Celoxica
pure acceleration

Generic Market ACcelerator GMAC

Configuration Guide

About This Document

This document describes the GMAC configuration guide.

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Revisions

Revision	Date	Description of Changes
R2013-1.3	28 FEB 2013	Release R2013-1.2 - Added plugin BIT_MIL - Added plugin OSLO_MIL
R2013-1.2	19 FEB 2013	Release R2013-1.2 - Added plugin TURQUOISE_MIL - Added config.gmac.markets.market.trades-enabled to NYSE
R2013-1.1	13 FEB 2013	Release R2013-1.1 - Updated details to config.gmac.hardware-filtering
R2013-1.0	29 JAN2013	Release R2013-1.0 - Added details to config.gmac.hardware-filtering - Added plugin XDPUS
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R2012-8.1	20 DEC 2012	Release R2012-8.1 - Added details related to hardware symbol filtering when configuring channels (see config.gmac.markets.market.channels.channel) - Removed Terminology section (refer to GMAC Product Overview)
R2012-8.0	29 NOV 2012	Release R2012-8.0 - Added plugin EUREX_MDI - Added plugin EUREX_EMDI - Added plugin PICO_RF - Added config.gmac.fast-decoding - Added config.gmac.markets.market.fast-decoding - Added config.gmac.markets.market.socket-backoff-period-s
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R2012-7.1	30 OCT 2012	Release R2012-7.1 - Updated config.gmac.markets.market.task-time-ms-to-live and config.gmac.markets.market.task-time-ms-to-retry descriptions - Added config.gmac.markets.market.task-number-of-retries
R2012-7.0	09 OCT 2012	Release R2012-7.0 - Added plugin PHLXTOPOPLUS - Added plugin ISE_MDI_BINARY - Added config.gmac.markets.market.source-message-logfile to ICAP_XML
R2012-6.3	25 SEP 2012	Release R2012-6.3 - Added plugin ITCH_BROKERTEC - Updated DMA queue definition in section Terminology - Updated section Configuring Multiple Queues

Revision	Date	Description of Changes
		- Updated parameter numQueue definition in section Standard Multicast Channel Settings and Standard Recovery Channel Settings
R2012-6.2	12 SEP 2012	Release R2012-6.2 - Added config.gmac.markets.market.snapshots.channel to CME2
R2012-6.0	17 AUG 2012	Release R2012-6.0 - Added config.gmac.ade-dump-on-payload-error (DMA Buffer Dumping) - Added config.gmac.ade-dump-file-name (DMA Buffer Dumping) - Added config.gmac.ade-dump-max-interval-us (DMA Buffer Dumping) - Added config.gmac.ade-dump-max-packets (DMA Buffer Dumping) - Added plugin PHLXTOPOV3 - Added plugin OPRA_BINARY
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R2012-5.0	10 JUL 2012	Release R2012-5.0 - Added config.gmac.register-affinity - Added config.gmac.other-affinity - Added config.gmac.register-directory - Added config.gmac.register-no-sigabrt - Added config.gmac.reissue-subscriptions - Added config.gmac.send-multicast-timeout-messages - Added config.gmac.markets.market.socket-max-retries - Added config.gmac.markets.market.socket-max-retries-us - Added config.gmac.markets.market.task-time-ms-to-retry to ITCH 4.1 - Added plugin ICAP_XML - Added plugin BME
R2012-4.2	05 JUN 2012	Release R2012-4.2 - Added config.gmac.markets.market.exchange-timestamp to ARCA_XDP
2.2	25 MAY 2012	Release R2012-4.0 - Chi-X UDP is removed - Snapshot channels are now only configured using config.gmac.markets.market.snapshots.channel for all relevant plug-ins - Snapshot recovery is now only enabled using config.gmac.markets.market.snapshot-enabled for all relevant plug-ins - Added config.gmac.print-absent-fields - Updated symbol reference file location for ARCA_XDP - NYSE Amex is renamed NYSE MKT - Added details regarding the timeouts configuration
2.1	20 APR 2012	Release R2012-3.1 - Added configuration for XETRA
2.0	22 FEB 2012	- New template

Revision	Date	Description of Changes
		- Added config.gmac.hardware-filtering - Added config.gmac.markets.market.hardware-filtering - Added config.gmac.markets.market.preferred-interface to EUREX - Added config.gmac.markets.market.extension-messages to LSE Millennium - Added config.gmac.markets.market/refresh-enabled and config.gmac.markets.market.snapshots.channel to BATS - Added note regarding hardware filtering to ITCH 4.1 - Updated section EUREX / config.gmac.markets.market.preferred-channel: addition of value P for parameter prefChan - Updated section LIFFE XDP / config.gmac.markets.market.channels.channel: addition of parameter chanType - Updated section LIFFE XDP / config.gmac.markets.market.recovery.channel: addition of a note for parameter svcID - Updated section LIFFE XDP / config.gmac.markets.market.symbol-ref-file: addition of an example script - Updated section config.gmac.markets.market.channels.channel: a particular interface on a VLAN can be specified - Updated section config.gmac.markets.market.time-zone - Updated section ICE / config.gmac.markets.market.tcp_server: addition of tcp-recovery-enabled - Removed sections related to plugins Chi-X MD Europe and Chi-X MD Canada
<= 1.15		Older versions

1. Introduction

This document should be read in conjunction with:

- GMAC Product Overview
- GMAC API Reference Guide
- GMAC V1 and V3 Messages Templates

The GMAC (Generic Market capture ACcelerator) is configured using an XML-style '.cfg' file. This configuration file is loaded by the GMAC libraries when GMAC is initialized.

Example configuration files are shipped with your software. These files were created using reliable, fully tested settings. This document explains these configuration files and describes the configuration options available in the Celoxica software.

Celoxica highly recommends creating backup copies of any configuration files before editing.

Note:

Each market feed requires specific settings, but it is possible to configure multiple market feeds in one configuration file, see *Configuring Multiple Markets*.

Boolean variables in the configuration files can have any of the following values. These values are fully interchangeable:

on	off
1	0
true	false
yes	no
enable	disable
enabled	disabled
t	f
y	n

2. Configuration File Schema

The basic structure of a GMAC configuration file is shown in the following schema. Some tags may not be required for your configuration. Tags are shown in the schema, values are not.

```
<config>
      <gmac>
            <verbosity>
            <logfile>
            <ade-verbosity>
            <bufferpool>
            <force-raw-operation>
            <recovery>
            <recovery-logfile>
            <recovery-log-socket>
            <recovery-affinity>
            <simulated-dropping-chance>
            <simulated-dropping-gap-range>
            <simulated-dropping-on-signal>
            <simulated-dropping-logfile>
            <hardware-filtering>
            <print-absent-fields>
            <subscription>
            <fast-decoding>
            <!-- See Note 1 below -->
            <markets>
                  <market> 0
                        <verbosity>
                        <time-zone>
                        <v3>
                        <fast-decoding>
                        <hardware-filtering>
                        <channels>
                              <channel> 0
                              <channel> 1
                              <channel> n
                        </channels>
                        <recovery>
                              <channel> 0
                              <channel> 1
                              <channel> n
                        </recovery>
                  </market>
                  <!-- See Note 2 below -->
                  <market> 1
                  <market> n
            </markets>
      </gmac>
</config>
```

Note #1:

For information on general configuration settings, see *General Configuration Settings*.

Note #2:

For further information on market-specific configurations, see *Market Specific Configuration Settings*.

3. General Configuration Settings

The first settings in a configuration file are general configurations (i.e. they are not market-dependent). This section describes each of these settings.

3.1 General Configurations

3.1.1 config

Description This tag initiates a body for GMAC or Order Book configurations to be made in a file. This tag is at the top of the file.

Usage `<config>`

Parameters `N/A`

Example `N/A`

3.1.2 config.gmac

Description This tag initiates a body for GMAC configurations to be made.

Usage `<gmac>`

Parameters `N/A`

Example `N/A`

3.1.3 config.gmac.print-absent-fields

Description Selects whether fields set as 'not present' in GMAC messages (presence bit not set) should be printed as '<undefined>' or simply not printed when using `GMACPrintMessages()` or `GMACPrintMessagesEx()`.

Usage `<print-absent-fields> enbl </print-absent-fields>`

Parameters

`enbl`	Boolean which enables or disables printing of not present fields. Default is off.

Example `<print-absent-fields> on </print-absent-fields>`

3.1.4 config.gmac.register-affinity

Description Specifies the CPUs on which the Celoxica register thread is allowed to run, as a bitmask. The Celoxica register thread is used across the product range for logging, and is not latency-critical.

If used, the environment variable CELOXICA_AFFINITY_REGISTER supersedes `<register-affinity>`.

Usage `<register-affinity> CPU </register-affinity>`

Parameters

`CPU`	Integer.

Example `<register-affinity> 1 </register-affinity>`

3.1.5 config.gmac.other-affinity

Description Specifies the CPUs on which other non-latency-critical Celoxica threads are allowed to run, as a bitmask. Such threads include the network emulation thread, which enables the accelerator card to exchange non-offloaded traffic with the OS network stack, the Order Book snapshot management thread and the GMAC scheduler thread.

If used, the environment variable CELOXICA_AFFINITY_OTHER supersedes `<other-affinity>`.

Usage `<other-affinity> CPU </other-affinity>`

Parameters

`CPU`	Integer.

Example `<other-affinity> 1 </other-affinity>`

3.1.6 config.gmac.register-directory

Description Specifies the location of the log file generated by the Celoxica register thread. If not set, the log file is written to ./log/default.log.

If used, the environment variable CELOXICA_REGISTER_DIR supersedes `<register-directory>`.

Usage `<register-directory> string </register-directory>`

Parameters

`String`	Log file location

Example `<register-directory> ./log/default.log </register-directory>`

3.1.7 config.gmac.register-no-sigabrt

Description The register library traps the SIGABRT signal and the pending logs are flushed before the application quits.

If set, any pending logs will be lost on application assert or abort.

If used, the environment variable CELOXICA_REGISTER_NO_SIGABRT supersedes `<register-no-sigabrt>`.

Usage `<register-no-sigabrt> enbl </register-no-sigabrt>`

Parameters

`enbl`	Boolean. Default is off.

Example `<register-no-sigabrt> on </register-no-sigabrt>`

3.1.8 config.gmac.fast-decoding

Description Enables or disables globally the hardware FAST decoding.

When enabled globally, the hardware FAST decoding can be disabled on a per market basis.

Hardware FAST decoding is transparent to GMAC client code: no API or template changes apply.

Usage `<fast-decoding> enbl </fast-decoding>`

Parameters `enbl` Boolean.

Default is off.

Example `<fast-decoding> on </fast-decoding>`

3.2 Verbosity

3.2.1 config.gmac.verbosity

Description Configures the GMAC verbosity.

Usage `<verbosity> verbosity </verbosity>`

Parameters `verbosity` Integer from 0 to 5, 0 displays no information.

Default is 0.

Example `<verbosity> 3 </verbosity>`

3.2.2 config.gmac.logfile

Description Configures the file where the GMAC verbosity output is logged.

The file is created in "./logs" by default. The path can be adjusted using the environment variable CELOXICA_REGISTER_DIR.

GMAC logs messages to stdout if `<logfile>` is not set.

Usage `<logfile> logFile </logfile>`

Parameters `logFile` File name

Example `<logfile> gmac.log </logfile>`

3.2.3 config.gmac.ade-verbosity

Description The ADE (Accelerated Data Engine) handles the data input streams into the driver. This setting configures the level of verbosity for the output that ADE logs to stdout.

Usage `<ade-verbosity> verbosity </ade-verbosity>`

Parameters `verbosity` Integer from 0 to 5, 0 displays no information.

Default is 0.

Example `<ade-verbosity> 3 </ade-verbosity>`

3.3 Timeouts

3.3.1 config.gmac.multicast-timeout-us

Description The time to wait without receiving a multicast message (heartbeat or any) before issuing a GMAC_TYPE_MULTICAST_TIMEOUT message.

Usage `<multicast-timeout-us> mTimeout </multicast-timeout-us>`

Parameters `mTimeout` Time to wait for multicast heartbeats.

This number is in microseconds.

Example

```
<multicast-timeout-us> 1000000 </multicast-timeout-us>
```

3.3.2 config.gmac.reissue-subscriptions

Description Number of multicast timeouts.

The IGMP subscription to router is re-issued when the number of multicast timeouts is greater than `<reissue-subscriptions>`.

Note:

> The IGMP subscription is only attempted for channels that support subscription i.e. not file, TCP or null channels.

Usage

```
<reissue-subscriptions> Nbr </reissue-subscriptions>
```

Parameters `Nbr` Integer

Example

```
<reissue-subscriptions> 5 </reissue-subscriptions>
```

3.3.3 config.gmac.send-multicast-timeout-messages

Description Enables or disables the generation of GMAC timeout messages when the multicast timeout is in use.

Usage

```
<send-multicast-timeout-messages> enbl </send-multicast-timeout-messages>
```

Parameters `Enbl` Boolean.

Default is yes.

Example

```
<send-multicast-timeout-messages> No </send-multicast-timeout-messages>
```

3.4 Reorder / Recovery

3.4.1 config.gmac.bufferpool

Description Configures the reorder/recovery buffer settings; Celoxica does not recommend adjusting these settings.

Usage

```
<bufferpool> numBytes numBuffers </bufferpool>
```

Parameters `numBytes` Number of bytes per buffer.

`numBuffers` Number of buffers.

Example

```
<bufferpool> 1048576 64 </bufferpool>
```

3.4.2 config.gmac.reorder-max

See Line Arbitration.

3.4.3 config.gmac.reorder-timeout-ns

See Line Arbitration.

3.4.4 config.gmac.force-raw-operation

Description Configures the raw operation.

Usage `<force-raw-operation> enbl </force-raw-operation>`

Parameters

`enbl`	Boolean which enables raw operation. Packets are not reordered in raw operation. Default is off.

