatically. Possible values are 0 or 1; where "0" (the default value) indicates the order was entered manually (1028=Y), and "1" indicates the order was submitted via an automated trading system or API (1028=N). The OrderSourceAutomated column is left blank for administrative messages sent by the gateway.

## Upgrade Tasks to Support Mandatory iLink Tags

### List of Upgrade Tasks

To upgrade your trading environment to support the CME Group's mandatory iLink tags, successfully perform the following tasks:

- Upgrade to CME Gateway Version 7.14.3 and correctly configure the location parameters on the gateway.
- Upgrade TT Client applications and clients of APIs to the supported versions listed in this section.
- Install or upgrade to TT User Setup Version 7.4.0 and set up each trader location.

### Upgrading TT Gateways



**Warning:** After an upgrade to CME Gateway 7.14.3, the [location] section must be added to the top or bottom of your existing **hostinfo.cfg** file. If [location] is added in any other place in the file (e.g., between order sessions), the gateway will not start.

After an upgrade to CME Gateway Version 7.14.3 or higher, you have to manually add the [location] section to your existing **hostinfo.cfg** using the **hostinfo.cfg\_master** file as a reference. This section is required on all order routing CME Gateways. This section can be added to MPF Price Servers, but it is not required.

#### ► To add [location] using hostinfo.cfg\_master as a reference

1. Using a text editor (e.g., Notepad), open **<root drive>:\tt\<Exchange-flavor>\<Exchange-flavor>hostinfo.cfg\_master**
2. Copy the [location] section and paste it as a separate section at the top or bottom of your current **<root drive>:\tt\config\<Exchange-flavor>hostinfo.cfg** file. Refer to the section called **Example: [location] in an Upgraded Hostinfo.cfg File** on page 103.
3. Configure the [location] section. Refer to the section called **Configuring Gateway Location** on page 98.
4. Save the changes and close both files.

**Example: [location] in an Upgraded Hostinfo.cfg File**

The following example shows [location] correctly added and configured before [order\_session\_1] at the top of the **hostinfo.cfg** file.

**Example:**

```
## Global section Location is mandatory and applies to all the order
Sessions on the Gateway.
## Within the Location section:
## i) a mandatory parameter named Country is required and should be the 2
character country code per ISO 3166-1.
## ii) an optional parameter named StateProvince. if provided, it has to
be 2 characters.
##
## For example,
##
## [location]
## Country=US
## StateProvince=IL
##
## [location]
## Country=GB

[location]
Country=US
StateProvince=IL

[order_session_1]
Member=TR409
Password=TR4
iLinkPrimaryIP=10.140.120.45
iLinkPrimaryPort=11092
A1=40
G1=30
G2=40
M1=10
M2=21
P1=10
P2=21
U1=10
```

**Upgrading TT Clients**

When upgrading TT Client applications to support the mandatory iLink Tags, you can upgrade to the minimum supported versions independently of when the CME Gateway is upgraded. The timing of the TT Client upgrades should be based on the needs of your trading environment.

The following table lists the TT Client versions required for supporting mandatory iLink tags in your trading environment, and describes their impact on the CME Gateway.



TT Client	Minimum Supported Version	TT Gateway Impact
TT User Setup*	7.4.0	Version 7.4.0 is required to set the location value in trader profiles configured in the TT User Setup database. For each supported order action, the location value is determined by the trader's profile in TT User Setup and forwarded to the CME Gateway.
X_TRADER®	7.9.1	<p>This version sends the Tag 142 (location) value configured in a trader profile in TT User Setup and forwards it to the CME Gateway. X_TRADER® 7.9.1 also sets the Tag 1028 (automated trading indicator) flag and sends it to the gateway.</p> <p>The location and automated trading indicator values are not visible in the X_TRADER® displays (e.g., Fill Window, Order Book, etc.).</p>
X_TRADER® API	7.7.0	<p>The location value is determined by the trader's profile in TT User Setup. X_TRADER® API forwards the value provided by X_TRADER when submitting an order through the CME Gateway.</p> <p>The Tag 1028 flag for all X_TRADER® API applications defaults to "automated". X_TRADER® API allows customers to override this flag on a per order basis. Older versions of X_TRADER® API applications can be modified to override the default setting and flag orders as being submitted "manually".</p>
Autospreader® SE (ASE)	7.2	<p>This version of ASE accepts the location value from the client (X_TRADER®, X_TRADER® API, FIX Adapter) and sends it to the CME Gateway to be populated in Tag 142. This sets the location tag based on the location of the trader who originated the order action on the ASE server.</p> <p>ASE always sets the automated trading indicator flag as "automated" regardless of what it receives from clients. The CME Gateway populates Tag 1028=N (automated) by default for all order actions submitted via the ASE server.</p>

**Table 16. TT Client Applications to Support Mandatory iLink Tags**

TT Client	Minimum Supported Version	TT Gateway Impact
Synthetic SE (SSE)	7.1.3	<p>This version of SSE accepts the location value from the client (X_TRADER®, X_TRADER® API, FIX Adapter) and sends it to the CME Gateway to be populated in Tag 142. This sets the location tag based on the location of the trader who originated the order action on the ASE server.</p> <p>SSE always sets the automated trading indicator flag as "automated" regardless of what it receives from clients. The CME Gateway populates Tag 1028=N (automated) by default for all order actions submitted via the SSE server.</p>
AlgoSE	7.10.0	<p>This version of AlgoSE accepts the location value from the client (X_TRADER®, X_TRADER® API, FIX Adapter) and sends it to the CME Gateway to be populated in Tag 142. This sets the location tag based on the location of the trader who originated the order action on the ASE server.</p> <p>AlgoSE always sets the automated trading indicator flag as "automated" regardless of what it receives from clients. The CME Gateway populates Tag 1028=N (automated) by default for all order actions submitted via the AlgoSE server.</p>
FIX Adapter	7.6.2	<p>The location value is determined by the trader's profile in TT User Setup. FIX Adapter forwards the location provided by the client when routing order actions to the CME Gateway. Third-party applications connecting via FIX Adapter can be modified to override the default location defined in TT User Setup.</p> <p>The Tag 1028 flag for all API applications defaults to "automated". FIX Adapter allows customers to override this flag on a per order basis. Third-party applications connecting via FIX Adapter can be modified to override the default settings for Tag 1028.</p> <p><b>NOTE:</b> If you host TT FIX Adapter versions 7.5.8 and lower in your trading environment, you are strongly encouraged to contact TT Development Technical Support at <a href="http://devnet.tradingtechnologies.com">http://devnet.tradingtechnologies.com</a> for assistance with upgrading to TT FIX Adapter 7.6.2.</p>

\* Required with CME Gateway 7.14.3 or higher.

**Table 16. TT Client Applications to Support Mandatory iLink Tags**

**Installing or Upgrading to TT User Setup 7.4.0 or higher**

TT User Setup 7.4.0 or higher is required for identifying trader location. You need to upgrade to this version if you are currently using TT User Setup, or do a clean install and migrate trader logins to this application if you are a first-time user.

To migrate trader logins to this application, refer to the *TT User Setup System Administration Manual*. To configure trader locations, refer to the *TT User Setup User Guide*.