Example `<force-raw-operation> off </force-raw-operation>`

3.5 Recovery Settings

Recovery allows the user to recover dropped packets on supported markets. The following settings are configured at the start of the configuration file, for information on configuring the recovery channel settings see *Market Configuration Settings*.

Note:

If you have multiple markets configured, market recovery has to be configured on all the markets directed to a channel or GMAC returns a configuration error, see *Configuring Multiple Markets*.

3.5.1 config.gmac.recovery

Description Configures the recovery.

Usage `<recovery-enabled> enbl </recovery-enabled>`

Parameters

`enbl`	Boolean which enables or disables market recovery globally. Default is off.

Example `<recovery-enabled> on </recovery-enabled>`

3.5.2 config.gmac.recovery-logfile

Description Configures the file where recovery activity is logged.

Usage `<recovery-logfile> recoveryLog </recovery-logfile>`

Parameters

`recoveryLog`	Name of the file where recovery related activity is logged.

Example

```
<recovery-logfile> recovery.log </recovery-
logfile>
```

3.5.3 config.gmac.recovery-log-socket

Description Configures the logging of data from the recovery socket to the recovery log file.

Usage `<recovery-log-socket> logSocket </recovery-log-`

socket>

Parameters `logSocket` Boolean enabling the logging of data from the recovery socket to the recovery log file.

Default is off.

Example
```
<recovery-log-socket> off </recovery-log-socket>
```

3.5.4 config.gmac.recovery-affinity

Description Recovery affinity allows for the recovery thread to be processed by a dedicated CPU in the system.

Usage
```
<recovery-affinity> recAffinity </recovery-affinity>
```

Parameters `recAffinity` Mask for CPU affinity, i.e. 15 = 0xFF = any free CPU.

Default is 0xFF.

Example
```
<recovery-affinity> 15 </recovery-affinity>
```

3.5.5 config.gmac.recovery-reconnect-max-retries

Description Option specifying how many times GMAC will retry to establish a broken TCP connection in the recovery thread.

When no maximum is required, the word ‘infinity’ can be used instead of an integer.

The retry counter is reset on successful TCP connection.

Usage
```
<recovery-reconnect-max-retries> retries
</recovery-reconnect-max-retries>
```

Parameters `retries` Integer specifying maximum number of retries.

Default is 3.

Example
```
<recovery-reconnect-max-retries> 10 </recovery-
reconnect-max-retries>
```

3.5.6 config.gmac.recovery-reconnect-backoff-max-seconds

Description The recovery thread uses a dynamic back-off timer to delay the retries between TCP connection failures.

The back-off intervals are 0, 1, 2, 5, 10, 20 and 30 seconds.

The dynamic back-off timer is reset on successful TCP connection.

The setting constrains the maximum delay for the back-off timer.

Usage
```
<recovery-reconnect-backoff-max-seconds> max
</recovery-reconnect-backoff-max-seconds>
```

Parameters `max` Integer specifying the maximum number of seconds for the back-off timer.

Default is 30 seconds.

Example
```
<recovery-reconnect-backoff-max-seconds> 10
</recovery-reconnect-backoff-max-seconds>
```

3.6 Hardware Symbol Filtering

3.6.1 config.gmac.hardware-filtering

Description Enables or disables the hardware symbol filtering globally.

When enabled packets will be directed through the filtering modules for supported markets. However, these packets will not be filtered until filtering is enabled for the market using the GMAC API call `GMACFilteringEnable()`.

For plugins supporting hardware symbol filtering except ITCH: GMAC and its underlying libraries permit a single instance of a particular market to have hardware filtering enabled per card. Additionally multi-queue filtering on a single market is not permitted.

For ITCH only: hardware symbol filtering can be enabled on two separate queues with separate symbol lists on interface ac0 and interface ac1.

Note #1:

> `GMACFilteringEnable()` will be called automatically for markets that support hardware symbol filtering when using the Celoxica order book.

Note #2:

> See *config.gmac.markets.market.channels.channel* for details about the channels configuration when hardware symbol filtering is enabled.

Usage `<hardware-filtering> enable </hardware-filtering>`

Parameters

`enable`	Boolean setting to enable or disable this feature

Example `<hardware-filtering> on </hardware-filtering>`

3.7 Subscriptions

3.7.1 config.gmac.subscription

Description Configures the sending of subscription IGMP packets.

Usage `<subscription> enbl </subscription>`

Parameters

`enbl`	Boolean which enables the GMAC sending subscription IGMP packets. Default is on.

Example `<subscription> on </subscription>`

4. Testing Configuration Settings

This chapter explains the settings involved in configuring GMAC for testing or debugging purpose.

4.1 Simulated Dropping

GMAC can be forced to drop packets for the purposes of testing recovery.

If you are not testing `<simulated-dropping-on-signal>` should be off as simulated dropping interferes with receiving accurate data.

4.1.1 config.gmac.simulated-dropping-chance

Description Configures the likelihood of a packet being dropped, this is a decimal between 0 and 1, for example; 0.10000 = one packet in ten and 0.00100 = one packet in a thousand.

Usage
```
<simulated-dropping-chance> chance </simulated-dropping-chance>
```

Parameters

`chance`	A decimal representing the likelihood of a packet being dropped

Example
```
<simulated-dropping-chance> 0.00100 </simulated-dropping-chance>
```

4.1.2 config.gmac.simulated-dropping-gap-range

Description Configures the range of dropped packets in each group of dropped packets, i.e. the number of dropped packets in each group is between the integers min and max.

Usage
```
<simulated-dropping-gap-range> min max </simulated-dropping-gap-range>
```

Parameters

`min`	Minimum number of dropped packets in a group
`max`	Maximum number of dropped packets in a group

Example
```
<simulated-dropping-gap-range> 5 20 </simulated-dropping-gap-range>
```

4.1.3 config.gmac.simulated-dropping-logfile

Description Configures the file where dropping information is logged.

Usage
```
<simulated-dropping-logfile> logFile </simulated-dropping-logfile>
```

Parameters

`logFile`	File where dropping information is logged

Example
```
<simulated-dropping-logfile> dropping.log </simulated-dropping-logfile>
```

4.1.4 config.gmac.simulated-dropping-on-signal

Description Enables or disables simulated dropping.

Usage `<simulated-dropping-on-signal> drop </simulated-dropping-on-signal>`

Parameters

`drop`	Boolean enabling or disabling simulated dropping

Example `<simulated-dropping-on-signal> yes </simulated-dropping-on-signal>`

4.2 DMA Buffer Dumping

GMAC can dump the DMA buffer on payload error for testing or debugging purpose.

Enabling DMA buffer dumping is done by setting `<ade-dump-on-payload-error>` to yes.

4.2.1 config.gmac.ade-dump-on-payload-error

Description Enables or disables DMA buffer dumping on payload error.

If set, `config.gmac.ade-dump-file-name` must be supplied.

Usage `<ade-dump-on-payload-error> enbl </ade-dump-on-payload-error>`

Parameters

`enbl`	Boolean which enables the DMA buffer dumping on payload error. Default is off.

Example `<ade-dump-on-payload-error> on </ade-dump-on-payload-error>`

4.2.2 config.gmac.ade-dump-file-name

Description Sets the path and file name used for DMA buffer dumping.

The name given will have the queue number and the dump number appended to it. For example, if set to ade-dump.txt, dump files will be given names in the format ade-dump.txt.<queue number>.<dump number> - e.g. ade-dump.txt.0.0.

Note that dump files can be converted to human-readable format using the 'ade_dump_to_text' utility which is included in the GMAC package.

Usage `<ade-dump-file-name> file </ade-dump-file-name>`

Parameters

`File`	File name

Example `<ade-dump-file-name> ade-dump.txt </ade-dump-file-name>`

4.2.3 config.gmac.ade-dump-max-interval-us

Description Sets the maximum DMA buffer dumping rate.

This is the minimum period of time that must elapse between dumping the lldt buffer for each queue.

There is no limit if set to 0.

Usage `<ade-dump-max-interval-us> rate </ade-dump-max-interval-us>`

Parameters

`Rate`	Time in microseconds.

Default is 0.

Example `<ade-dump-max-interval-us> 100 </ade-dump-max-interval-us>`

4.2.4 config.gmac.ade-dump-max-packets

Description Sets the maximum number of packets to dump in each dump file.

There is no limit if set to 0.

Usage `<ade-dump-max-packets> packets </ade-dump-max-packets>`

Parameters

`packets`	Integer.	
	Default is 0.	

Example `<ade-dump-max-packets> 0 </ade-dump-max-packets>`

5. Market Configuration Settings

This chapter explains the settings involved in configuring the markets and channels on GMAC.

5.1 Market Configurations

5.1.1 config.gmac.markets

Description Enables configuring of market subscriptions. For more information on configuring multiple markets, see *Configuring Multiple Markets*.

Usage `<markets>`

Parameters `N / A`

Example `N / A`

5.1.2 config.gmac.markets.market

Description Configures a market with integer id and string name used to identify the market.

See the market specific configurations sections for details of each market / protocol.

Usage `<market> id name optLabel`

Parameters

`Id`	Id of the market
`name`	Name of the market
`optLabel`	Optional label for this market. Allows a user-defined label to be used for each market. Useful when using multiple market sections for the same exchange. If set, the label will be returned by `GMACMulticastGetMarketID()` as the market name, and referenced in log messages.

Example

```
<market> 0 ARCA
<market> 2 DirectEdge DirectEdgeA
<market> 3 DirectEdge DirectEdgeX
```

5.1.3 config.gmac.markets.market.fast-decoding

Description Enables or disables the hardware FAST decoding on a per-market basis.

When enabled, the hardware FAST decoding must also be enabled globally using configuration node `gmac.fast-decoding`.

Note:

> This setting is only effective for plugin CME2.

Usage `<fast-decoding> enbl </fast-decoding>`

Parameters

`enbl`	Boolean. Default is off.

Example `<fast-decoding> on </fast-decoding>`

5.1.4 config.gmac.markets.market.start-seq

Description Specifies the first sequence number to be re-requested by this market in the event of a mid-day start, default is 0. This setting is only valid if recovery is enabled. `startSeq` is an integer greater than or equal to 0, or if set to undefined, GMAC takes the first sequence number it sees as the first sequence number.

Usage `<start-seq> startSeq </start-seq>`

Parameters

`startSeq`	The first sequence number to be re-requested in the event of a mid-day start

Example `<start-seq> undefined </start-seq>`

5.1.5 config.gmac.markets.market.maximum-gap

Description Maximum-gap configures the maximum size of gap which can be requested for recovery. The request size is limited by increasing the start number of the sequence to be recovered. Note that the exchange definitions are not affected by maximum-gap.

Usage `<maximum-gap> max </maximum-gap>`

Parameters

`max`	Maximum recovery gap requested, if set to zero or below, nothing is requested

Example `<maximum-gap> -1 </maximum-gap>`

5.1.6 config.gmac.markets.market.verbosity

Description Configures the verbosity for this market, `marketVrb` is an integer value from 0 to 5, 0 displaying no information, 5 displaying the most information.

Default is `0`.

Usage `<verbosity> marketVrb </verbosity>`

Parameters

`marketVrb`	Verbosity displayed by this market

Example `<verbosity> 3 </verbosity>`

5.1.7 config.gmac.markets.market.time-zone

Description Configures the current time-zone for this market.

The `tmz` value may be set to the number of hours the market's time-zone is east of Greenwich (London). If you would like to have timestamps set to the exchange time then set this value to 0. This value must be changed for Daylight Savings Time. Setting a time-zone less than -23 and greater than 23 results in an error.

The `tmz` value 'auto' may also be used to specify that the exchange timestamp be automatically corrected to UTC.

Corrected timestamps will wrap around if the time-zone correction push them beyond midnight in either direction.

Note:

> This setting is **not** effective for LSE.

Usage `<time-zone> tmz </time-zone>`

Parameters `tmz` Time-zone for this market

Example To convert TSX (Toronto) to LSE (London) time, with a time difference of 4 hours, use:

```
<time-zone> -4 </time-zone>
```

5.1.8 config.gmac.markets.market.packet-timeout-ms

Description Configures the time to wait for a requested packet in milliseconds.

Note:

> This setting is **not** effective for the following markets: CME, CQS, CTS, ICE, LSE, UQDF and UTDF.

Usage `<packet-timeout-ms> ptm </packet-timeout-ms>`

Parameters `ptm` Packet timeout in milliseconds

Example `<packet-timeout-ms> 3000 </packet-timeout-ms>`

5.1.9 config.gmac.markets.market.task-time-ms-to-live

Description Configures the lifespan of a single gap recovery task.

Only one task can exist at any time on the multicast.

Note:

> This setting is **not** effective for the following markets: CME, CQS, CTS, LSE, UQDF and UTDF.

Usage `<task-time-ms-to-live> tTime </task-time-ms-to-live>`

Parameters `tTime` Timeout in milliseconds

Example `<task-time-ms-to-live> 1500 </task-time-ms-to-live>`

5.1.10 config.gmac.markets.market.task-time-ms-to-retry

Description Configures the time to wait for the reception of the next packet within the gap recovery task before retrying the task, in milliseconds.

Note:

> This setting is **only** effective for the following markets: BATS, DirectEdge, LIFFE-XDP, LSE Millennium, ITCH_BROKERTEC and ITCH41.

Usage `<task-time-ms-to-retry> tRetry </task-time-ms-to-retry>`

Parameters `tRetry` Timeout in milliseconds

Example `<task-time-ms-to-retry> 2000 </task-time-ms-to-retry>`

5.1.11 config.gmac.markets.market.task-number-of-retries

Description Configures a number of times to retry a gap recovery task.

Note:

> This setting is **only** effective for the following markets: LIFFE-XDP and ITCH_BROKERTEC.