## Support of Post-Trade Functionality

<b>Overview</b>	<p>The CME Gateway supports orders designated for post-trade processing by CME Clearing. These orders are entered using clearing member codes in the <b>Give Up</b> field or special characters in the trader's <b>Account#</b> field in the X_TRADER<sup>®</sup> Customer Defaults profile. Orders requiring special characters can also be entered using the account number field in the X_TRADER<sup>®</sup> Market Window.</p> <p>The following orders are entered using codes in the <b>Give Up</b> field:</p> <ul style="list-style-type: none"> <li>• MultiFirm Give Up orders</li> <li>• Mutual Offset System (MOS) orders</li> </ul> <p>Orders using special characters in the <b>Account#</b> field or entered directly in the X_TRADER<sup>®</sup> Market Window are:</p> <ul style="list-style-type: none"> <li>• Average Price System (APS) orders</li> <li>• Single Line Entry of Differential Spreads (SLEDS) orders</li> <li>• Discretionary Orders</li> <li>• Bunched Account Orders</li> </ul>
<b>Gateway Behavior</b>	<p>The CME Gateway supports post-trade functionality at order entry, and is not involved in any post-fill or post-trade processing. When codes or special characters are entered in the account number, they appear in the TT system the same way they were entered.</p> <p>For example, if "%4400" is entered in the account number field in the X_TRADER<sup>®</sup> Market Window, the account number will appear in the TT system as "%4400" and not "4400" (special characters ignored). The Gateway routes the special characters and codes to the exchange, and they appear in the fills sent to CME Clearing.</p>
<b>Client Impact</b>	<p>All orders can be designated for post-trade functionality in X_TRADER<sup>®</sup>. Direct Traders can change their Customer Defaults profiles and enter all trades with the special characters or Give Up code, or they can enter their characters in the <b>Account#</b> field in the X_TRADER<sup>®</sup> Market Window field on a per order basis.</p> <p>A TTORD trader is locked into a Direct Trader profile, and cannot change values in the Customer Defaults profile or enter special characters in the Market Window. A separate profile should be set up for TTORD traders.</p> <p>In Guardian or TT User Setup, TTORD traders must be setup with account numbers that include the codes and special characters they plan to use when entering orders. For example, if a TTORD trader places APS orders and SLEDS orders, two separate account numbers with the codes for these types of orders must be pre-listed in Guardian or TT User Setup when the TTORD login is defined.</p>
<b>MultiFirm Give Up Orders</b>	<p>Customers wishing to submit orders that are given up to multiple firms must use one of the following methods:</p> <ul style="list-style-type: none"> <li>• Submit orders with the X_TRADER<sup>®</sup> <b>Account Type</b> set to G2. CME Gateways contain an enhancement that allows you to leave the <b>Give Up</b> field blank. When the order does not have a Give Up account, the gateway returns blank values for <b>Giveup</b> and <b>Clr Mbr</b>.</li> <li>• Use different Account Types (i.e., G1 or M1) to submit orders to multiple firms. However, you must set GiveupAccounts=G1, M1 in the [order_session_#] section of the <b>hostinfo.cfg</b> file.</li> </ul>



After being matched, Give Up orders are sent to the CME Group's Allocation/Claim System (ACS). The executing firm's back-office staff use ACS to allocate the trade to multiple firms, who could then accept or reject the trades.

---

#### Mutual Offset System (MOS) Orders

CME Clearing offers a Mutual Offset agreement with the Singapore Exchange (SGX), which allows trades in certain MOS-eligible contracts done at one exchange to be moved to the other exchange's clearing house. The agreement includes trades for the following products:

- Eurodollars
- Euroyen TIBOR
- Nikkei - Yen
- Nikkei - Dollar

To designate orders of MOS-eligible contracts using X\_TRADER:

- Submit orders with the X\_TRADER® **Account Type** set to G2 and manually enter SX123 in the **Give Up** field (where 123 is the 3-digit firm ID of a clearing firm at SGX).
- Create an X\_TRADER® Customer Defaults profile with the *Account Type=G2* and *Give Up= SX123*.

---

#### Average Price System (APS) Orders

The CME Average Price System (APS) enables multiple orders to be grouped together and assigned a single average price across the group. All orders designated for averaging in a group must be for the same contract.

There are two ways to designate trades for the Average Price System at CME Clearing:

- 1 The first method is to group and average multiple orders together. To accomplish this in X\_TRADER®, do the following:
  - Enter a "\$" in the first position of the account number field in the X\_TRADER® Market Window for each order. You can also populate the **Account#** field in a separate profile in Customer Defaults.
  - In the last position of the account number, enter a space followed by a user-defined APS Group ID.

**Example:** Account number designated for multiple APS orders

```
$4440 APS1
```

- 2 The second method is to assign an average price to all partial fills associated with a *single* order: Enter a "#" in the first position of the account number field in the X\_TRADER® Market Window for each order. You can also populate the **Account#** field in a separate profile in Customer Defaults.

**Example:** Account number for a single APS order

```
#4440
```

The TT system accepts and forwards the code entered in front of the account number, which alerts CME clearing to forward brokers the average price for those trades. However, the CME Gateway still uses the actual price of each order and calculates P&L based on this price.

CME clearing uses the APS Group ID to enable APS to identify which multiple orders are grouped and averaged together. Fills for orders that are designated using "\$" or "#" are sent to APS, where the average price is calculated and

assigned to the fills. CME clearing contacts the broker and provides the average price for these trades.

---

### Single Line Entry of Differential Spreads (SLEDS) Orders

For most exchange-defined spreads, traders can designate orders as SLEDS orders, where the spread price is determined by the previous day settlement price of the front leg of the spread. For example, SLEDS orders for Calendar Futures allow traders to determine if they want these trades to be cleared using the prior day settlement price instead of LTP for the front leg of their calendar spread.

To designate a spread order as eligible for SLEDS, enter an ampersand "&" or percent "%" character in the Account Number field in the X\_TRADER® Market Window. You can also populate the **Account#** field in a separate profile in Customer Defaults.

This character must precede any characters entered for APS orders or Give Up orders. If appended after the APS characters or Give Up codes, the SLEDS characters will be treated as part of the account number.

**Example:** Account number in X\_TRADER® for a SLEDS order

```
&4400
```

To have a trade cleared using the LTP for the front leg of the spread, enter the "&" character. To notify CME Clearing that a trade should be cleared using the CME algorithm for the prior day's settlement price, enter a "%" in the account number for your order.

---

### Discretionary Orders

Fills for discretionary orders can be designated for allocation to specific firms or accounts by CME Clearing. This designation is uniquely identified using a "Rule ID," and must be provided in writing to CME Clearing before it can be used in executing a trade.

To designate discretionary orders for allocation, enter an "\*" in the first position of the account number field in the X\_TRADER® Market Window followed by the account number, a "-", and the Rule ID. You can also populate the **Account#** field in a separate profile in Customer Defaults. See the following example.

**Example:** Account number in X\_TRADER® for a Discretionary Order

```
*4400-ID1
```

This designates the order for the CME Clearing Allocate/Claim System (ACS), where the executing firm can allocate the trade to a Give Up firm or accept the trade into its own accounts.

---

### Bunched Account Orders

An executing firm can defer assigning an account number to a trade until after it has been executed. To enter this order in X\_TRADER®, place an "\*" in the first position of the account number in the Market Window, followed by a "dummy" customer account number. You can also populate the **Account#** field in a separate profile in Customer Defaults.

**Example:** Account number in X\_TRADER® for a Bunched Account Order

```
*4400XYZ
```

The fills associated with the order will automatically be routed to the CME Clearing Allocate/Claim System (ACS), where the executing firm's back-office staff assigns the correct firm and account numbers to the trade.

## Additional Considerations

**Overview** This section lists order types supported by the CME Gateway. For a list of order types supported by X\_TRADER<sup>®</sup>, refer to the X\_TRADER<sup>®</sup> *User Manual*.

**Note:** Market and Limit GTC and GTDate order types are not available for trading BM&F BOVESPA products.

**Order Types** The following table lists the various order types that a user can submit through the CME Gateway and whether the order type is synthetically supported by the TT Gateway or natively supported on the exchange.

Support	Order Types
Native (Exchange supports)	Market and Limit GTC Market and Limit FOK Market and Limit FAK Market and Limit GTDate Market and Limit GTD Market and Limit IOC Stop Limit (Futures only) Stop Market (Futures only) Iceberg (Disclosed Quantity)
Synthetic (TT Gateway supports)	CME Gateways do not support synthetic order types.
<p><b>Note:</b></p> <ul style="list-style-type: none"> <li>• CME Group assigns a Limit price to all Stop Market orders. The Exchange refers to these as Stop Orders with Protection. All Stop orders are restricted to Futures only by the Exchange..</li> <li>• For partially filled Market orders, the exchange assigns a Protection Price Limit to the remaining quantity. The exchange calculates the Protection Price Limit by adding/ subtracting the protection points to the best available bid or offer price. The exchange refers to these as Market Orders with Protection.</li> <li>• Market and Limit GTC and GTDate order types are not available for trading BM&amp;FBOVESPA products.</li> </ul>	

**Table 3. Supported Order Types**

**Trade Order Number** The CME Group provides a 32-character, alphanumeric field for use during order submission. Of these 32 characters, CME Group drops the leftmost characters and returns only the Trade Order Number (TON), which consists of the last five characters.

The CME Gateway uses an algorithm to generate a TT Order Number of the appropriate length (eight or six characters) from the timestamp from the CME Gateway. The CME Gateway increments this number by one for each new order.

Whenever the TT Gateway receives order and fill information from the CME Group with an attached TON, the Order Router uses an algorithm to remap the TON (what CME Group gives us) to the original TT Order Number.



## Single Gateway Failure

---

**Gateway Behavior** When a single CME Gateway fails during trading hours, updated Order Book information is not available until the CME Gateway reconnects to the exchange, and traders cannot submit orders via the CME Gateway. All orders currently in the market remain as working orders. If traders want to cancel their orders, they must call the exchange. Clients (e.g., X\_TRADER® workstations) can remain connected to the CME Gateway while the gateway reconnects to the exchange.

---

**Gateway Recovery: Fills** After the CME Gateway begins accepting fills again, X\_TRADER® refreshes the Fill window by downloading the fill information stored in the \*.bof file (located in <root drive>:\tt\datfiles). Additionally, while the CME Gateway is down, CME Group queues any fills that occur. When the gateway reconnects, CME Group sends these fills.

---

**Gateway Recovery: Prices** After it is restarted after a failure, the Price Server goes through the normal price feed connection process as described in the section called **Price Server Data Flow** on page 48.

---

**Gateway Recovery: Order Routers** Order Routers exist on the CME Gateway as threads in the Order Server. Thus, if an Order Router loses its connection, the Order Server restarts it.

When an Order Router thread loses its connection to CME Group, it begins the recovery process detailed below. If at anytime the Order Router regains its connection, it begins communicating with the exchange as normal and the recovery process stops:

- The Order Router attempts to reconnect to the IP address and port set in the `PrimaryIP` and `PrimaryPort` parameters
- The Order Router continues to reconnect using the primary IP address.

While Order Routers cycle, they appear in Guardian in a “feed down” state.

---

**Gateway Recovery: Orders** When it reconnects to the exchange, the CME Gateway automatically requests all Order Book information from the exchange host. Because the exchange host queues all messages that occur while the CME Gateway is disconnected, no order or fill information is lost.

When the Order Server starts, it determines the current Order Book from the \*\_mode\_orders.tbl file, which contains a record of active orders (i.e., working or partially filled orders). Because the Order Server records all order activity to the \*\_mode\_orders.tbl file, the size of this file depends upon the volume of trading activity prior to the failure (i.e., the more the trading activity, the larger the file).



**Warning:** Because the \*\_mode\_orders.tbl file contains a record of all orders, do not delete it! Doing so destroys the CME Gateway’s record regarding order book information. While orders remain active in the market, traders cannot access them through the CME Gateway to change or delete them.

On the CME Gateway, if the Order Server is unable to start up after recovering from the failure (i.e., if it continually restarts), use the `-r` command line parameter to start the Order Server.





**Warning:** Starting the Order Server in this manner can result in the loss of fill information.

---

**Gateway Recovery:  
Hardware**

After you replace any failed hardware and restart the CME Gateway, recovery processes are identical to those listed above for Gateway Software Recovery.

However, if the hard drive is replaced, traders are unable to access any of their order or fill information as the relevant log and table files are permanently lost. Traders must call the exchange and cancel their working orders. If the trader is on a position and must close it, he must do so through a broker.

---

**Example Scenario 1 -  
Single CME Gateway**

Quick Financial Services (QFS) has one CME Gateway. During trading hours, their gateway experiences a drive head crash, and immediately, all traders lose their connection to the exchange. The exchange displays red in Guardian, prices stop updating, and traders stop receiving fills. Even if they have X\_TRADER® open, traders lose the ability to trade on CME Group. Before closing out of their workspaces, traders document their positions. Traders, who must cancel orders, call the exchange.

QFS installs and starts up another CME Gateway that same day. After startup, Jim (a trader) logs into the new CME Gateway. Jim opens up his workspaces and grids. He then begins trading at current market prices.

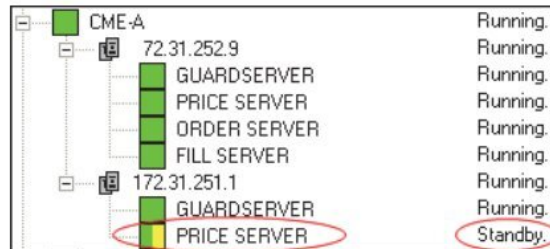
## Price Server Failover

### Overview

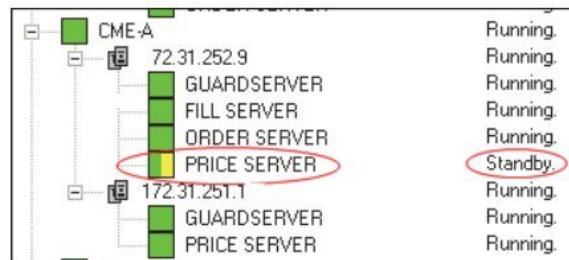
By default, the CME Gateway supports Price Server failover. When an additional CME Gateway is configured with the same Exchange-flavor and channels as the primary CME Gateway, the Price Server of the primary gateway will failover to the secondary gateway Price Server in the event of a service failure.

### Gateway Behavior During Price Server Failover

The following figure shows how a CME Gateway configured for Price Server failover appears in Guardian.



The MDP price feed multicasts prices to both Price Servers, so either Price Server (the primary or secondary) can be active in a Price Server failover configuration. For example, in the event of a primary gateway Price Server restart or service failure, the secondary gateway Price Server (e.g., **CME-A**, 172.31.251.1) will go from Standby to Running. Once the primary gateway Price Server (e.g., **CME-A**, 72.31.252.9) is back in service, it will appear in Standby mode as half green & half yellow in Guardian. The following figure shows how the primary gateway Price Server appears in Guardian after a successful failover to the secondary gateway Price Server.



There is no impact to working orders or order routers, etc., during a Price Server Failover. The Order Server is unaffected.

There is also no impact on client subscriptions to the CME Gateway during a Price Server failover. The only difference is prices are now received by the secondary Price Server, while orders continue to be routed through the Order Server on the primary CME Gateway. The failover process lasts just a few seconds.

### Configuring Price Server Failover

You need to consider the following when configuring Price Server failover:

- The secondary CME Gateway and Price Server must be the same version and configured with the same Exchange-flavor as the primary CME Gateway (e.g., CME-A).
- Any changes made in the **aconfig.xml** and **aconfig\_local.xml** files (e.g., enabling PFX) need to be made on both CME Gateways.
- The **hostinfo.cfg** file on the primary and secondary CME Gateways needs to be configured with the following:
  - The same settings for the `price_session` section parameters.

- Identical product subscriptions. For example, if the primary gateway is subscribing to DME Futures (e.g., `FASTSubject17=DME_FUTURES` is uncommented), then the secondary gateway also needs to be configured to subscribe to DME Futures.
- Unique `NetworkInterface` and `NetworkInterfaceFeed*` parameters in **hostinfo.cfg** on each gateway.
- To configure the secondary CME Gateway so that only the Price Server runs, comment-out the Order Server and Fill Server sections in **ttchron.ini** on the secondary CME Gateway.
- Identical **fast.cfg** files are required on both the primary and secondary CME Gateways.

## Failover Behavior: Secondary CME Gateway

<b>Overview</b>	<p>Secondary CME Gateways offer traders the opportunity to continue trading should one or more routes to the CME Group fail. When a CME Gateway fails in a failover environment during trading hours, all current orders remain as working orders in the market</p>
	<p><b>Note:</b> You can use secondary, redundant CME Gateways under the following conditions:</p> <ul style="list-style-type: none"> <li>• Each has a unique exchange-flavor.</li> <li>• You do not repeat the member parameter in any [order_session_#] sections in the hostinfo.cfg files on other CME Gateways.</li> </ul>
	<p>When you set up secondary CME Gateways on a network, traders can log into another CME Gateway to continue trading if the CME Gateway fails.</p> <p>After reconnecting to the CME Group in this manner, traders have no access to their current working state or position in the market (i.e., historical information). This information remains on the failed TT Gateway in its log and table files.</p>
	<p><b>Note:</b> If you intend on installing secondary CME Gateways for disaster recovery purposes, traders must use unique Member IDs when logging into the different TT Gateways. This is a CME Group restriction. For example, if trader Jim wants access to the exchange through <b>CME -A</b> and <b>CME-B</b>, he must have a Member ID for <b>CME-A</b> and a different Member ID for <b>CME-B</b>. In this manner, his login on each TT Gateway is different.</p>
<b>Gateway Failover Behavior</b>	<p>After a trader closes and then reopens X_TRADER<sup>®</sup> and then logs into the alternate CME Gateway, the TT system exhibits the following behavior:</p> <ul style="list-style-type: none"> <li>• <b>Fills:</b> X_TRADER<sup>®</sup> does not have access to any fills that occurred previous to the trader connecting to the secondary CME Gateway because the *.bof files do not hold the fills for the new trader.</li> <li>• <b>Orders:</b> After traders reconnect, they can submit orders. However, they do not have access to any active orders that were in the market at the time of the previous connection being lost. This information is on the failed TT Gateway.</li> </ul>
<b>Secondary Gateway Recovery: Software</b>	<p>Refer to the section called <b>Single Gateway Failure</b> on page 111 for details on CME Gateway software recovery.</p>
<b>Secondary Gateway Recovery: Hardware</b>	<p>Refer to the section called <b>Single Gateway Failure</b> on page 111 for details on CME Gateway hardware recovery.</p>
<b>Example 2: Unsuccessful Failover</b>	<p>Having recovered from the hard drive crash in the previous <b>Example Scenario 1 – Single</b> CME Gateway, Quick Financial Services (QFS) now has two CME Gateways (referred to as A and B) conforming to the setup criteria for Redundant CME Gateways. During the day, the exchange connections on gateway A fail. Gateway A immediately loses its connection to the exchange and shuts down. All traders on gateway A lose their connection to the exchange and gateway A displays as red in Guardian across the network. Prices become stale, traders stop receiving fills, and they are unable to trade.</p> <p>Jim first documents his position. With his documented position in hand, Jim calls CME Group and cancels all outstanding orders. He then closes X_TRADER<sup>®</sup>, reopens it, and logs into gateway B to continue trading. Jim already has previously saved workspace on this gateway and is not prompted to convert.</p>