Usage `<task-number-of-retries> retryNo </task-number-of-retries>`

Parameters

`retryNo`	Integer. Default is 3.

Example `<task-number-of-retries> 3 </task-number-of-retries>`

5.1.12 config.gmac.markets.market.v3

Description The V1 transcoder is used by default for any markets with v3 capabilities combined with V1 capabilities. The <v3> tag must be enabled in order to generate messages from the V3 transcoder.

See the Market Data Market Support Matrix for details of which version of the API to use with each supported feed.

Usage `<v3> enbl </v3>`

Parameters

`enbl`	Enable messages generated by the GMAC V3 transcoder

Example `<v3> off </v3>`

5.1.13 config.gmac.markets.market.use-order-depth-multiple

Description Enables order depth messages to be combined into one message in the GMAC framework. This is relevant when multiple order depths are received in a single message from the exchange (for example, NYSE).

Usage `<use-order-depth-multiple> enbl </use-order-depth-multiple>`

Parameters

`enbl`	Boolean which enables combining multiple order depths into one message. Default is off.

Example `<use-order-depth-multiple> off </use-order-depth-multiple>`

5.1.14 config.gmac.markets.market.symbol-ref-file

Description For some markets, it is possible to specify a symbol reference file or files that will be processed. This parameter specifies the path to the file(s).

The path may be:

- To a local or remote drive visible to the host system
    - A URL, in which case `wget` will be invoked to copy the file to the local directory. This is useful for downloading reference files that the exchange makes available via ftp or http. If the local file already exists it will be overwritten (unless `wget` can determine that the local file is already up-to-date).
    - Note that the `wget` output will be seen unless verbosity is zero. If verbosity is 4 or greater there will be some additional trace.
    - Note that currently it is not possible to download files using the accelerator card; another interface (e.g. a port on a regular NIC) must be used, which must have access to the network from which the file is accessible.
- To a script, which may for instance download/rename/copy the necessary file(s):
    - The script must only output a (whitespace-separated) file list to `stdout`, which GMAC will use as its input. Any other logging must therefore be suppressed or written to a file so that GMAC only receives a file list.
    - The script must return 0 upon completion, else GMAC will issue a 'failed to initialise' error message and quit.
    - When specifying a script, prefix its path with `'cmd://'`
    - For the first of the two cases above, if the path includes any `strftime` type format specifiers, these are expanded using the current local time.

Usage `<symbol-ref-file> path </symbol-ref-file>`

Parameters

`path`	Path to file(s) or script, or URL

Example

```
<symbol-ref-file> path/file.txt </symbol-ref-file>

<symbol-ref-file> http://host:port /path/file.txt
</symbol-ref-file>

<symbol-ref-file>
    ftp://user:password@host/path/file.txt </symbol-ref-
file>

<symbol-ref-file>
    ftp://USER:PASS@194.169.8.155:21/%Y%m%d_XLON_Instrument.csv
</symbol-ref-file>
<symbol-ref-file> cmd://myscript.sh </symbol-ref-
file>
```

5.1.15 config.gmac.markets.market.market-hours

Description Allows users to specify the trading hours for the current market, to enable GMAC to infer the market trading status in the event of a mid-day start, before a full refresh is processed (or in the absence of one). GMAC uses the exchange timestamps to determine the time of the day, and hence this feature is only supported on exchanges that disseminate timestamps.

To query the inferred market state, use API method `GMACQueryMarketHours()` – see GMAC API Reference Guide for details. The Celoxica Order Book is also able to use this feature, depending on the setting in configuration node config.book.deepbook.market-status-correction – see Order Book Configuration Guide for details.

Usage `<market-hours> openingTime closingTime </market-hours>`

Parameters

`openingTime`	Start of trading hours
`closingTime`	End of trading hours

Example `<market-hours> 08:59:30 16:30:00 </market-hours>`

5.1.16 config.gmac.markets.market.market-prefix

Description Allows users to specify the 'Extended ISIN' prefix string.

If specified, it must be exactly 4 characters and it will replace the value normally used by the transcoder plugin.

This can be useful to ensure that 2 (or more) markets using the same transcoder have different EISIN prefixes.

Usage `<market-prefix> prefix </market-prefix>`

Parameters

`prefix`	The 4 character prefix to use

Example `<market-prefix> UDEA </market-prefix>`

5.1.17 config.gmac.markets.market.socket-max-retries

Description Sets the maximum number of times to attempt reconnection within a given time frame.

Sets -1 to retry forever.

This config node only applies to TCP feeds using the socket plugin.

Usage `<socket-max-retries> Nbr </socket-max-retries>`

Parameters

`Nbr`	Integer

Example `<socket-max-retries> 3 </socket-max-retries>`

5.1.18 config.gmac.markets.market.socket-max-retries-us

Description Sets the time frame used by `<socket-max-retries>`.

Usage `<socket-max-retries-us> time </socket-max-retries-us>`

Parameters

`time`	Expressed in microseconds.

Example `<socket-max-retries-us> 10000 </socket-max-retries-us>`

5.1.19 config.gmac.markets.market.socket-backoff-period-s

Description Sets the time to wait between TCP reconnections.

This config node should be used in conjunction with `<socket-max-retries>`.

Sets 0 to retry as quickly as possible.

This config node only applies to TCP feeds using the socket plugin.

Usage `<socket-backoff-period-s> time </socket-backoff-period-s>`

Parameters

`time`	Expressed in seconds.

Example `<socket-backoff-period-s> 1 </socket-backoff-period-s>`

5.2 Standard Multicast Channel Settings

5.2.1 config.gmac.markets.market.channels

Description Container tag for a list of multicast channels for the current market.

Usage `<channels>`

Parameters `N / A`

Example `N / A`

5.2.2 config.gmac.markets.market.channels.channel

Description Configures the list of live multicast channels. Standard parameters are illustrated; parameters are set differently for multicast channels in some markets below.

Usage `<channel> localChanId numQueue srcPlugin interface srcIP:port enblRec startSeq useDumps </channel>`

Parameters

`localChanId`	The local id for this channel, must be unique for the market
`numQueue`	The DMA queue number which this channel is delivered. Can be set to 0 or 1 for the 1G cards. Can be set from 0 to 16 for the 10G cards.
`srcPlugin`	The source for this channel, set to `lldt` when using the accelerator card
`interface`	The physical interface on the accelerator card where the channel is received. If required, a particular interface on a VLAN can be specified.
`srcIP:port`	The multicast IP address and port for this channel
`enblRec`	Boolean argument enabling or disabling recovery on this channel. Can be set to '-' in order to use the global or default value. Default is off.

Note:

> config.gmac.recovery must be enabled for this setting to function.

`startSeq`	Sets the first sequence number to be re-requested by this channel in the event of a mid-day start, can be set to '-' in order to use the global or default value. This is an integer greater than or equal to 0, or can be set to undefined, for more information see *config.gmac.markets.market.start-seq*.
`useDumps`	Legacy setting, always ignored: set to '-'

Example

```
<channel> 0 0 lldt ac0 224.0.62.2:30001 no
undefined - </channel>
```

```
Interface on VLAN 444:
<channel> 0 0 lldt ac0.444 224.0.62.2:30001 no
```

```
undefined - </channel>
```

Notes

The number of multicast channels is limited to **256** per port (interface).

The filtering firmware (v5.x) supports a maximum of **144** multicast channels.

Besides, the channels must be declared in an optimal order when using filtering firmware. Indeed, the hardware symbol filtering module can only handle channels with router tags **<= 127**. Router tags are allocated internally in the order that channels are declared in the configuration and thus bear no relation to the localChanIds.

It is therefore not possible to configure more than 128 lldt channels that use hardware symbol filtering.

It is however possible to configure more than 128 lldt channels in total as long as channels using hardware symbol filtering are strictly within the first 128. This means:

- If using multiple queues, the queues comprising channels with hardware symbol filtering should be declared first.
- If using a single queue, markets using hardware symbol filtering should be declared first.

For plugins supporting hardware symbol filtering except ITCH: multi-queue hardware filtering on single markets is not supported.

For ITCH only: hardware symbol filtering can be enabled on two separate queues with separate symbol lists on interface ac0 and interface ac1.

5.2.3 config.gmac.markets.market.snapshots

Description Container tag for a list of snapshot/refresh channels for the current market.

Usage

```
<snapshots>
```

Parameters N / A

Example N / A

5.2.4 config.gmac.markets.market.snapshots.channel

Description Configures a snapshot/refresh channel, and associates it with the corresponding live/incremental update channel (as per `config.gmac.markets.market.channels`).

When a snapshot channel is configured, the snapshot recovery must be enabled/disabled using `config.gmac.markets.market.snapshot-enabled`.

Usage

```
<channel> localChanId numQueue srcPlugin interface
srcIP:port enblRec startSeq useDumps </channel>
```

Parameters

`localChanId`	The local id for this channel, must be unique for the market. This must match the `localChanId` for the corresponding live channel (config node *config.gmac.markets.market.channels*).
`numQueue`	The DMA queue number which this channel is delivered. Can be set to 0 or 1 for the 1G cards. Can be set from 0 to 16 for the 10G cards.
`srcPlugin`	The source for this channel, set to `lldt` when using the accelerator card
`interface`	The physical interface on the accelerator card where the channel is received.
`srcIP:port`	The multicast IP address and port for this channel

`enblRec`	Not used for snapshot channels. Always set to '-'.
`startSeq`	Not used for snapshot channels. Always set to '-'.
`useDumps`	Not used for snapshot channels. Always set to '-'.

Example

```
<channel> 0 0 lldt ac0 224.0.26.21:11003 - - -
</channel>
```

5.3 Line Arbitration

UDP IP protocol market feeds are transmitted on duplicate physical lines from stock exchanges to compensate for UDP unreliability. Line arbitration replaces lost data on a UDP market data feed with data from a duplicated feed. Data packets then undergo other tasks such as sequence number checking before being sent to processor cores.

Note:

Dumping to file must be disabled when line arbitration is configured.

Arbitrage is only supported on incremental channels for CME. Attempting to configure it for snapshot or security definition channels will result in a GMAC error.

5.3.1 config.gmac.markets.market.channels.channel (Line arbitration)

Description The `<channel>` setting can be used to configure multicast channels for line arbitration. To enable arbitration on a channel, two `<channel>` settings must be configured, one for each arbitration channel (A and B).

Note #1:

Arbitrage channels may not be configured under the `<snapshot>` tag (configuration node `config.gmac.markets.market.snapshots`).

Attempting to do so will result in a GMAC error.

Note #2:

Duplicated feeds must be connected to a single GMAC. Feeds must be received on the same channel (`localChanId`) and must be sent to the same queue (`numQueue`).

Usage

```
<channel> localChanId numQueue srcPlugin interface
srcIP:port </channel>
```

Parameters

`localChanId`	The local id for this channel; must be unique for the market. This is an integer followed by a character to indicate the arbitration channel
`numQueue`	See *Standard Multicast Channel Settings*
`srcPlugin`	See *Standard Multicast Channel Settings*
`interface`	See *Standard Multicast Channel Settings*
`srcIP:port`	See *Standard Multicast Channel Settings*

Example A GMAC receives two market data feeds:

- Feed 0 and Feed 1 are received on ac0.
- A duplicate of Feed 0 is received on ac1.

Line arbitration IS configured for Feed 0 (from 224.1.2.133:60000). Multicast channels 0A and 0B are seen below, these are sent to queue 0.

Line arbitration is NOT configured for Feed 1 (from 224.1.2.133:60001).

Multicast channel 1A is seen below, this is sent to queue 1.

```
<channel>   0A   0   lldt   ac0   224.1.2.133:60000
</channel>

<channel>   1A   1   lldt   ac0   224.1.2.133:60001
</channel>

<channel>   0B   0   lldt   ac1   224.1.2.133:60000
</channel>
```

5.3.2 config.gmac.reorder-max

Description Sets the maximum number of packets to be stored in the reorder/recovery buffer. This is only applicable if GMAC is not instructed to buffer the data.

If GMAC is instructed to buffer the data e.g. for snapshot, this limit will not be applicable and GMAC will buffer the data until the limit defined by *config.gmac.bufferpool*.

See the GMAC API Reference Guide.

Usage `<reorder-max> rMax </reorder-max>`

Parameters

`rMax`	Maximum packets to buffer. Default is 16.

Example `<reorder-max> 10000000 </reorder-max>`

5.3.3 config.gmac.reorder-timeout-ns

Description Sets the time for data to be stored in the reorder/recovery buffer.