When Jim logs into gateway B, none of his fills or orders refresh. He does not have access to his historical fills. He resumes trading.

The IT staff at QFS restarts gateway A. Traders can begin logging into gateway A, and trading continues as normal. However, if a trader submits orders on gateway B, then logs off B and into gateway A, that trader does not have access to trading activity (orders and fills) managed by gateway B.

---

**Example 3:  
Unsuccessful Failover**

QFS has two TT Gateways (called A and B) with 40 traders – 20 traders on each gateway. During trading hours, software on gateway A fails. All 20 traders using that gateway begin logging into gateway B. However, trading is particularly heavy that day and the software on gateway B begins experiencing noticeable latency.

To resolve this situation (latency caused by heavy volume) from occurring in the future, QFS calls CME Group and orders three more SLE configuration connections. QFS also calls TT for installation of three additional TT Gateways. This provides better failover and supports future growth of the company.

## Exchange Host Failure and Recovery

<b>Overview</b>	<p>Several types of failures can occur between the customer's network and the exchange. Such failures can involve network devices, the CME Group price and order environments, and the exchange matching exchange. Of these failures, this section discusses three primary types:</p> <ul style="list-style-type: none"> <li>• Exchange Host Failure</li> <li>• MDP Server Failure</li> <li>• MDP Price Delivery Failure</li> <li>• iLink Server Failure</li> </ul>
<b>Exchange Host Failure</b>	<p>In the event that only the CME Group exchange host fails, all traders on the TT System experience the following:</p> <ul style="list-style-type: none"> <li>• Orders: CME Group rejects all submitted orders.</li> <li>• Prices: Prices go stale.</li> </ul> <p>However, the TT Gateway continues to run and remains connected to the CME Group's iLink and MDP servers.</p> <p>When the exchange host again goes live, the TT Gateway receives the appropriate fix messages. Traders can again begin trading normally and prices begin updating as normal.</p>
<b>MDP Server Failure</b>	<p>When an MDP server fails in the CME Group's environment, any Price Servers connected to it shutdown after the number of seconds set in the <code>HeartbeatTimeout</code> parameter of the <code>[price_session]</code> section in the <b>hostinfo.cfg</b> file. These Price Servers appear red (inactive) in Guardian. During the MDP server failure, all prices remain stale.</p>
<b>MDP Price Delivery Failure</b>	<p>This section highlights gateway behavior during price transmission failure. The CME Group provides price data along two separate yet identical feeds. The data packets are transmitted with sequence numbers to help identify missing packets. If the TT Gateway discovers a missing sequence number, the Price Server updates with correct information after receiving the next price update.</p> <p>When waiting for the next price update, the CME Gateway may temporarily remove market data. This information automatically repopulates when a new price update is received.</p> <p>You must verify that the price feeds are receiving data. For further information, refer to the section called <b>Verifying Connectivity</b> on page 43.</p>
<b>iLink Server Failure</b>	<p>When a CME Group iLink Server fails, all Order Routers that connect to that server lose their connections. Normally, the Order Routers on the TT Gateway cycle to the backup iLink server whose connection information is included in the <b>hostinfo.cfg</b> file.</p> <p>However, in the case that both iLink servers fail, Order Routers on the CME Gateway begin cycling by attempting to connect first to the Primary and then to the Backup IP addresses listed in the <b>hostinfo.cfg</b> file.</p> <p>The CME Group exchange host may or may not retain orders that reached the exchange prior to the failure. Traders must call CME Group for an accurate accounting of their orders.</p> <p>For details on Order Router cycling and recovery, refer to the section called <b>Gateway Recovery: Order Routers</b> on page 111.</p>

## CME Group Recovery Processes

Depending upon the particular type of failure, the following items occur (reconnection does not occur in any particular order):

- If the MDP server failed, the Price Server on the CME Gateway reconnects to the CME Group exchange host. Prices go live again.
- If the iLink Server failed, the Order Routers on the CME Gateway reconnect to the CME Group exchange host. Traders can now trade.
- Fills: Unless fills were dropped by CME Group, traders have access to their fills for the entire trading day. Traders see their fills for the day re-downloading.
- Orders: Due to the possibility of orders being dropped by CME Group during an iLink server or CME Group exchange host crash, traders must call the exchange and verify their working orders.
- Position: Because the CME Group exchange host may drop fills or orders during a failure, upon reconnection, traders may have incorrectly calculated positions. To determine correct positions, traders must call CME Group and inquire upon all orders in their Order Book.

Additionally, in a crash situation it is possible that Cancel on Disconnect functionality can cause stale orders. Traders should inquire on their orders with the CME Group to verify the accuracy of all information.



**Warning:** If the Cancel on Disconnect functionality creates stale orders, they will be deleted from the Order Book if inquired in X\_TRADER® using the **Inq** button in the Order book.

If you subscribe to CME Group's Cancel on Disconnect functionality, recovery occurs as described in the section called **Cancel on Disconnect** on page 118.

## Cancel on Disconnect

CME Gateways support the exchange's Cancel on Disconnect functionality. To enable this functionality, you must subscribe for the free service through the Globex Control Center (GCC). The exchange enables this functionality based on registered session ID and trader ID pairs.

The Cancel on Disconnect service monitors for involuntary disconnects. Once CME Group detects a disconnect, the exchange cancels all day orders except for GTDate and GTC orders.

In certain situations, some orders may not be cancelled by the exchange. Following a disconnect, customers should contact the GCC to determine their correct positions and inquire on all orders in their order book.

**Note:** For more information on the CME Group's Cancel on Disconnect functionality, refer to <http://www.cmegroup.com/globex/files/CancelOnDisconnect.pdf>.



## Using Connection Quality Tools

### Overview

For the MDP connection, the CME Gateway receives FIX/FAST messages via two connections labeled Feed A and Feed B. The Connection Quality Tools help troubleshoot and prevent problems associated with downed or improperly connected feeds.

There are two Connection Quality Tools available:

- TT FAST Tester - quickly checks the standard MDP connection (Feeds A and B) between the CME Gateway and the exchange.
- TT Bandwidth Tester - checks the standard MDP connection (Feed A and B) for packet loss and latency.

### Before You Begin

You can start the TT FAST Tester and TT Bandwidth Tester by double-clicking the executable file (.exe.) located in the **<root drive>:tt\Exchange-Flavor** directory. The filenames are **tt\_fast\_tester.exe** and **tt\_fast\_bandwidth.exe**. Before starting each test, you must edit the following in the **hostinfo.cfg** file:

- Configure the [price\_session] section with your custom connection values.
- Add the CME Group-facing NIC to each NetworkInterface parameter.
- Create a copy of the hostinfo.cfg file with the name **CMEHostinfo.cfg**. The TT FAST Tester and TT Bandwidth Tester use the settings in this file to verify connectivity.

### Executing the Tests

The TT FAST Tester runs a test for each channel along the NIC (Network Interface Card) defined in the hostinfo.cfg file. The utility checks the heartbeat the exchange sends at least every 60 seconds. Therefore, each channel test may take up to 65 seconds. For more info on Heartbeating, refer to "Aconfig and Environment Setup" in the *TT Gateways Architecture System Administration Manual Version 7.X*.

In addition to testing the overall status of the connection, the TT Bandwidth Tester also checks for packet loss and packet latency. Due to the extensive nature of this test, the utility runs for approximately one hour. If stopped before completion, the utility can fail to create a proper log file.

To run a test, double-click its executable. Once complete, the MDP Quality Tools create the log files **tt\_fast\_tester.out** and **tt\_fast\_bandwidth.out** in the **<root drive>:tt\logfiles** directory.

### TT FAST Tester Results

The following illustrates the results the TT FAST Tester writes to the **tt\_fast\_tester.out** logfile:

#### ► To interpret the TT FAST Tester results:

1. The utility prints out information regarding which NICs (Network Interface Cards) it tests.

#### Example:

```
Interface: feeda using 172.20.16.210
Interface: feedb using 172.20.28.138
```



- The utility then prints the IP address of each test channel and returns a PASSED or FAILED message.

**Example:**

```
Run test for subject: CME_GLOBEX_MO_MESSAGES
  Run Test For 233.119.160.1:10001 on Interface 172.20.16.210
  Run Test For 233.119.160.65:100065 on Interface 172.20.28.138
  . PASSED
Run test for subject: CME_ADMIN_CHANNEL
  Run Test For 233.119.160.2:10002 on Interface 172.20.16.210
  Run Test For 233.119.160.66:100066 on Interface 172.20.28.138
  ..... PASSED
```

- The utility produces a FAILED test result when one of the following occurs:
  - A problem exists with the NetworkInterface parameter setting in the hostinfo.cfg file.
  - Inability to connect to the exchange.
  - No heartbeat received within 65 seconds.

**Note:** If the test fails, TT suggests running the tool a second time with the -verbose option. This provides additional troubleshooting information.

---

**TT Bandwidth Tester Results**

The following illustrates the results the TT Bandwidth Tester writes to the **tt\_fast\_bandwidth.out** logfile:

► **To interpret the TT Bandwidth Tester results:**

- The utility lists the MDP interfaces and IP addresses it listens to:

**Example:**

```
Create listener for 233.119.160.2:10002 on 172.20.16.210
Create listener for 233.119.160.66:10066 on 172.20.28.138
Create listener for 233.119.160.20:10020 on 172.20.16.210
Create listener for 233.119.160.84:10084 on 172.20.28.138
```

- The utility calculates the normalized time difference between packets on the MDP feed and the machine itself. Ideally, these latencies should be close to zero.
- The utility prints out information on dropped and delayed packets. A delayed packet arrives 100 milliseconds later or more.

**Example:**

```
[2007-07-25 16:29:26.295]: CME_EQ_FUTURES: 233.119.160.142:10142:
Sequence: 429651 Packet Latency: 100ms
[2007-07-25 16:29:26.295]: CME_EQ_FUTURES: 233.119.160.142:10142:
Sequence: 429652 Packet Latency: 102ms
[2007-07-25 16:29:26.295]: CME_EQ_FUTURES: 233.119.160.142:10142:
Sequence: 429661 Packet Latency: 102ms
[2007-07-25 16:29:26.295]: CME_EQ_FUTURES: 233.119.160.206:10206:
Sequence: 429651 Packet Latency: 102ms
```

- At the end of the test, the utility prints a test results summary that shows the number of dropped and lost packets.

**Example:**

```

Statistics for: CME_EQ_FUTURES
Address 233.119.160.142:10142 on 172.17.117.101:
  Received: 46
  Dropped: 10
  Address Percent Loss: 17.86%
Address 233.119.160.206:10206 on 172.17.117.101:
  Received: 48
  Dropped: 8
  Address Percent Loss: 14.29%
Packets Not Received By Any Interface: 8
Subject Percent Loss: 14.81%

```

**Order Messaging Volume Controls**

The CME Group sets messaging volume thresholds at the iLink session level to monitor and control excessive new order and cancel/replace messaging. The automated controls are designed to prevent latencies and support valid trading. The current threshold is 750 MPS. The volume threshold for order cancel is 1,000 MPS.

**Note:** If an iLink session exceeds the threshold over a rolling three-second window, the following error will be displayed in the X\_TRADER® Audit Trail window:

```
Volume Controls Initiated Reject. Current TPS:nnn
```

Where: nnn is the current messaging rate in transactions (messages) per second.

If you receive this message from the CME Group, there are no actions to take concerning the CME Gateway. However, you should be aware that subsequent new order and cancel/replace messages will be rejected by the exchange until the average MPS rate falls below the threshold.

## Common Issues

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### Market Data Issues

The following lists common problems with market data management and possible solutions:

- I do not see any market data populating in X\_TRADER®.
  - Verify connectivity to the exchange.
  - Telnet the Price Server connection IP address to ensure that the CME Gateway is connected to the exchange. Contact the exchange to obtain this IP address.
- I do not see prices for a particular contract.
  - The Price Server receives market data only for subscribed products.
  - Ensure that the product is listed in the hostinfo.cfg file.

---

### Connection Issues

The following lists common connection problems and possible solutions:

- I can telnet the exchange; however, the CME Gateway fails to connect.
  - Verify your connection IDs.
  - You must obtain unique order and price connection IDs from the exchange.
- The Price Server and/or Order Server does not connect to the exchange.
  - You must obtain a unique set of connection information for the Order Server.
  - Obtain a unique set of connection information for the Price Server.

**FASTTemplate.xml  
Issues**

The following issues are related to using the incorrect version of the **FASTTemplate.xml** file:

- Price freezing or latency within the market depth for a product in X\_TRADER®.

If this occurs, it may cause the Bid and Offer Volume within the market depth for a particular product to disappear or flicker intermittently for brief moments at a time. You also may notice this occurring at the same time every day.

- Missing products in the X\_TRADER® **Market Explorer** window.
- Autospreader orders are deleted for no reason.

In the Audit Trail or Audit Log at the time the orders are deleted, you may see the following reject message: `Quoting against an Illiquid Market`. If you receive this message and there is normally a liquid market for the product you are trading, then it's likely that the **FASTTemplate.xml** file has not been updated on the CME Gateway.

To address these issues, refer to the section called **Checking the FASTTemplates.xml Version** on page 53.





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**Overview**

The CME Gateway uses `hostinfo.cfg` (located in `<root directory>:\tt\config`) to configure its connection parameters and behavior. If this file is not configured or used properly, the CME Gateway will not function correctly. You must configure the `hostinfo.cfg` file at the time of installation, and again later, if any changes are made to network setup or trader logon IDs.

The default **hostinfo.cfg** on CME Gateways includes the following sections that contain parameters which affect the behavior of the CME Gateway:

- `[order_session_#]`: The Order Server on the CME Gateway uses this section to configure an order session with CME Group. Additionally, this section has two optional parameters to set the deletion of stale orders from the order book.
- `[price_session]`: The Price Server on the CME Gateway uses this section to configure a price session with the CME Group.

**Hostinfo.cfg** may have lines that begin with the “#” symbol. These lines are informative and do not configure program behavior.

When editing configuration files (.cfg), each logical set or entry must have its own line.

---

**Deprecated Parameters**

This section lists all deprecated parameters:

- The following parameters are no longer valid in **hostinfo.cfg**.
  - From `[order_session]`: `BridgePath`, `LogFile`, `ForceSendRecvFlush`, `Username`, `Holdlistsize`, `Outwindowsize`, `FFT4`, `LogAllOrdersAndFills`, `iLinkBackupIP`, `iLinkBackupPort`, `nopriceapi`
  - From `[price_session]`: `Password`, `ExchangeImplieds`, `PricePersistence`, `RequestHistory`, `ReplayAddress`, and `ReplayHost`
- The following parameters are no longer valid. Additionally, the CME Gateway reflects the following default behaviors:
  - `Implieddepth`: CME Gateways support implied depth.
  - `Marketdepth`: CME Gateways forward all levels of depth available from the exchange.
  - `Theoreticalopening`: CME Gateways forward theoretical prices.
  - `Quoterequest`: CME Gateways process and distribute incoming Request for Quote (RFQ) messages.
  - `Persistent`: CME Gateways persist connections to the exchange.
  - `PriceFeed=FAST`: CME Gateways subscribe to and process market data in FIX/FAST format.