Usage `<reorder-timeout-ns> timeout </reorder-timeout-ns>`

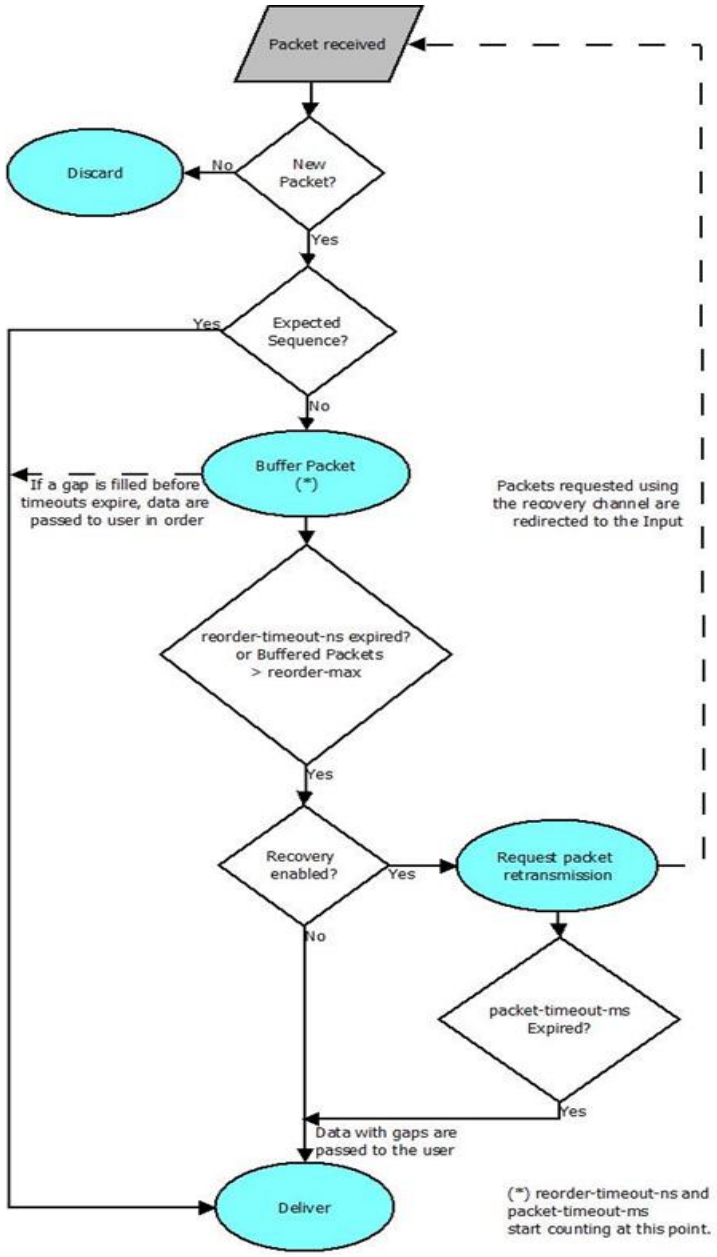
Parameters

`timeout`	Number of nanoseconds to buffer packets in the reorder/recovery buffer. Default is 10*1000*1000 ns i.e.10 ms.

Example `<reorder-timeout-ns> 100000 </reorder-timeout-ns>`

5.3.4 Configuring Timeouts

The following diagram illustrates the timeout behaviour.



The values for the timeouts are determined by whether reordering and recovery are enabled.

5.3.4.1 Reordering enabled, Recovery enabled

If recovery is enabled:

- `<reorder-max>` should be configured to a large number, in order to allow for packets awaiting recovery
- `<reorder-timeout-ns>` should be configured to a small value to ensure that recovery is activated promptly
- `<packet-timeout-ms>` must always be significantly larger than `<reorder-timeout-ns>` to allow for packet retransmission.

For example:

```
<reorder-max> 10000 </reorder-max>
<reorder-timeout-ns> 30000 </reorder-timeout-ns>
<packet-timeout-ms> 3000 </packet-timeout-ms>
```

5.3.4.2 Reordering enabled, Recovery disabled

If recovery is disabled:

- Both `<reorder-max>` and `<reorder-timeout-ns>` should be configured to small values. This allows for out of order packets to be re-ordered without introducing excessive delay.
- `<packet-timeout-ms>` is ignored when recovery is disabled.

For example:

```
<reorder-max> 4 </reorder-max>
<reorder-timeout-ns> 30000 </reorder-timeout-ns>
<packet-timeout-ms> 0 </packet-timeout-ms>
```

5.3.4.3 Reordering disabled, Recovery disabled

Reordering can only be disabled when recovery is disabled. Celoxica does not recommend this, as enabling reordering significantly reduces the risk of sending out-of-sequence packets

to the user application. <reorder-timeout-ms> and <packet-timeout-ms> are ignored when reordering and recovery are disabled.

For example:

```
<reorder-max> 0 </reorder-max>
<reorder-timeout-ns> 0 </reorder-timeout-ns>
<packet-timeout-ms> 0 </packet-timeout-ms>
```

5.3.4.4 Reordering disabled, Recovery enabled

Celoxica does not recommend this setting. Reordering should always be enabled when recovery is enabled. This allows for the buffering of data while awaiting packet retransmission.

5.4 Standard Recovery Channel Settings

5.4.1 config.gmac.markets.market.recovery

Description Enables the configuration of recovery channels for this market.

Usage `N / A`

Parameters `N / A`

Example `<recovery>`

5.4.2 config.gmac.markets.market.recovery.channel

Description Configures a recovery channel for the market. Standard parameters are illustrated; parameters are set differently for recovery channels in some markets below.

Usage

```
<channel> chanId numQueue plugin interface
recIP:port enblRec startSeq useDumps </channel>
```

Parameters

`chanId`	The local id for this channel, must be unique for the market
`numQueue`	The DMA queue number which this channel is delivered. Can be set to 0 or 1 for the 1G cards. Can be set from 0 to 16 for the 10G cards.
`plugin`	The source for this channel, set to `lldt` when using the accelerator card
`interface`	The physical interface on the accelerator card where the channel is received
`recIP:port`	The IP address and port of the TCP connection used to receive retransmission requests
`enblRec`	Always ignored, set to '-'
`startSeq`	Sets the first sequence number to be re-requested by this recovery channel in the event of a mid-day start, can be set to '-' in order to use the global or default value. This is an integer greater than or equal to 0, or can be set to undefined, for more information see *config.gmac.markets.market.start-seq*.
`useDumps`	Legacy setting, always ignored: set to '-'

Example

```
<channel> 0 0 lldt ac1 224.0.62.3:30001 -
undefined - </channel>
```

5.5 Hardware Symbol Filtering

5.5.1 config.gmac.markets.market.hardware-filtering

Description This option is used to disable GMAC filtering on a per-market basis when symbol filtering is enabled globally.

Note #1:

> This parameter will be ignored for markets that do not support filtering.

Note #2:

> See *config.gmac.markets.market.channels.channel* for details about the channels configuration when hardware symbol filtering is enabled.

Usage `<hardware-filtering> enable </hardware-filtering>`

Parameters

`enable`	Boolean setting to enable or disable this feature

Example `<hardware-filtering> off </hardware-filtering>`

6. Market Specific Configuration Settings

This chapter describes the configurations specific to individual markets.

Note:

Some configurations may be located outside the `<markets>` tag, as stated.

6.1 Arcabook for Equities FAST/FIX

Tag config.gmac.markets.market ARCA

6.1.1 config.gmac.markets.market.symbol-ref-file

Description Location of the symbol reference file, containing the SessionID and MappingIndex used for each Symbol in the book. This local file may be generated by GMAC, from the symbol reference information requested via TCP (see below).

Usage
```
<symbol-ref-file> symbFile </symbol-ref-file>
```

Parameters `symbFile` Location of the symbol reference file

Example
```
<symbol-ref-file> /tmp/ArcaSymIdx.20100902
</symbol-ref-file>
```

6.1.2 config.gmac.markets.market.write-symbol-ref-file

Description Symbol reference file destination. If this is specified, GMAC attempts to write the symbol reference file when the symbol reference information is received via TCP. If writing fails then an error is logged but processing continues. Any existing reference file with the same file name is not overwritten.

Usage
```
<write-symbol-ref-file> writeFile </write-symbol-
ref-file>
```

Parameters `writeFile` Symbol reference file destination

Example
```
<write-symbol-ref-file> /tmp/ArcaSymIdx </write-
symbol-ref-file>
```

6.1.3 config.gmac.markets.market.extension-messages

Description Enables the generation of extension messages, by default these are disabled.

Usage
```
<extension-messages> extMsgs </extension-messages>
```

Parameters `extMsgs` Boolean which enables/disables setting

Example
```
<extension-messages> on </extension-messages>
```

6.1.4 config.gmac.markets.market.recovery.channel

Description Configures a recovery channel for this market.

Usage

```
<channel> chanId numQueue plugin interface
srcIP:port enblRec startSeq useDumps recSrcIP
recSrcPort sourceID indxReq </channel>
```

Parameters

`chanId`	See *Standard Multicast Channel Settings*
`numQueue`	See *Standard Multicast Channel Settings*
`plugin`	See *Standard Multicast Channel Settings*
`interface`	See *Standard Multicast Channel Settings*
`srcIP:port`	See *Standard Multicast Channel Settings*
`enblRec`	See *Standard Multicast Channel Settings*
`startSeq`	See *Standard Multicast Channel Settings*
`useDumps`	See *Standard Multicast Channel Settings*
`recSrcIP`	IP address of the TCP connection used to request retransmissions
`recSrcPort`	Port of the TCP connection used to request retransmissions
`sourceID`	SourceID provided by ARCA for each customer
`indxReq`	Enable index requesting for this multicast channel, typically enabled for quotes channels and disabled for trades channels

Example

```
<channel> 0 0 socket eth0 224.1.2.143:13042 - - -
159.125.74.166 52015 _SOURCE_ID_ yes </channel>
```

6.2 Arcabook for Equities Uncompacted

Tag config.gmac.markets.market ARCA_UNCOMPACTED

6.2.1 config.gmac.markets.market.symbol-ref-file

Description Location of the symbol reference file, containing the SessionID and MappingIndex used for each Symbol in the book. This local file may be generated by GMAC, from the symbol reference information requested via TCP (see below).

Usage
```
<symbol-ref-file> symbFile </symbol-ref-file>
```

Parameters `symbFile` Location of the symbol reference file

Example
```
<symbol-ref-file> /tmp/ArcaSymIdx.20100902
</symbol-ref-file>
```

6.2.2 config.gmac.markets.market.write-symbol-ref-file

Description Symbol reference file destination. If this is specified, GMAC attempts to write the symbol reference file when the symbol reference information is received via TCP. If writing fails then an error is logged but processing continues. Any existing reference file with the same file name is not overwritten.

Usage
```
<write-symbol-ref-file> writeFile </ write-symbol-
ref-file>
```

Parameters `writeFile` Symbol reference file destination

Example
```
<write-symbol-ref-file> /tmp/ArcaSymIdx </ write-
symbol-ref-file>
```

6.2.3 config.gmac.markets.market.extension-messages

Description Enables the generation of extension messages, by default these are disabled.

Usage
```
<extension-messages> extMsgs </extension-messages>
```

Parameters `extMsgs` Boolean which enables/disables setting

Example
```
<extension-messages> on </extension-messages>
```

6.2.4 config.gmac.markets.market.recovery.channel

Description Configures a recovery channel for this market.

Usage
```
<channel> chanId numQueue plugin interface
srcIP:port enblRec startSeq useDumps recSrcIP
recSrcPort sourceID indxReq </channel>
```

Parameters

	`chanId`	See *Standard Multicast Channel Settings*
	`numQueue`	See *Standard Multicast Channel Settings*
	`plugin`	See *Standard Multicast Channel Settings*

`interface`	See *Standard Multicast Channel Settings*
`srcIP:port`	See *Standard Multicast Channel Settings*
`enblRec`	See *Standard Multicast Channel Settings*
`startSeq`	See *Standard Multicast Channel Settings*
`useDumps`	See *Standard Multicast Channel Settings*
`recSrcIP`	IP address of the TCP connection used to request retransmissions
`recSrcPort`	Port of the TCP connection used to request retransmissions
`sourceID`	SourceID provided by ARCA for each customer
`indxReq`	Enable index requesting for this multicast channel, typically enabled for quotes channels and disabled for trades channels

Example

```
<channel> 0 0 socket eth0 224.1.2.143:13042 - - -
159.125.74.166 52015 _SOURCE_ID_ yes </channel>
```

6.3 ARCA XDP

Tag config.gmac.markets.market ARCA_XDP

6.3.1 config.gmac.markets.market.normal-hours-orders-only

Description When enabled, only orders flagged as 'normal hours' are forwarded.

Usage
```
<normal-hours-orders-only> enbl </normal-hours-orders-only>
```

Parameters

`enbl`	Boolean. Default is off.

Example
```
<normal-hours-orders-only> on </normal-hours-orders-only>
```

6.3.2 config.gmac.markets.market.symbol-ref-file

Description This setting specifies the location of the XML or TXT reference files provided by the exchange, and is only needed when reading symbol references from file.

Usage
```
<symbol-ref-file> symbFile </symbol-ref-file>
```

Parameters

`symbFile`	Location of the symbol reference file

Example
```
<symbol-ref-file>
ftp://ftp.nysedata.com/ARCASymbolMapping/ARCASymbolMapping.txt
</symbol-ref-file>

<symbol-ref-file>
ftp://ftp.nysedata.com/ARCASymbolMapping/ARCASymbolMapping.xml
</symbol-ref-file>
```

6.3.3 config.gmac.markets.market.recovery.channel

Description Configures a recovery channel for the market.

Usage
```
<channel> chanId numQueue plugin interface
srcIP:port enblRec startSeq useDumps recSrcIP
recSrcPort sourceID NYSEProduct NYSEChannel
</channel>
```

Parameters

`chanId`	See *Standard Multicast Channel Settings*
`numQueue`	See *Standard Multicast Channel Settings*
`plugin`	See *Standard Multicast Channel Settings*
`interface`	See *Standard Multicast Channel Settings*
`srcIP:port`	See *Standard Multicast Channel Settings*
`enblRec`	See *Standard Multicast Channel Settings*
`startSeq`	See *Standard Multicast Channel Settings*
`useDumps`	See *Standard Multicast Channel Settings*
`recSrcIP`	IP address of the TCP connection used to request retransmissions
`recSrcPort`	Port of the TCP connection used to request retransmissions
`sourceID`	SourceID provided by ARCA for each customer

	NYSEProduct	NYSE product identifier used for recovery. Possible values are: 2 NYSE OpenBook Ultra 3 NYSE Quotes 4 NYSE Trades 9 NYSE Real-Time Reference Prices 11 NYSE Integrated Feed 51 NYSE MKT OpenBook Ultra 52 NYSE MKT Quotes 53 NYSE MKT Trades 57 NYSE MKT Real-Time Reference Prices 59 NYSE MKT Integrated Feed 151 NYSE ArcaBook 152 NYSE Arca BBO 153 NYSE Arca Trades 155 NYSE Arca Real-Time Reference Prices 157 NYSE Arca Integrated Feed
	NYSEChannel	NYSE channel

Example

```
<channel> 0 0 socket eth0 224.1.2.143:13042 - - -
159.125.74.166 52015 _SOURCE_ID_ 157 2 </channel>
```

6.3.4 config.gmac.markets.market.snapshot-enabled

Description Configures the snapshot/refresh recovery.

Usage

```
<snapshot-enabled> enbl </snapshot-enabled>
```

Parameters	enbl	Boolean which enables or disables snapshot/refresh recovery

Example

```
<snapshot-enabled> no </snapshot-enabled>
```

6.3.5 config.gmac.markets.market.snapshots.channel

Description Configures a snapshot channel for the market.

Note:

> chanIds must match the localChanIds in *config.gmac.markets.market.channels.channel* .

Usage

```
<channel> chanId numQueue plugin interface
recIP:port enblRec startSeq useDumps recSrcIP
recSrcPort sourceID NYSEProduct NYSEChannel
</channel>
```

Parameters	ChanId	See *Standard Multicast Channel Settings*
	numQueue	See *Standard Multicast Channel Settings*
	plugin	See *Standard Multicast Channel Settings*
	interface	See *Standard Multicast Channel Settings*
	recIP:port	See *Standard Multicast Channel Settings*
	enblRec	See *Standard Multicast Channel Settings*
	startSeq	See *Standard Multicast Channel Settings*
	useDumps	See *Standard Multicast Channel Settings*

recSrcIP	IP address of the TCP connection used to request retransmissions
recSrcPort	Port of the TCP connection used to request retransmissions
sourceID	SourceID provided by ARCA for each customer
NYSEProduct	NYSE product identifier used for recovery. Possible values are: 2 NYSE OpenBook Ultra 3 NYSE Quotes 4 NYSE Trades 9 NYSE Real-Time Reference Prices 11 NYSE Integrated Feed 51 NYSE MKT OpenBook Ultra 52 NYSE MKT Quotes 53 NYSE MKT Trades 57 NYSE MKT Real-Time Reference Prices 59 NYSE MKT Integrated Feed 151 NYSE ArcaBook 152 NYSE Arca BBO 153 NYSE Arca Trades 155 NYSE Arca Real-Time Reference Prices 157 NYSE Arca Integrated Feed
NYSEChannel	NYSE channel

Example

```
<channel> 0 0 lldt ac0 224.1.2.143:13042
172.27.6.114 - - - 159.125.74.166 52015
_SOURCE_ID_ 157 2 </channel>
```

6.3.6 config.gmac.markets.market.exchange-timestamp

Description Configures the reference timestamp transcoding.

When set, the ARCA XDP Source Time Reference message is transcoded into either GMACMessageTimeReference (when GMAC API version V1 is used) or GMACMessageTimeReferenceV3 (when GMAC API version V3 is used).

When not set, the ARCA XDP Source Time Reference message is not transcoded.

Usage

```
<exchange-timestamp> enbl </exchange-timestamp>
```

Parameters

enbl	Boolean which configures the timestamp transcoding Default is no.

Example

```
<exchange-timestamp> no </exchange-timestamp>
```

6.4 Arcabook for Options FAST/FIX

Tag config.gmac.markets.market ARCA_OPTIONS

6.4.1 config.gmac.markets.market.symbol-ref-file

Description Location of the symbol reference file, containing the SessionID and MappingIndex used for each Symbol in the book. This local file may be generated by GMAC, from the symbol reference information requested via TCP (see below).

Usage
```
<symbol-ref-file> symbFile </symbol-ref-file>
```

Parameters `symbFile` Location of the symbol reference file

Example
```
<symbol-ref-file> /tmp/ArcaSymIdx.20100902
</symbol-ref-file>
```

6.4.2 config.gmac.markets.market.write-symbol-ref-file

Description Symbol reference file destination. If this is specified, GMAC attempts to write the symbol reference file when the symbol reference information is received via TCP. If writing fails then an error is logged but processing continues. Any existing reference file with the same file name is not overwritten.

Usage
```
<write-symbol-ref-file> writeFile </ write-symbol-
ref-file>
```

Parameters `writeFile` Symbol reference file destination

Example
```
<write-symbol-ref-file> /tmp/ArcaSymIdx </ write-
symbol-ref-file>
```

6.4.3 config.gmac.markets.market.extension-messages

Description Enables the generation of extension messages, by default these are disabled.

Usage
```
<extension-messages> extMsgs </extension-messages>
```

Parameters `extMsgs` Boolean which enables/disables setting

Example
```
<extension-messages> on </extension-messages>
```

6.4.4 config.gmac.markets.market.recovery.channel

Description Configures a recovery channel for this market.

Usage
```
<channel> chanId numQueue plugin interface
srcIP:port enblRec startSeq useDumps recSrcIP
recSrcPort sourceID indxReq </channel>
```

Parameters

	`chanId`	See *Standard Multicast Channel Settings*
	`numQueue`	See *Standard Multicast Channel Settings*
	`plugin`	See *Standard Multicast Channel Settings*

`interface`	See *Standard Multicast Channel Settings*
`srcIP:port`	See *Standard Multicast Channel Settings*
`enblRec`	See *Standard Multicast Channel Settings*
`startSeq`	See *Standard Multicast Channel Settings*
`useDumps`	See *Standard Multicast Channel Settings*
`recSrcIP`	IP address of the TCP connection used to request retransmissions
`recSrcPort`	Port of the TCP connection used to request retransmissions
`sourceID`	SourceID provided by ARCA for each customer
`indxReq`	Enable index requesting for this multicast channel, typically enabled for quotes channels and disabled for trades channels

Example

```
<channel> 0 0 socket eth0 224.1.2.143:13042 - - -
159.125.74.166 52015 _SOURCE_ID_ yes </channel>
```

6.5 BATS Exchange (US and Europe)

Tag config.gmac.markets.market BATS

6.5.1 config.gmac.markets.market.remove-routed-trades

Description Disables the transcoding and publishing of all routed order executions and routed trades.

Usage `<remove-routed-trades> enbl </remove-routed-trades>`

Parameters

`enbl`	Boolean. Default is off.

Example `<remove-routed-trades> no </remove-routed-trades>`

6.5.2 config.gmac.markets.market.channels.channel

Description Configures a multicast channel for BATS. An additional parameter must be provided with the 'Unit' number to be handled by the multicast.

Note:

> Multicasts with more than one unit are not supported.

Usage `<channel> localChanId numQueue srcPlugin interface srcIP:port enblRec startSeq - unit </channel>`

Parameters

`localChanId`	See *Standard Multicast Channel Settings*
`numQueue`	See *Standard Multicast Channel Settings*
`srcPlugin`	See *Standard Multicast Channel Settings*
`interface`	See *Standard Multicast Channel Settings*
`srcIP:port`	See *Standard Multicast Channel Settings*
`enblRec`	See *Standard Multicast Channel Settings*
`startSeq`	See *Standard Multicast Channel Settings*
`unit`	Specifies the 'Unit' number. Available from the BATS specification.

Example `<channel> 2 0 lldt ac0 224.0.83.2:31203 - - - 3 </channel>`

6.5.3 config.gmac.markets.market.snapshot-enabled

Description Configures the snapshot/refresh recovery.

Usage `<snapshot-enabled> enbl </snapshot-enabled>`

Parameters

`enbl`	Boolean which enables or disables snapshot/refresh recovery

Example `<snapshot-enabled> no </snapshot-enabled>`

6.5.4 config.gmac.markets.market.snapshots.channel

Description Configures a snapshot channel for the market.

Usage
```
<channel> LocalChanId address port ssid username
password </channel>
```

Parameters

`LocalChanId`	The local id for this channel
`address`	IP address
`port`	Port for this channel
`ssid`	SessionSubID provided by BATS
`username`	Username provided by BATS
`password`	Password provided by BATS

Example
```
<channel> 0 95.130.109.64 18999 SESSION_SUB_ID
USERNAME PASSWORD </channel>
```

6.5.5 config.gmac.markets.market.grp

Description Configures a recovery group server

Usage
```
<grp> ssid host port username password </grp>
```

Parameters

`ssid`	SessionSubID provided by BATS
`host`	IP address
`port`	Port for this channel
`username`	Username provided by BATS
`password`	Password provided by BATS

Example
```
<grp> SESSION_SUB_ID 95.130.109.64 18999 USERNAME
PASSWORD </grp>
```

6.6 BGC eSpeed

Tag config.gmac.markets.market ESPEED

There are no market-specific configurations for BGC eSpeed, see Market Configuration Settings.

6.7 BME

Tag config.gmac.markets.market BME

There are no market-specific configurations for BME, see *Market Configuration Settings*.

6.8 Borsa Italiana Millennium

Tag config.gmac.markets.market BIT_MIL

6.8.1 config.gmac.markets.market.symbol-ref-file

Description This setting specifies the path to the symbol reference file, and is therefore only needed when reading symbol references from file.

Note:

> The path can also be a URL, in which case GMAC fetches the file using `wget` – also see standard *config.gmac.markets.market.symbol-ref-file* tag description.

Usage

```
<symbol-ref-file> file </symbol-ref-file>
```

Parameters

`file`	Location of the symbol reference file for the exchange

Example

```
<symbol-ref-file>
path/Instr_REFDATA_MTA_yyyymmdd.csv    </symbol-ref-
file>
```

6.9 CBOE Streaming Market

Tag config.gmac.markets.market CSM

There are no market-specific configurations for CBOE CSM, see *Market Configuration Settings*.

6.10 CBOE CFE

Tag config.gmac.markets.market CFE

There are no market-specific configurations for CBOE CFE, see *Market Configuration Settings*.

6.11 Chicago Mercantile Exchange CME

Tag config.gmac.markets.market CME2

6.11.1 config.gmac.markets.market.channels.channel

Description Configures a multicast channel for CME2. If a channel is enabled then a setting can be provided for `sqnSpin` to allow for spinning sequence numbers. CME sequence numbers spin on snapshot and instrument definition channels.

Usage

```
<channel> localChanId numQueue srcPlugin interface
srcIP:port enblRec startSeq useDumps enable
sqnSpin </channel>
```

Parameters

`localChanId`	See *Standard Multicast Channel Settings*
`numQueue`	See *Standard Multicast Channel Settings*
`srcPlugin`	See *Standard Multicast Channel Settings*
`interface`	See *Standard Multicast Channel Settings*
`srcIP:port`	See *Standard Multicast Channel Settings*
`enblRec`	See *Standard Multicast Channel Settings*
`startSeq`	See *Standard Multicast Channel Settings*
`useDumps`	See *Standard Multicast Channel Settings*
`enable`	Boolean which enables or disables the channel. This can also be done in the GMAC API using `GMACChannelEnable()`
`sqnSpin`	If set to spin, tells the decoder that sequence numbers spin on the channel, meaning the sequence numbers restart. If spin is not specified on a channel where the sequence numbers spin, GMAC stops delivering packets when the sequence number resets to zero

Example

```
<channel> 0 0 lldt ac0 224.0.26.3:10003 - - - on
spin </channel>
```

6.11.2 config.gmac.markets.market.snapshot-enabled

Description Configures the snapshot/refresh recovery.

Usage

```
<snapshot-enabled> enbl </snapshot-enabled>
```

Parameters

`enbl`	Boolean which enables or disables snapshot/refresh recovery

Example

```
<snapshot-enabled> no </snapshot-enabled>
```

6.11.3 config.gmac.markets.market.snapshots.channel

Description Configures a snapshot channel for CME2.

Usage

```
<channel> localChanId numQueue srcPlugin interface
srcIP:port enblRec startSeq useDumps enable
</channel>
```

Parameters

`localChanId`	See *Standard Multicast Channel Settings*
`numQueue`	See *Standard Multicast Channel Settings*
`srcPlugin`	See *Standard Multicast Channel Settings*

`interface`	See *Standard Multicast Channel Settings*
`srcIP:port`	See *Standard Multicast Channel Settings*
`enblRec`	See *Standard Multicast Channel Settings*
`startSeq`	See *Standard Multicast Channel Settings*
`useDumps`	See *Standard Multicast Channel Settings*
`enable`	Configures if the channel will start up enabled or disabled (default)

Example

```
<channel> 0 0 lldt ac0 224.0.26.21:10003 - - - on
</channel>
```

6.11.4 config.gmac.markets.market.extension-messages

Description Configures the generation of extension messages.

Usage

```
<extension-messages> extMsgs </extension-messages>
```

Parameters

`extMsgs`	Boolean which enables the generation of extension messages, by default these are disabled

Example

```
<extension-messages> on </extension-messages>
```

6.12 Consolidated Quotation System CQS

Tag config.gmac.markets.market CQS

There are no market-specific configurations for CQS, see *Market Configuration Settings*.

6.13 Consolidated Tape System CTS

Tag config.gmac.markets.market CTS

There are no market-specific configurations for CTS, see *Market Configuration Settings*.

6.14 Currenex ITCH

Tag config.gmac.markets.market CURRENEX

There are no market-specific configurations for CURRENEX, see *Market Configuration Settings*.

6.15 Direct Edge

Tag config.gmac.markets.market DIRECTEDGE

6.15.1 config.gmac.markets.market.channels.channel

Description Configures a multicast channel for Direct Edge.

Usage

```
<channel> localChanId numQueue srcPlugin interface
srcIP:port enblRec startSeq useDumps partition
</channel>
```

Parameters

`localChanId`	See *Standard Multicast Channel Settings*
`numQueue`	See *Standard Multicast Channel Settings*
`srcPlugin`	See *Standard Multicast Channel Settings*
`interface`	See *Standard Multicast Channel Settings*
`srcIP:port`	See *Standard Multicast Channel Settings*
`enblRec`	See *Standard Multicast Channel Settings*
`startSeq`	See *Standard Multicast Channel Settings*
`useDumps`	See *Standard Multicast Channel Settings*
`partition`	Configures which partition this channel is diverted to

Example

```
<channel> 0 0 lldt ac0 233.130.124.0:36001 - - - 1
</channel>
```

6.15.2 config.gmac.markets.market.tcp_server

Description Configures information on the TCP server.