---

**Section: [order\_session]**

The Order Server uses this section to configure an order session with CME Group. For each order session that the Order Server maintains, you must include a `[order_session_#]` section. Additional sections configure an Order Server on the CME Gateway to host multiple CME Group memberships.

You must assign each section a unique name using the # part of the name. For example, if you have two sections in your **hostinfo.cfg**, you could simply name them:

- [order\_session\_1]
- [order\_session\_2]


The first section in **hostinfo.cfg** does not include the `_#` identifier.

Whenever a trader submits an order, that trader's Member ID determines which order session carries the order. The Member ID maps to the order session's member parameter.

The table below includes the parameters that you use with the [order\_session\_#] section. Default values are included when applicable.



**Warning:** You must cancel all working orders before altering or removing any iLink session information. Failure to do so can result in orders becoming lost or deleted from the CME Gateway.

Parameter	Description
[order_session_#]	This is the section title, where # uniquely identifies the order session.
Member=SessionIDFirmID	<p>Also called the Member ID. This is a concatenation of the customer's FirmID and SessionID, both of which CME Group assigns to the customer. This parameter has only six alphanumeric characters.</p> <p>Each [order_session_#] section must have a unique Member parameter.</p> <p> <b>Warning:</b> If there is a duplicate <code>Member</code> parameter configured on a multi-session CME Gateway, the Order Server will not start.</p>
Password	CME Group assigns this value to the customer and refers to it as the Password.
ILinkPrimaryIP	The exchange refers to this value as the IP address. The exchange provides the IP address, which is an IP address for a CME Group FIX Server through which the customer can connect to the exchange. The customer must use one of these addresses for the PrimaryIP.
ILinkPrimaryPort	The exchange refers to this value as the port. This is the port on the CME Group FIX Server which the TT Gateway connects. If the exchange provides two port numbers, CME Group assigns each port to a specific IP address. If this is the case, the customer must use the appropriate number for each of the port parameters.

**Table 4. [order\_session\_#] section parameters**

Parameter	Description
A1=40 G1=30 G2=40 M1=10 M2=21 P1=10 P2=21 U1=10	<p>These values set the associated CTI/Origin values for all orders that get sent through the order session.</p> <p>The first digit of the value (e.g., for A1 listed on the left, this is 4) is the CTI value and the second digit is the origin value (origin of the order or fill). For example, if a parameter has a value of 41, it has a CTI value of 4 and an Origin value of 1.</p> <p>If you change CTI/Origin mappings, you must stop and restart the Order Server before those particular mappings become active.</p> <p>The accounts are:</p> <ul style="list-style-type: none"> <li>• A1 = 1st Agent</li> <li>• G1 = 1st giveup</li> <li>• G2 = 2nd giveup</li> <li>• M1 = 1st market maker</li> <li>• M2 = 2nd market maker</li> <li>• P1 = 1st proprietary</li> <li>• P2 = 2nd proprietary</li> <li>• U1 = Unallocated</li> </ul> <p>The associated numeric values for CTI are:</p> <ul style="list-style-type: none"> <li>• 1: Member Trader</li> <li>• 2: Proprietary</li> <li>• 3: On Behalf of Other Traders</li> <li>• 4: Customers</li> </ul> <p>The associated numeric values for Origin are:</p> <ul style="list-style-type: none"> <li>• 0: Customer</li> <li>• 1: Firm or House (Non-customer)</li> </ul>
GiveupAccounts	<p>Sets whether orders that carry the specified account type (i.e., G1) have multiple Give Up accounts. If X_TRADER® submits an order with the specified account type, the CME Gateway does not send a give-up firm. The CME Group assumes that the order is given up to multiple firms. Mapping is taken care of by CME Group’s back end.</p> <p>For a description of configuring Give Up orders, refer to the section called <b>MultiFirm Give Up Orders</b> on page 107.</p>

**Table 4. [order\_session\_#] section parameters**



Parameter	Description
Sendersubid=	<p>Configures how the CME Gateway populates FIX Tag 50 for orders sent to the exchange. Tag 50 is used by the exchange to identify traders within the network.</p> <p>For New, Change, or Cancel Orders, and RFQs, the CME Gateway populates Tag 50 based on the FIX Adapter <code>Sendersubid</code> parameter. However, if the FIX Adapter <code>Sendersubid</code> value is blank, the CME Gateway populates Tag 50 based on the CME Gateway <code>Sendersubid</code> value.</p> <p>Set this parameter to one of the following values:</p> <ul style="list-style-type: none"> <li>• <i>Exchange:</i> Configures the CME Gateway to populate Tag 50 with the Direct Trader ID (i.e., the "Trader" ID part of the <b>MemberGroupTrader</b> ID) and send it to the exchange for all orders.</li> <li>• <i>Username:</i> Configures the CME Gateway to populate Tag 50 with the TT Username (i.e., the Universal Login ID defined in TT User Setup). If this ID value is not present, the CME Gateway checks for a TTORD Trader ID and maps it to Tag 50. However, if neither of these values is present in Username mode, the CME Gateway populates Tag 50 with the Trader ID part of the Direct Trader ID and sends it to the exchange.</li> <li>• <i>Retail:</i> Configures the CME Gateway to populate Tag 50 with the TT Username (i.e., the Universal Login ID defined in TT User Setup). However, if this ID value is not present in Retail mode, the CME Gateway populates Tag 50 with the Trader ID part of the Direct Trader ID and sends it to the exchange. When set to Retail, the CME Gateway never populates Tag 50 with a TTORD Trader ID.</li> <li>• <i>TTORD:</i> Configures the CME Gateway to populate Tag 50 with the TTORD Trader ID. If this ID value is not present in TTORD mode, the CME Gateway populates Tag 50 with the Trader ID part of the Direct Trader ID and sends it to the exchange.</li> </ul> <p>By default for CME Gateway 7.16, this parameter is not present and the Gateway behaves as if set to <i>Username</i>.</p> <p>By default for gateway 7.15, this parameter is not present and the gateway behaves as if set to <i>Exchange</i>. When configuring this parameter, the Trader ID part of the Direct and TTORD <b>MemberGroupTrader</b> IDs must be unique.</p> <p>Related Tag 49 (SenderCompID) equals a concatenation of the Session and Firm IDs provided in <b>hostinfo.cfg</b> file with a fault tolerance indicator (Primary, Backup, Undefined).</p> <p>Tag 49 is not configurable beyond setting the Session and Firm IDs.</p> <p><b>Warning:</b> Tag 50 can only contain a maximum of 32 characters. The exchange rejects any order that contains a value greater than 32 characters in Tag 50.</p>

Table 4. [order\_session\_#] section parameters

**Example:**  
[order\_session\_#]

The following example sections illustrate:

## A Configuration Parameters

- A hostinfo.cfg configured for one membership
- A hostinfo.cfg configured for two memberships

Example HostInfo.cfg File - One Member	Example HostInfo.cfg File - Two Members
<pre>[order_session_1] Member=TR409 Password=TR4 iLinkPrimaryIP=10.140.120.45 iLinkPrimaryPort=11092 A1=40 G1=30 G2=40 M1=10 M2=21 P1=10 P2=21 U1=10</pre>	<pre>[order_session_1] Member=TR409 Password=TR4 iLinkPrimaryIP=10.140.120.45 iLinkPrimaryPort=11092 A1=40 G1=30 G2=40 M1=10 M2=21 P1=10 P2=21 U1=10  [order_session_2] Member=TR408 Password=TR5 iLinkPrimaryIP=10.140.120.45 iLinkPrimaryPort=11092 A1=40 G1=30 G2=40 M1=10 M2=21 P1=10 P2=21 U1=10</pre>

**Table 5. Example [order\_session\_#] sections**

**Section: [price\_session]** The [price\_session] section configures the Price Server connection to CME Group and lists the various subjects for which the Price Server subscribes. Parameters that are not present by default can be added manually to this section using a text editor (e.g., Notepad). The [price\_session] section consists of the following parameters:

Parameter	Description
[price_session]	This is the section title.
OptionStrategies=Y	<p>Sets whether the CME Gateway supports trading of options strategies, user-defined strategies, and exchange-defined strategies.</p> <p>This parameter has two settings:</p> <ul style="list-style-type: none"> <li>• <b>Y</b>: The CME Gateway supports trading of options strategies, user-defined strategies, and exchange-defined strategies.</li> <li>• <b>N</b>: The CME Gateway does not support trading of options strategies, user-defined strategies, and exchange-defined strategies.</li> </ul> <p>When this parameter is set to <b>Y</b>, any new or existing options strategy, User-Defined Strategy (UDS) or Exchange-Defined Strategy (EDS) is made available for trading by the CME Gateway. When this parameter is set to <b>N</b>, no options strategy, user-defined or exchange-defined strategy is processed by the CME Gateway; however, you can still create a User-Defined-Strategy if this parameter is set to <b>N</b>.</p> <p>Leaving this parameter set to <b>Y</b> when you do not use strategies is not detrimental to the CME Gateway. By default, this parameter is present and is set to <b>Y</b>.</p>
MulticastConfig	<p>For 7.16.0 or higher versions, sets the relative path to the TT configuration directory (\config) and <b>fast.cfg</b>. The path to the directory can be changed to a customized location relative to \config by entering and configuring this parameter. By default, this parameter is not present and the gateway automatically locates <b>fast.cfg</b> in the \config directory.</p>

**Table 6. [price\_session] section parameters**


Parameter	Description
MaxSubjects=	<p>Sets the maximum number of product channels to subscribe to on the price feed, and overrides the CME Gateway default channel limit. TT highly recommends subscribing to no more than 14 channels per gateway, however, certain channels do not experience the same trading volume and can be added beyond the 14-channel limit without introducing latency or negatively impacting system performance. For more information about optimizing your gateway, refer to the section called <b>Recommendations for Optimal Performance</b> on page 70.</p> <p>If your gateway experiences dropped packets or price latencies after enabling the <code>MaxSubjects</code> functionality, remove this parameter and reconfigure your price subscriptions. If you contact TT about price latency/stability issues after setting this parameter, you will be instructed to remove this parameter and lower the number of channels as the first debugging step.</p> <p>By default, this parameter is not present and the CME Gateway subscribes to a maximum of 14 product channels.</p> <p><b>Note:</b> TT highly recommends that you work with your TAM to determine if your gateway configuration can reasonably process additional channels above the 14-channel limit.</p>
ProcessDailies	<p>Sets whether the Price Server processes daily Futures contracts available on the following market data channels: GREEN_EXCHANGE_FUTURES and NYMEX_FAST_NATURALGAS_PROPANE.</p> <p>The parameter has two settings:</p> <ul style="list-style-type: none"> <li>• <b>Y:</b> the Price Server processes daily contracts on these channels.</li> <li>• <b>N:</b> the Price Server does not process daily contracts on these channels.</li> </ul> <p>If <code>ProcessDailies=Y</code>, the <code>FASTSubject#</code> parameters for GREEN_EXCHANGE_FUTURES and/or NYMEX_FAST_NATURALGAS_PROPANE must be enabled.</p> <p>By default, this parameter is not present and the CME Gateway behaves as if set to <b>N</b>.</p> <p><b>Note:</b> If <code>ProcessDailies=Y</code>, any FIX Adapter, X_TRADER® API, or Back Office Bridge users in your environment must upgrade to the following versions in order to support daily Futures contracts:</p> <ul style="list-style-type: none"> <li>• FIX Adapter 7.7.4</li> <li>• X_TRADER API 7.7.6</li> <li>• Back Office Bridge 3.2.2</li> </ul>

Table 6. [price\_session] section parameters



Parameter	Description
<code>ignoregroupcode=</code>	<p>Sets the CME Group's group codes (comma delimited) for products that the TT Gateway ignores. Contact the CME Group for a current list of group codes.</p> <p>In order to trade Eurodollar options, you must:</p> <ul style="list-style-type: none"> <li>• uncomment this parameter by removing the # sign, if present</li> <li>• set <code>ignoregroupcode=none</code></li> </ul> <p><b>Note:</b> The <code>productgroupingfilter</code> parameter overrides this setting.</p>
<code>ProductGroupingFilter</code>	<p>Sets which products to include or exclude from the price feed based on the <code>EnableOrDisableGroups</code> parameter. Products must follow the format set in the <b>productgroupings.cfg</b> file.</p> <p>By default, this parameter is not present and the CME Gateway subscribes to all products except those listed in the <code>ignoregroupcode</code> parameter.</p>
<code>EnableOrDisableGroupings=enabled</code>	<p>If the value equals <code>enabled</code>, the price feed includes products listed in the <code>productgroupingfilter</code> parameter. If the value does not equal <code>enabled</code>, all products listed in the <code>productgroupingfilter</code> parameter are excluded from the price feed.</p> <p>By default, this parameter is not present and the CME Gateway subscribes to all products except those listed in the <code>ignoregroupcode</code> parameter.</p> <p><b>Note:</b> This parameter only functions when values are set in the <code>productgroupingfilter</code> parameter and the <b>productgroupings.cfg</b> file is present.</p>
<code>MaxSnapshotQueue</code>	<p>Set the number of messages the CME Gateway stores when awaiting a market snapshot from the CME Group.</p> <p>By default, this parameter is not present and the CME Gateway behaves as if <code>MaxSnapshotQueue=300</code>.</p> <p><b>Note:</b> This parameter is only available in FIX/FAST mode.</p>
<code>TemplateFile</code>	<p>For 7.15.0 or lower versions, sets the location of the FASTTemplates.xml file. By default, CME Gateways set <code>TemplateFile=&lt;root drive&gt;\tt\config\FASTTemplates.xml</code>. If this parameter is present in <b>hostinfo.cfg</b> after an upgrade to a 7.16.0 or higher, the setting will be ignored.</p> <p>For information on how the CME Gateway uses the FASTTemplates.xml file, refer to the section called <b>FIX/FAST Behavior</b> on page 52.</p>

Table 6. [price\_session] section parameters

Parameter	Description
FastTemplates	<p>For 7.16.0 or higher versions, sets the location of the <b>FASTTemplates.xml</b> file. The path to the file can be changed to a customized location relative to the TT configuration directory (\config) by configuring this parameter. By default, this parameter is not present and the gateway automatically locates the <b>FASTTemplates.xml</b> file in the \config directory.</p> <p>For information on how the CME Gateway uses the FASTTemplates.xml file, refer to the section called <b>FIX/FAST Behavior</b> on page 52.</p>
FASTSubject#=Subject/	<p>Configures the type of data (i.e., products) to which the CME Gateway subscribes. You can subscribe to any market data that has a [fastInterface] section in the <b>fast.cfg</b> file.</p> <p>The value of this parameter must exactly match the value of a subject parameter in the <b>fast.cfg</b> file. The CME Gateway uses <b>fast.cfg</b> to determine how to connect to CME Group to subscribe to the specified data.</p> <p>The # in the FASTSubject# parameter starts at 1 for the first subject you include and increases by 1 for each additional subject parameter you include in this section. Each # must be unique.</p> <p>The Price Server limits subscribing to more than 14 FIX-FAST market data channels per CME Gateway. For recommendations on which combinations of subject parameters to enable in order to configure the CME Gateway for optimal performance, refer to the section called <b>Recommendations for Optimal Performance</b> on page 58.</p> <div style="border: 1px solid black; padding: 5px;"> <p> <b>Warning:</b> If the CME Gateway subscribes to more than 14 FIX-FAST market data channels, the Price Server immediately logs an error message and displays as Exchange Feed Down (half red, half green) in Guardian. If this occurs, you will need to adjust the number of FASTSubject# parameters enabled in the [price_session] section and restart the Price Server.</p> </div>
NetworkInterfaceFeed*=IP	<p>Sets the IP Address of the CME Group-facing NIC. If you use multiple CME Group-facing NICs, using Feed* you must specify which MDP feed the TT Gateway routes over the NIC. The Feed* section of this parameter maps to the same section in the parameter AddressFeed* in the fast.cfg file. If you have only one CME Group-facing NIC, use NetworkInterface=IP, the TT Gateway uses this as the default NIC for all MDP feeds.</p> <p>For further details and examples, refer to the section called <b>Configuring Multiple NIC Setup</b> on page 41.</p>