Usage

```
<tcp_server>
```

Nested tokens

`<host>`	The host IP address for the TCP server
`<port>`	The port on the host server used for TCP
`<login>`	Login name used for the TCP server
`<pwd>`	Password for the TCP server

Example

```
<tcp_server>
   <host> 74.115.130.17 </host>
   <port> 36100 </port>
   <login> loginName </login>
   <pwd> password </pwd>
</tcp_server>
```

6.16 EUREX EBS

Tag config.gmac.markets.market EUREX

6.16.1 config.gmac.markets.market.channels.channel

Description Configures a multicast channel for Eurex.

Usage

```
<channel> localChanId numQueue srcPlugin interface
srcIP:port enblRec startSeq useDumps plFile
</channel>
```

Parameters

`localChanId`	See *Standard Multicast Channel Settings*
`numQueue`	See *Standard Multicast Channel Settings*
`srcPlugin`	See *Standard Multicast Channel Settings*
`interface`	See *Standard Multicast Channel Settings*
`srcIP:port`	See *Standard Multicast Channel Settings*
`enblRec`	See *Standard Multicast Channel Settings*
`startSeq`	See *Standard Multicast Channel Settings*
`useDumps`	See *Standard Multicast Channel Settings*
`plFile`	Filename for a text file containing a list of products

Example

```
<channel> 0 0 lldt ac0 224.0.26.3:10003 - - -
eurex_products.txt </channel>
```

6.16.2 config.gmac.markets.market.depth-mode

Description This setting allows the user to specify the types of book updates that GMAC should publish for Eurex.

Usage

```
<depth-mode> depthMode </depth-mode>
```

Parameters

`depthMode`	'normal' (default) will cause GMAC to only publish updates from Eurex levels 1 onwards (as levels 0 onwards in the GMAC API). 'best' will cause GMAC to only publish updates for Eurex level 0 (Top Of Book). 'all' will cause GMAC to publish all updates.

Example

```
<depth-mode> all </depth-mode>
```

6.16.3 config.gmac.markets.market.preferred-channel

Description Eurex specifies the preferred multicast to use for each product via the gateway location id in Eurex Product Reference messages.

GMAC will use the preferred multicast, or this setting allows the user to override the Eurex recommendation.

Usage

```
<preferred-channel> prefChan </preferred-channel>
```

Parameters

`prefChan`	0 or A	Use channel A
	1 or B	Use channel B
	G	Use the channel that the exchange recommends (default)
	P	Use the opposite channel that the exchange recommends

Example `<preferred-channel> G </preferred-channel>`

6.16.4 config.gmac.markets.market.symbol-ref-file

Description Location of the symbol reference file, which may be generated by GMAC from the symbol reference information received on the live reference channel (see notes on write-symbol-ref-file option, below). If this option is used, GMAC will read the reference data from the file specified instead of reading it from the live reference channel, making it possible to perform quick mid-day starts.

Note:

> If the file is malformed or incomplete, GMAC will issue a configuration error and quit.
>
> This option cannot be used simultaneously with write-symbol-ref-file (see below). Attempt to do so will result in a GMAC configuration error.

Usage `<symbol-ref-file> symbFile </symbol-ref-file>`

Parameters `symbFile` Location of the symbol reference file

Example
```
<symbol-ref-file> /tmp/EurexSymRef.20120902
</symbol-ref-file>
```

6.16.5 config.gmac.markets.market.write-symbol-ref-file

Description Symbol reference file destination. If this is specified, GMAC attempts to write the symbol reference file when the symbol reference information is received from the live reference channel. One complete cycle will be processed and written, unless the process is terminated prematurely or the feed is interrupted. Any existing reference file with the same file name is overwritten.

Note:

> This option cannot be used simultaneously with symbol-ref-file (see above). Attempt to do so will result in a GMAC configuration error.

Usage `<write-symbol-ref-file> symbFile </ write-symbol-ref-file>`

Parameters `symbFile` Symbol reference file destination

Example
```
<write-symbol-ref-file> /tmp/EurexSymRef.20120902
</ write-symbol-ref-file>
```

6.16.6 config.gmac.markets.market.preferred-interface

Description Allows users to specify the physical interfaces to use for the A and B channels.

The first interface given is used for the A channels, and the second is used for the B channels.

If this setting is not used, the same interface will be used for the A and B channels i.e. the interface specified for the reference channel.

The plugin to use for the A and B channels is still taken from the setting used for the reference channel. It is therefore not possible to use different plugins for the A and B channels.

Note:

> Using an invalid interface will generate an error.

Usage

```
<preferred-interface> interface_A interface_B
</preferred-interface>
```

Parameters

`Interface_A`	First interface used for the A channels
`Interface_B`	Second interface used for the B channels

Example

```
<preferred-interface> ac0 ac1 </preferred-
interface>
```

6.17 EUREX Enhanced MDI

Tag config.gmac.markets.market EUREX_EMDI

6.17.1 config.gmac.markets.market.snapshot-enabled

Description Configures the snapshot/refresh recovery.

When set, GMAC opens the snapshot channels.

Usage `<snapshot-enabled> enbl </snapshot-enabled>`

Parameters

`enbl`		Boolean which enables or disables snapshot/refresh recovery

Example `<snapshot-enabled> no </snapshot-enabled>`

6.17.2 config.gmac.markets.market.preferred-channel

Description Eurex specifies the preferred multicast to use for each product via the gateway location id in Eurex Product Reference messages.

GMAC will use the preferred multicast, or this setting allows the user to override the Eurex recommendation.

Usage `<preferred-channel> prefChan </preferred-channel>`

Parameters

`prefChan`	0 or A	Use channel A
	1 or B	Use channel B
	G	Use the channel that the exchange recommends (default)
	P	Use the opposite channel that the exchange recommends

Example `<preferred-channel> G </preferred-channel>`

6.17.3 config.gmac.markets.market.preferred-interface

Description Allows users to specify the physical interfaces to use for the A and B channels.

The first interface given is used for the A channels, and the second is used for the B channels.

If this setting is not used, the same interface will be used for the A and B channels i.e. the interface specified for the reference channel.

The plugin to use for the A and B channels is still taken from the setting used for the reference channel. It is therefore not possible to use different plugins for the A and B channels.

Note:

> Using an invalid interface will generate an error.

Usage `<preferred-interface> interface_A interface_B </preferred-interface>`

Parameters

`Interface_A`	First interface used for the A channels
`Interface_B`	Second interface used for the B channels

Example `<preferred-interface> ac0 ac1 </preferred-`

interface>

6.17.4 config.gmac.markets.market.channel-definition-file

Description Selects the preferred product types.

When the file is empty or this configuration is missing, GMAC will select all product types. The file is a white-space seperated list.

The product type comes from ParentMktSegmID [1325].

Product type examples: OSTK, OINX, FINX, FBND.

Usage `<channel-definition-file> FileName </channel-definition-file>`

Parameters `FileName` Channel definition file

Example `<channel-definition-file> ../eurex_emdi_products.txt </channel-definition-file>`

6.17.5 config.gmac.markets.market.extension-messages

Description Enables the generation of extension messages, by default these are disabled.

Usage `<extension-messages> extMsgs </extension-messages>`

Parameters `extMsgs` Boolean which enables/disables setting

Example `<extension-messages> on </extension-messages>`

6.17.6 config.gmac.markets.market.symbol-ref-file

Description Location of the symbol reference file, which may be generated by GMAC from the symbol reference information received on the live reference channel (see notes on write-symbol-ref-file option, below). If this option is used, GMAC will read the reference data from the file specified instead of reading it from the live reference channel, making it possible to perform quick mid-day starts, and will open the appropriate channels immediately.

Note #1:

> Usual time to receive complete reference data for simulation environment is less than 10 seconds, not counting the time needed for IGMP to get the data.

Note #2:

> If the file is malformed or incomplete, GMAC will issue a configuration error and quit.
>
> This option cannot be used simultaneously with write-symbol-ref-file (see below). Attempt to do so will result in a GMAC configuration error.

Usage `<symbol-ref-file> symbFile </symbol-ref-file>`

Parameters `symbFile` Location of the symbol reference file

Example `<symbol-ref-file> eurex_emdi </symbol-ref-file>`

6.17.7 config.gmac.markets.market.write-symbol-ref-file

Description Symbol reference file destination. If this is specified, GMAC attempts to write the symbol reference file when the symbol reference information is received from the live reference channel. One complete cycle will be processed and written, unless the process is terminated prematurely or the feed is interrupted. Any existing reference file with the same file name is overwritten.

Note:

> This option cannot be used simultaneously with symbol-ref-file (see above). Attempt to do so will result in a GMAC configuration error.

Usage
```
<write-symbol-ref-file> symbFile </ write-symbol-ref-file>
```

Parameters `symbFile` Symbol reference file destination

Example
```
<write-symbol-ref-file> eurex_emdi </ write-symbol-ref-file>
```

6.17.8 config.gmac.markets.market.version

Description The version of Eurex new trading architecture to be used, as specified in the Eurex Market and Reference Data Interfaces manual. If not specified the most recent version will be used.

Allowable values are:

- 1.2
- 1.3

Usage
```
<version> version </version>
```

Parameters `version` Eurex manual version

Example
```
<version> 1.3 </version>
```

6.18 EUREX MDI

Tag config.gmac.markets.market EUREX_MDI

6.18.1 config.gmac.markets.market.snapshot-enabled

Description Configures the snapshot/refresh recovery.

When set, GMAC opens the snapshot channels.

Usage `<snapshot-enabled> enbl </snapshot-enabled>`

Parameters `enbl` Boolean which enables or disables snapshot/refresh recovery

Example `<snapshot-enabled> no </snapshot-enabled>`

6.18.2 config.gmac.markets.market.preferred-channel

Description Eurex specifies the preferred multicast to use for each product via the gateway location id in Eurex Product Reference messages.

GMAC will use the preferred multicast, or this setting allows the user to override the Eurex recommendation.

Usage `<preferred-channel> prefChan </preferred-channel>`

Parameters `prefChan` 0 or A Use channel A

1 or B Use channel B

G Use the channel that the exchange recommends (default)

P Use the opposite channel that the exchange recommends

Example `<preferred-channel> G </preferred-channel>`

6.18.3 config.gmac.markets.market.preferred-interface

Description Allows users to specify the physical interfaces to use for the A and B channels.

The first interface given is used for the A channels, and the second is used for the B channels.

If this setting is not used, the same interface will be used for the A and B channels i.e. the interface specified for the reference channel.

The plugin to use for the A and B channels is still taken from the setting used for the reference channel. It is therefore not possible to use different plugins for the A and B channels.

Note:

> Using an invalid interface will generate an error.

Usage `<preferred-interface> interface_A interface_B </preferred-interface>`

Parameters `Interface_A` First interface used for the A channels

`Interface_B` Second interface used for the B channels

Example `<preferred-interface> ac0 ac1 </preferred-`

```
interface>
```

6.18.4 config.gmac.markets.market.channel-definition-file

Description Selects the preferred product types.

When the file is empty or this configuration is missing, GMAC will select all product types. The file is a white-space seperated list.

The product type comes from ParentMktSegmID [1325].

Product type examples: OSTK, OINX, FINX, FBND.

Usage

```
<channel-definition-file> FileName </channel-definition-file>
```

Parameters `FileName` Channel definition file

Example

```
<channel-definition-file> ../eurex-mdi_products.txt </channel-definition-file>
```

6.18.5 config.gmac.markets.market.extension-messages

Description Enables the generation of extension messages, by default these are disabled.

Usage

```
<extension-messages> extMsgs </extension-messages>
```

Parameters `extMsgs` Boolean which enables/disables setting

Example

```
<extension-messages> on </extension-messages>
```

6.18.6 config.gmac.markets.market.symbol-ref-file

Description Location of the symbol reference file, which may be generated by GMAC from the symbol reference information received on the live reference channel (see notes on write-symbol-ref-file option, below). If this option is used, GMAC will read the reference data from the file specified instead of reading it from the live reference channel, making it possible to perform quick mid-day starts, and will open the appropriate channels immediately.

Note #1:

> Usual time to receive complete reference data for simulation environment is less than 10 seconds, not counting the time needed for IGMP to get the data.

Note #2:

> If the file is malformed or incomplete, GMAC will issue a configuration error and quit.
>
> This option cannot be used simultaneously with write-symbol-ref-file (see below). Attempt to do so will result in a GMAC configuration error.

Usage

```
<symbol-ref-file> symbFile </symbol-ref-file>
```

Parameters `symbFile` Location of the symbol reference file

Example

```
<symbol-ref-file> eurex_mdi </symbol-ref-file>
```

6.18.7 config.gmac.markets.market.write-symbol-ref-file

Description Symbol reference file destination. If this is specified, GMAC attempts to write the symbol reference file when the symbol reference information is received from the live reference channel. One complete cycle will be processed and written, unless the process is terminated prematurely or the feed is interrupted. Any existing reference file with the same file name is overwritten.

Note:

> This option cannot be used simultaneously with symbol-ref-file (see above). Attempt to do so will result in a GMAC configuration error.

Usage
```
<write-symbol-ref-file> symbFile </ write-symbol-ref-file>
```

Parameters `symbFile` Symbol reference file destination

Example
```
<write-symbol-ref-file> eurex_mdi </ write-symbol-ref-file>
```

6.18.8 config.gmac.markets.market.version

Description The version of Eurex new trading architecture to be used, as specified in the Eurex Market and Reference Data Interfaces manual. If not specified the most recent version will be used.

Allowable values are:

- 1.2
- 1.3

Usage
```
<version> version </version>
```

Parameters `version` Eurex manual version

Example
```
<version> 1.3 </version>
```

6.19 HOTSPOT FX

Tag config.gmac.markets.market HOTSPOT

Hotspot Foreign Exchange is a TCP feed for currency pairs.

Instruments are in the form of Currency Pairs, e.g. “GBP/USD” to buy or sell a quantity of GBP for a price in USD.

Login credentials are included in the Channel configuration.

Note:

The ‘inverse’ pair “USD/GBP” is not supported

6.19.1 config.gmac.markets.market.channels.channel

Description Configures a multicast channel for Hotspot FX.

Usage

```
<channel> localChanId numQueue srcPlugin interface
srcIP:port:t - - - username passwd [mcastType]
</channel>
```

Parameters

`localChanId`	See *Standard Multicast Channel Settings*
`numQueue`	See *Standard Multicast Channel Settings*
`srcPlugin`	See *Standard Multicast Channel Settings*
`interface`	See *Standard Multicast Channel Settings*
`srcIP:port`	See *Standard Multicast Channel Settings*
`:t`	Specifies that this is a TCP multicast
`username`	Login username
`passwd`	Login password
`[mcastType]`	Either ‘new’ or ‘old’. The ‘new’ connections include the Lotsize and Minqty fields. Default ‘new’.

Example

```
<channel> 1 0 socket eth0 209.191.250.157:9013:t -
- - username passwd new </channel>
```

6.20 ICAP EBS

Tag config.gmac.markets.market ICAP

Note:

These settings are currently not supported

6.20.1 config.gmac.markets.market.credentials

Description Login credentials for the retransmission request server.

Usage

```
<credentials>
```

Nested tokens

`<sender>`	Username for the market feed
`<sendercompid>`	Password for the market feed

Example

```
<credentials>
   <sender> IcapCI </sender>
   <sendercompid> spartacus </sendercompid>
</credentials>
```

6.20.2 config.gmac.markets.market.backoff-period

Description Login credentials for the retransmission request server.

Usage

```
<backoff-period> period </backoff-period>
```

Parameters

`period`	Configures the number of seconds between retries if login fails

Example

```
<backoff-period> 10 </backoff-period>
```

6.20.3 config.gmac.markets.market.gateway-ip

Description Configures the gateway IP address, this should only be used if connecting through a gateway.

Usage

```
<gateway-ip> gatewayIp </gateway-ip>
```

Parameters

`gatewayIp`	IP address of the gateway

Example

```
<gateway-ip> 192.168.100.1 </gateway-ip>
```

6.21 ICAP XML

Tag config.gmac.markets.market ICAP_XML

6.21.1 config.gmac.markets.market.source-message-logfile

Description Enables or disables the raw XML messages dump to the default logging directory.

When enabled, one file per channel is created and is named ICAP_XML_channel_x.log for the channel x.

Usage

```
<source-message-logfile> enbl </source-message-logile>
```

Parameters

`enbl`	Boolean. Default is off.

Example

```
<source-message-logfile> on </source-message-logile>
```

6.22 Intercontinental Exchange ICE

Tag config.gmac.markets.market ICE

6.22.1 config.gmac.markets.market.channels.channel

Description Configures a multicast channel for ICE.

Usage

```
<channel> localChanId numQueue srcPlugin interface
srcIP:port enblRec startSeq useDumps enable
[mcastType] [mrktType] </channel>
```

Parameters

`localChanId`	See *Standard Multicast Channel Settings*
`numQueue`	See *Standard Multicast Channel Settings*
`srcPlugin`	See *Standard Multicast Channel Settings*
`interface`	See *Standard Multicast Channel Settings*
`srcIP:port`	See *Standard Multicast Channel Settings*
`enblRec`	See *Standard Multicast Channel Settings*
`startSeq`	See *Standard Multicast Channel Settings*
`useDumps`	See *Standard Multicast Channel Settings*
`Enable`	Boolean which enables or disables this channel on startup
`[mcastType]`	Either 'F' for a Futures multicast or 'O' for an Options multicast. Default is 'F'.
`[mrktType]`	A list of market-types on this multicast channel, for more information see www.theice.com

Example

```
<channel> 0 0 lldt ac0 233.156.208.255:20001 - - -
on F 26 28 29 39 40 </channel>
```

6.22.2 config.gmac.markets.market.snapshot-enabled

Description Configures the snapshot/refresh recovery.

Usage

```
<snapshot-enabled> enbl </snapshot-enabled>
```

Parameters

`enbl`	Boolean which enables or disables snapshot/refresh recovery

Example

```
<snapshot-enabled> no </snapshot-enabled>
```

6.22.3 config.gmac.markets.market.tcp_server

Description Configures information on the TCP server.

Usage

```
<tcp_server>
```

Nested tokens

`<host>`	The host IP address for the TCP server
`<port>`	The port on the host server used for TCP
`<login>`	Login name used for the TCP server
`<pwd>`	Password for the TCP server
`<tcp-recovery-`	Boolean which enables or disables the product definition

	enabled>	request. Default is on. Overrides the configuration node gmac.recovery.

Example

```
<tcp_server>
   <host> 63.247.113.163 </host>
   <port> 3000 </port>
   <login> celoxica_pf1 </login>
   <pwd> Starts123 </pwd>
   <tcp-recovery-enabled>    on    </tcp-recovery-
enabled>
</tcp_server>
```

6.22.4 config.gmac.markets.market.extension-messages

Description Configures the generation of extension messages.

Usage

```
<extension-messages> extMsgs </extension-messages >
```

Parameters		
	extMsgs	Boolean which enables the generation of extension messages, by default these are disabled

Example

```
<extension-messages> on </extension-messages>
```

6.23 International Securities Exchange ISE

Tag config.gmac.markets.market ISE_MDI

There are no market-specific configurations for ISE FAST feeds, see *Market Configuration Settings*.

6.24 International Securities Exchange ISE Binary

Tag config.gmac.markets.market ISE_MDI_BINARY

There are no market-specific configurations for ISE Binary feeds, see *Market Configuration Settings*.

6.25 ITCH BrokerTec

Tag config.gmac.markets.market ITCH_BROKERTEC

There are no market-specific configurations for ITCH_BROKERTEC, see *Market Configuration Settings*.

6.26 NASDAQ ITCH

Tag config.gmac.markets.market ITCH41

Note:

ITCH 4.1 hardware symbol filtering is only supported for one multicast per card.

Where more than one ITCH 4.1 market is used only one should have hardware symbol filtering enabled: this is achieved by disabling filtering on the other markets using the configuration node *config.gmac.markets.market.hardware-filtering*.

6.26.1 config.gmac.markets.market

Description Configures a market with integer id, plugin string name and string alias to identify the market.

Usage
```
<market> id name alias
```

Parameters

`Id`	Id of the market
`name`	Name of the market, must be ITCH41
`alias`	Alias for the market, if specified this is used to identify the market in the GMAC logs

Example
```
<market> 0 ITCH41 BOSTON
```

6.26.2 config.gmac.markets.market.recovery

Description Configures the recovery server

Usage <recovery>

Nested tokens

<host>	The host IP address for the TCP server
<port>	The port on the host server used for TCP

Example
```
<recovery>
   <host> 206.200.244.134 </host>
   <port> 36986 </port>
</recovery >
```

6.26.3 config.gmac.markets.market.snapshot-enabled

Description Configures the snapshot/refresh recovery.

Usage
```
<snapshot-enabled> enbl </snapshot-enabled>
```

Parameters

`enbl`	Boolean which enables or disables snapshot/refresh recovery

Example
```
<snapshot-enabled> no </snapshot-enabled>
```

6.26.4 config.gmac.markets.market.snapshots.channel

Description Configures a snapshot channel for this market.

Note:

> `localChanId` must match the `localChanId` in `config.gmac.markets.market.channels.channel`.

Usage

```
<channel> localChanId tcpServerIp tcpServerPort
username password </channel>
```

Parameters

`localChanId`	Snapshot channel, must be unique for the market
`tcpServerIp`	Address for the snapshot channel
`tcpServerPort`	Port for the snapshot channel
`username`	Username for the snapshot channel
`password`	Password for the snapshot channel

Example

```
<channel> 0 206.200.244.134 60012 user pass
</channel>
```

6.27 LIFFE US XDP

Tag config.gmac.markets.market XDPUS

6.27.1 config.gmac.markets.market.channels.channel

Description Configures a multicast channel for Liffe US XDP.

Usage

```
<channel> localChanId numQueue srcPlugin interface
srcIP:port:type enblRec startSeq useDumps chanType
</channel>
```

Parameters

`localChanId`	See *Standard Multicast Channel Settings*
`numQueue`	See *Standard Multicast Channel Settings*
`srcPlugin`	See *Standard Multicast Channel Settings*
`interface`	See *Standard Multicast Channel Settings*
`srcIP:port`	See *Standard Multicast Channel Settings*
`type`	The type of connection for the channel, t for TCP and u for UDP
`enblRec`	See *Standard Multicast Channel Settings*
`startSeq`	See *Standard Multicast Channel Settings*
`useDumps`	See *Standard Multicast Channel Settings*
`chanType`	The type of channel 'ref' for standing data channel. '-' for live / updates channels.

Example

```
Live / updates channel:

<channel> 0 0 lldt ac0 224.0.60.240:31022:u - - -
- </channel>


Standing data channel:

<channel> 0 0 lldt ac0 224.0.60.242:31024:u - - -
ref </channel>
```

6.27.2 config.gmac.markets.market.depth-mode

Description This setting allows the user to specify the types of book updates that GMAC should publish for Liffe US XDP.

Usage

```
<depth-mode> depthMode </depth-mode>
```

Parameters

`depthMode`	'normal' (default) will cause GMAC to only publish bid/ask with level not set. 'best' will cause GMAC to only publish best bid/ask with level 0. 'all' will cause GMAC to publish all updates.

Example

```
<depth-mode> all </depth-mode>
```

6.27.3 config.gmac.markets.market.symbol-ref-file

Description This setting specifies the location of the FIXML reference files provided by the exchange, and is only needed when reading symbol references from file.

Note:

> The parameter can also be a URL or a script that downloads the files and outputs the file list for GMAC to process – see standard *config.gmac.markets.market.symbol-ref-file* tag description.

Usage `<symbol-ref-file> file </symbol-ref-file>`

Parameters `file` Location of the symbol reference file for the exchange

Example

```
<symbol-ref-file>
path/nyseliffe_stdata_C_030113.xml </symbol-ref-
file>
```

Example script provided with the installation:

```
<symbol-ref-file>
cmd://celoxica_get_liffexdp_us_refdata.sh </symbol-
ref-file>
```

6.27.4 config.gmac.markets.market.extension-messages

Description Configures the generation of extension messages.

Usage `<extension-messages> extMsgs </extension-messages>`

Parameters `extMsgs` Boolean which enables the generation of extension messages, by default these are disabled

Example `<extension-messages> on </extension-messages>`

6.28 LIFFE XDP

Tag config.gmac.markets.market XDP

6.28.1 config.gmac.markets.market.channels.channel

Description Configures a multicast channel for Liffe XDP.

Usage

```
<channel> localChanId numQueue srcPlugin interface
srcIP:port:type enblRec startSeq useDumps chanType
</channel>
```

Parameters

`localChanId`	See *Standard Multicast Channel Settings*
`numQueue`	See *Standard Multicast Channel Settings*
`srcPlugin`	See *Standard Multicast Channel Settings*
`interface`	See *Standard Multicast Channel Settings*
`srcIP:port`	See *Standard Multicast Channel Settings*
`type`	The type of connection for the channel, t for TCP and u for UDP
`enblRec`	See *Standard Multicast Channel Settings*
`startSeq`	See *Standard Multicast Channel Settings*
`useDumps`	See *Standard Multicast Channel Settings*
`chanType`	The type of channel 'ref' for standing data channel. '-' for live / updates channels.

Example

```
Live / updates channel:

<channel> 0 0 lldt ac0 224.0.64.47:50001:u - - - -
</channel>


Standing data channel:

<channel> 0 0 lldt ac0 224.0.64.47:50001:u - - -
ref </channel>
```

6.28.2 config.gmac.markets.market.recovery.channel

Description Configures a recovery channel for the market.

Usage

```
<channel> chanId numQueue plugin interface
recIP:port enblRec startSeq useDumps svcID
sourceID </channel>
```

Parameters

`ChanId`	See *Standard Multicast Channel Settings*
`numQueue`	See *Standard Multicast Channel Settings*
`plugin`	See *Standard Multicast Channel Settings*
`interface`	See *Standard Multicast Channel Settings*
`recIP:port`	See *Standard Multicast Channel Settings*
`enblRec`	See *Standard Multicast Channel Settings*
`startSeq`	See *Standard Multicast Channel Settings*
`useDumps`	See *Standard Multicast Channel Settings*
`svcID`	Service ID which refers to a market segment, this is specified by Liffe

Note:

The Service ID for recovery and refresh is the live Service ID.

`sourceID` Source ID supplied by Liffe

Example `N / A`

6.28.3 config.gmac.markets.market.connect-wait-sec

Description Configures the number of seconds to allow for a recovery connection.

Usage `<connect-wait-sec> waitSec </connect-wait-sec>`

Parameters `waitSec` Number of seconds to allow for a recovery connection

Example `<connect-wait-sec> 3 </connect-wait-sec>`

6.28.4 config.gmac.markets.market.depth-mode

Description This setting allows the user to specify the types of book updates that GMAC should publish for Liffe XDP.

Usage `<depth-mode> depthMode </depth-mode>`

Parameters `depthMode` 'normal' (default) will cause GMAC to only publish bid/ask with level not set.

'best' will cause GMAC to only publish best bid/ask with level 0.

'all' will cause GMAC to publish all updates.

Example `<depth-mode> all </depth-mode>`

6.28.5 config.gmac.markets.market.symbol-ref-file

Description This setting specifies the location of the FIXML reference files provided by the exchange, and is only needed when reading symbol references from file.