**Table 6.** [price\_session] section parameters



Parameter	Description
HeartbeatTimeout=150	<p>This value sets the number of seconds the Price Server continues to run without receiving any data and heartbeats. If the Price Server has not received data or heartbeats after this time has elapsed, it dies. During normal trading hours, TTChron restarts this process.</p> <p>During operation, if the Price Server loses its connection to the exchange and times out, it dies and then tries to reconnect after it is restarted.</p>
LogLinkInterval=1000	<p>Price data is sent from the CME Group and assigned sequence numbers (links). This parameter sets the number of links the TT Gateway bundles together.</p> <p>By default, this parameter is not present and the TT Gateway behaves as if this parameter is set to 1000.</p> <div data-bbox="971 740 1490 825">  <p><b>Warning:</b> Do not modify this setting unless instructed to do so by a TT Representative.</p> </div>
RequestProducts=N	<p>Sets whether the TT Gateway will request historical product data at startup from the CME Group.</p> <ul style="list-style-type: none"> <li>• <b>Y:</b> Historical product data is requested.</li> <li>• <b>N:</b> Historical product data is not requested.</li> </ul> <p>By default, this parameter is not present and the TT Gateway behaves as if this parameter is set to N.</p> <div data-bbox="971 1102 1490 1336">  <p><b>Warning:</b></p> <ul style="list-style-type: none"> <li>• Do not modify this setting unless instructed to do so by a TT Representative.</li> <li>• This parameter may be overridden by any command line parameters which start historical data requests.</li> </ul> </div>
IncludeSpreadTradesInVAP	<p>Sets whether the CME Gateway includes non-implied spread trades when calculating Volume at Price (VAP).</p> <p>This parameter has two settings:</p> <ul style="list-style-type: none"> <li>• <b>Y:</b> The Gateway includes non-implied spread trades when calculating VAP.</li> <li>• <b>N:</b> The Gateway does not include non-implied spread trades when calculating VAP.</li> </ul> <p>By default this parameter is not present. If this parameter is not present or contains an invalid value, the CME Gateway behaves as if set to <b>Y</b>.</p> <p>For a description on how the CME Gateway calculates VAP, TTQ, LTQ and LTP, refer to the section called <b>Configuring Total Traded Quantity at Price (VAP)</b> on page 61.</p>

Table 6. [price\_session] section parameters



Parameter	Description
IncludeSpreadTrades	<p>Sets whether the CME Gateway includes spread trades when calculating Last Traded Price (LTP) and Last Traded Quantity (LTQ),</p> <p>By default, this parameter is not present. If this parameter is not present or contains an invalid value, the CME Gateway behaves as if set to <b>N</b>.</p> <p>For a description on how the CME Gateway calculates VAP, TTQ, LTQ and LTP, refer to the section called <b>Configuring Total Traded Quantity at Price (VAP)</b> on page 61.</p>
LogSettlements	<p>Sets whether the Price Server logs settlement prices.</p> <p>When LogSettlements=<b>Y</b>, the Price Server logs all settlement prices.</p> <p>By default, this parameter is not present. If this parameter is missing or contains a value other than <b>Y</b>, the Price Server does not log settlements.</p> <p><b>Warning:</b> Do not modify this parameter unless instructed to do so by a TT Representative.</p>
RequestInitialSnapshot	<p>Sets whether the CME Gateway fills in market data by requesting a snapshot from the exchange or simply updating data as price updates arrive.</p> <p>This parameter has two available settings.</p> <ul style="list-style-type: none"> <li>• <b>Y:</b> After receiving an initial price update, the CME Gateway fills in market data by requesting a snapshot from the exchange.</li> <li>• <b>N:</b> After receiving an initial price update, the CME Gateway updates market data as subsequent price updates arrive (i.e., Natural Refresh).</li> </ul> <p>By default, this parameter is not present and the CME Gateway behaves as if RequestInitialSnapshot=<b>Y</b>.</p>
LogSnapshotProcessing	<p>Sets whether the CME Gateway forwards messages relating to missed packets to the X_TRADER® Audit Trail. These messages always result in a snapshot request in the Price Server log file.</p> <p>For missed packets, CME Gateways forward two messages:</p> <p>Requesting Snapshot For: &lt;contract&gt;</p> <p>Processing Snapshot For: &lt;contract&gt; where &lt;contract&gt; equals the contract name.</p> <p>This parameter has two available values:</p> <ul style="list-style-type: none"> <li>• <b>Y:</b> The CME Gateway forwards messages to the X_TRADER® Audit Trail.</li> <li>• <b>N:</b> The CME Gateway forwards messages to only the Price Server log file.</li> </ul> <p>By default, this parameter is not present and the CME Gateway behaves as if LogSnapshotProcessing=<b>N</b>.</p>

Table 6. [price\_session] section parameters



Parameter	Description
MaxSnapshotChannels	<p>Sets the maximum number of snapshot channels the Price Server can subscribe to at one time. Valid values are <b>0-n</b>, where <b>n</b> is the total number of channels configured on the price server. The default value is <b>2</b>.</p> <p>Enter a value less than or equal to the total number of channels being subscribed to by the price server.</p> <p>A value of <b>0</b> means that FIX/FAST message recovery is done via incremental updates only (no snapshot channels are opened by the Price Server.)</p> <p>By default, this parameter is not present and the CME Gateway behaves as if MaxSnapshotChannels=<b>2</b>.</p>
MaxInstrumentChannels	<p>Sets the maximum number of instrument definition channels the Price Server can subscribe to at one time. Valid values are <b>1-n</b>, where <b>n</b> is the total number of channels configured on the Price Server. The default value is <b>2</b>.</p> <p>Enter a value less than or equal to the total number of channels being subscribed to by the Price Server.</p> <p>By default, this parameter is not present and the CME Gateway behaves as if MaxInstrumentChannels=<b>2</b>.</p>
ProcessCoveredUDS	<p>Sets whether Covered User-Defined Strategy security definitions are downloaded to the price server from the exchange. Valid values are:</p> <ul style="list-style-type: none"> <li>• <b>ALL</b>: Allows the price server to download all Covered UDS security definitions from the exchange.</li> <li>• <b>SINGLE</b>: Configures the price server to download and process definitions only for Covered strategies with one outright futures leg. This is the default CME Gateway behavior.</li> <li>• <b>NONE</b>: Configures the price server to disregard all Covered UDS security definitions.</li> </ul> <p>By default, this parameter is not present and the gateway behaves as if ProcessCoveredUDS=<code>SINGLE</code></p>
LogUDSCreation	<p>Sets whether UDS Created and UDS Received messages are logged by the price server. Valid values are:</p> <ul style="list-style-type: none"> <li>• <b>Y</b>: Enables logging of these messages.</li> <li>• <b>N</b>: Disables logging of these messages.</li> </ul> <p>By default, this parameter is not present and the gateway behaves as if LogUDSCreation=<code>N</code></p>

Table 6. [price\_session] section parameters

## Section: [OrderServer]

Add the following section to define reconnect parameters for the Order Server.

Parameter	Description
[OrderServer]	Add this section to define the Order Server reconnect interval and reconnect attempts in the event of a disconnect with the exchange. This is an optional parameter. By default, this section is not present and the Order Server behaves as if <code>MaxReconnectAttempts</code> is set to 5, and <code>ReconnectInterval</code> is set to 16 seconds.
<code>MaxReconnectAttempts</code>	An optional parameter that defines the maximum number of times the Order Server will attempt to reconnect with the exchange host in the event of a disconnect. The minimum recommended value to enter is "5." By default, this parameter is not present and the Order Server behaves as if <code>MaxReconnectAttempts</code> is set to 5.
<code>ReconnectInterval</code>	An optional parameter that defines the length of time in seconds the Order Server will attempt to reconnect with the exchange host if the event of a disconnect. The minimum recommended value to enter is "15." By default, this parameter is not present and the Order Server behaves as if <code>ReconnectInterval</code> is set to 16.

**Table 7. [price\_session] section parameters**

## GAL Settings

### Overview

CME Gateways check only one GAL Setting: `Last-Traded-Quantity`, and by default, if this setting is missing or holds an incorrect value, the TT Gateway behaves as if set to 1.

For the other types of behavior (normally configured by the GAL Settings `Implicit-Spread-Prices` and `Implicit-Outright-Prices`), CME Gateways do not refer to the GAL Settings configured in `aconfig_local.xml`. For these behaviors, CME Gateways always behave as if set to 0, no matter what value you set in the GAL Setting in `aconfig_local.xml`.

For further details on GAL Settings and their associated behaviors, refer to the *TT Gateway Architecture SAM Version 7.X*.

### Default GAL Setting Values

The following table lists the default GAL Setting behaviors for the CME Gateway.

GAL Setting	Default Value
Last-Traded-Quantity	CME Gateways install with this value equal to 1.
Implicit-Outright-Prices	CME Gateways always behave as if this parameter is set to 0.
Implicit-Spread-Prices	CME Gateways always behave as if this parameter is set to 0.

**Table 8. GAL Settings**

# Send Us Your Comments

## CME Gateway System Administration Manual

### 7.X DV1

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