Note:

The parameter can also be a URL or a script that downloads the files and outputs the file list for GMAC to process – see standard *config.gmac.markets.market.symbol-ref-file* tag description.

Usage `<symbol-ref-file> file </symbol-ref-file>`

Parameters `file` Location of the symbol reference file for the exchange

Example

```
<symbol-ref-file> path/SymbolMap.xml </symbol-
ref-file>
```

```
<symbol-ref-file>
ftp://ftp.nysedata.com/OpenBook/SymbolMapping/SymbolMap.xml
</symbol-ref-file>
```

```
Example script provided with the installation:
```

```
<symbol-ref-file>
cmd://celoxica_get_liffexdp_refdata.sh
</symbol-ref-file>
```

6.28.6 config.gmac.markets.market.extension-messages

Description Configures the generation of extension messages.

Usage `<extension-messages> extMsgs </extension-messages>`

Parameters

`extMsgs`	Boolean which enables the generation of extension messages, by default these are disabled

Example

```
<extension-messages> on </extension-messages>
```

6.29 LSE Infolect

Tag config.gmac.markets.market LSE

6.29.1 config.gmac.markets.market

Description Configures a market with integer id, plugin string name and string alias to identify the market.

Usage
```
<market> id name alias
```

Parameters

`Id`	Id of the market
`name`	Name of the market, must be LSE
`alias`	Alias for the market, if specified this is used to identify the market in the GMAC logs

Example
```
<market> 0 LSE BIT
```

6.29.2 config.gmac.markets.market.channels.channel

Description Configures a multicast channel for LSE.

Usage
```
<channel> localChanId numQueue srcPlugin interface
srcIP:port enblRec startSeq useDumps code
</channel>
```

Parameters

`localChanId`	See *Standard Multicast Channel Settings*
`numQueue`	See *Standard Multicast Channel Settings*
`srcPlugin`	See *Standard Multicast Channel Settings*
`interface`	See *Standard Multicast Channel Settings*
`srcIP:port`	See *Standard Multicast Channel Settings*
`enblRec`	See *Standard Multicast Channel Settings*
`startSeq`	See *Standard Multicast Channel Settings*
`useDumps`	See *Standard Multicast Channel Settings*
`code`	Code used to identify this channel

Example
```
<channel> 0 0 lldt ac0 224.4.0.4:60500 off
undefined - Pa1 </channel>
```

6.29.3 config.gmac.markets.market.recovery.host

Description Configures the local recovery server host.

Usage
```
<host> recServer </host>
```

Parameters

`recServer`	The local recovery server host

Example
```
<host> recovery-server </host>
```

6.29.4 config.gmac.markets.market.recovery.port

Description Configures the port on the recovery server used for recovery.

Usage `<port> recPort </port>`

Parameters

`recPort`	The port on the recovery server used for recovery

Example `<port> 514 </port>`

6.29.5 config.gmac.markets.market.recovery.usap

Description Configures the USAP.

Usage `<usap> USAP </usap>`

Parameters

`USAP`	The USAP supplied by LSE for each customer. The recovery server matches this and the participant-code to authenticate login to the server

Example `<usap> 514 </usap>`

6.29.6 config.gmac.markets.market.recovery.participant-code

Description Configures the participant code.

Usage `<participant-code> pCode </ participant-code>`

Parameters

`pCode`	The participant code supplied by LSE for each user

Example `<participant-code> participantcode </ participant-code>`

6.29.7 config.gmac.markets.market.recovery.timeout-base

Description Configures the base timetout.

Usage `<timeout-base> tBase </timeout-base>`

Parameters

`tBase`	The base timeout in milliseconds

Example `<timeout-base> 30000 </timeout-base>`

6.29.8 config.gmac.markets.market.recovery.timeout-rate

Description Configures the timeout rate.

Usage `<timeout-rate> tRate </timeout-rate>`

Parameters

`tRate`	The timeout rate in milliseconds

Example `<timeout-rate> 700 </timeout-rate>`

6.29.9 config.gmac.markets.market.time-to-retry

Description Configures the time to wait for a task to retry.

Usage `<time-to-retry> tRetry </time-to-retry>`

Parameters

`tRetry`	The number of milliseconds to wait for a task to retry

Example `<time-to-retry> 8000 </time-to-retry>`

6.29.10 config.gmac.markets.market.recovery.timeout-connect

Description Configures the time to allow for recovery connection.

Usage `<timeout-connect> tConnect </timeout-connect>`

Parameters

`tConnect`	The number of milliseconds to allow for recovery connection

Example `<timeout-connect> 5000 </timeout-connect>`

6.29.11 config.gmac.markets.market.periods

Description Enables the mapping of trading period strings to GMAC trading status codes.

Currently used for LSE Infolect only.

Usage `<periods>`

Parameters `N / A`

Example `N / A`

6.29.12 config.gmac.markets.market.periods.period

Description Maps an exchange specific trading period to a GMAC period status code.

Currently this configuration node is only used for LSE Infolect, for which the trading period names are published in market configuration matrix TIS105.

The status code of the period can be one of the following characters:

Period Status Code	Description
A	Auction call/match
C	Continuous trading
H	Halt
X	No action
M	MO extension
P	PM extension
S	Suspended
I	Indicative

Usage `<period> prdTag prdName prdStatus </period>`

Parameters

`prdTag`	Tag for each `<period>` entry, this MUST be unique. Not internally processed.
`prdName`	The name of the trading period, given in TIS105 for LSE Infolect
`prdStatus`	The name of the trading period, given in TIS105 for LSE Infolect

Example

```
<period> 0 ACC A </period>
<period> 1 ACCX A </period>
```

6.30 LSE Millennium

Tag config.gmac.markets.market LSE_MIL

This market has UDP feed multicasts with separate TCP connections for Retransmissions (replay or gap-filling) and for Snapshots (refresh). The retransmitted data is received over the TCP connections. The Snapshots connection can also be used to get Index-Mapping.

6.30.1 config.gmac.markets.market

Description Configures a market with integer id, plugin string name and string alias to identify the market.

Usage `<market> id name alias`

Parameters

`Id`	Id of the market
`name`	Name of the market, must be LSE_MIL
`alias`	Alias for the market, if specified this is used to identify the market in the GMAC logs If this is a 3 character value this is used as the EISIN prefix e.g. the example below produces an EISIN of MBIT

Example `<market> 0 LSE_MIL BIT`

6.30.2 config.gmac.markets.market.symbol-ref-file

Description This setting specifies the path to the symbol reference file, and is therefore only needed when reading symbol references from file.

Note:

> The path can also be a URL, in which case GMAC fetches the file using `wget` – also see standard *config.gmac.markets.market.symbol-ref-file* tag description.

Usage `<symbol-ref-file> file </symbol-ref-file>`

Parameters

`file`	Location of the symbol reference file for the exchange

Example

```
<symbol-ref-file>    path/%Y%m%d_XLON_Instrument.csv
</symbol-ref-file>

<symbol-ref-file>
ftp://USER:PASS@194.169.8.155:21/%Y%m%d_XLON_Instrument.csv
</symbol-ref-file>
```

6.30.3 config.gmac.markets.market.snapshot-enabled

Description Configures the snapshot/refresh recovery.

Usage `<snapshot-enabled> enbl </snapshot-enabled>`

Parameters

`enbl`	Boolean which enables or disables snapshot/refresh recovery

Example `<snapshot-enabled> no </snapshot-enabled>`

6.30.4 config.gmac.markets.market.snapshots.channel

Description Configures a TCP snapshot channel for requesting refreshes and snapshots from the market.

Usage
```
<channel> chanId numQueue - - recIP:port - - -
CompId Password </channel>
```

Parameters

`chanId`	The local id for this channel, must match the equivalent recovery channel for this market
`numQueue`	The DMA queue number, must match the equivalent recovery DMA queue for this market
`recIP:port`	The IP address and port of the TCP connection used for requesting snapshots and refreshes
`CompId`	The comp ID provided by LSEM
`Password`	The password provided by LSEM

Example
```
<channel> 0 0 - - 224.0.62.3:30001 - - - compid
password </channel>
```

6.30.5 config.gmac.markets.market.extension-messages

Description Configures the generation of extension messages.

Usage
```
<extension-messages> extMsgs </extension-messages>
```

Parameters

`extMsgs`	Boolean which enables the generation of extension messages, by default these are disabled

Example
```
<extension-messages> on </extension-messages>
```

6.30.6 config.gmac.markets.market.firm-quote

Description When enabled, the firm quote flagged messages will be transcoded.

When disabled, the firm quote flagged messages will be ignored.

Usage
```
<firm-quote> FirmQuote </firm-quote>
```

Parameters

`FirmQuote`	Boolean

Example
```
<firm-quote> off </firm-quote>
```

6.31 NYSE

Tag config.gmac.markets.market NYSE

This plugin supports the following NYSE feeds:

- OpenBook Ultra
- Alerts
- Order Imbalances

This market has UDP feed multicasts, each with a TCP connection for Retransmissions (replay or gap-filling) and for Snapshots (refresh). The retransmitted data is received over additional multicasts for Retransmissions and for Snapshots (and index-mapping). Index-Mapping is also received on the Snapshots multicast.

6.31.1 config.gmac.markets.market.source-id

Description Configures the source id.

Usage `<source-id> sid </source-id>`

Parameters `sid` The source id provided by NYSE for each customer

Example `<source-id> foo </source-id>`

6.31.2 config.gmac.markets.market.symbol-ref-file

Description This setting configures the path to the symbol reference file; this is only needed when reading symbol references from file.

Note:

> The parameter can also be a URL – also see standard *config.gmac.markets.market.symbol-ref-file* tag description.

Usage `<symbol-ref-file> file </symbol-ref-file>`

Parameters `file` Location of the symbol reference file for the exchange

Example

```
<symbol-ref-file> path/SymbolMap.xml </symbol-ref-file>

<symbol-ref-file>
ftp://ftp.nysedata.com/OpenBook/SymbolMapping/SymbolMap.xml
</symbol-ref-file>
```

6.31.3 config.gmac.markets.market.channels.channel

Description Configures a multicast channel for NYSE.

Usage

```
<channel> localChanId numQueue srcPlugin interface
srcIP:port enblRec startSeq useDumps prId
</channel>
```

Parameters

`localChanId` See *Standard Multicast Channel Settings*

`numQueue` See *Standard Multicast Channel Settings*

srcPlugin	See *Standard Multicast Channel Settings*
interface	See *Standard Multicast Channel Settings*
srcIP:port	See *Standard Multicast Channel Settings*
enblRec	See *Standard Multicast Channel Settings*
startSeq	See *Standard Multicast Channel Settings*
useDumps	See *Standard Multicast Channel Settings*
prId	Product ID supplied by NYSE. Possible values are: 104 NYSE Alerts feed 115 NYSE OpenBookUltra feed 116 NYSE Order Imbalances feed

Example `<channel> 0 0 lldt ac0 224.0.26.3:10003 - - - on spin </channel>`

6.31.4 config.gmac.markets.market.recovery.timeout-connect

Description Configures the time to allow for recovery connection.

Usage `<timeout-connect> tConnect </timeout-connect>`

Parameters

tConnect	The number of milliseconds to allow for recovery connection

Example `<timeout-connect> 5000 </timeout-connect>`

6.31.5 config.gmac.markets.market.get-index-map

Description Enables the retrieval of index mapping messages for OpenBook Ultra.

If enabled they will be requested once the heartbeat has been exchanged on the TCP connection (provided the snapshot multicast is configured).

Usage `N / A`

Parameters `N / A`

Example `<get-index-map> on </get-index-map>`

6.31.6 config.gmac.markets.market.exchange-timestamp

Description Selects the exchange field that will be used to populate the ExchangeTimestamp in GMAC messages (GMACMessageHeader.ExchangeTimestamp).

Usage `<exchange-timestamp> timestamps </exchange-timestamp>`

Parameters

timestamps	Boolean which enables use of the SourceTime fields (where available) for timestamps, by default uses the SendTime fields

Example `<exchange-timestamp> on </exchange-timestamp>`

6.31.7 config.gmac.markets.market.ignore-slow-quote

Description Enabling this causes all quotes for an instrument in a 'slow quote' state (from the QuoteCondition field) to be dropped by GMAC. This may affect the orders on either or both sides. Additionally all levels will be deleted for the affected side(s).

Levels will be forwarded again if the condition goes away, but only if the exchange sends them (i.e. unchanged orders are likely to be lost).

By default this setting is disabled, meaning that all orders are forwarded.

Usage `N / A`

Parameters `N / A`

Example `<ignore-slow-quote> on </ignore-slow-quote>`

6.31.8 config.gmac.markets.market.drop-unknown-instruments

Description Enables the dropping of OB messages for unknown instruments. **This option is not recommended**, if index mapping is not available then **all** OB update messages are dropped.

Please use correct reference data files where possible.

Usage `<drop-unknown-instruments> dropInst </drop-unknown-instruments>`

Parameters `dropInst` Boolean which enables dropping of OB message from unknown instruments.

Default is off.

Example `<drop-unknown-instruments> off </drop-unknown-instruments>`

6.31.9 config.gmac.markets.market.trades-enabled

Description Enables or disables the generation of the trade messages.

When set, the trades messages are forwarded to the user.

By default, the trade messages are not generated.

Usage `<trades-enabled> enbl </trades-enabled>`

Parameters `enbl` Boolean which enables or disables the trade messages

Example `<trades-enabled> no </trades-enabled>`

6.32 NYSE Euronext

Tag config.gmac.markets.market EURONEXT

There are no market-specific configurations for NYSE Euronext, see *Market Configuration Settings*.

6.33 NYSE XDP

Tag config.gmac.markets.market NYSE_XDP

This plugin supports the NYSE XDP Trades feed.

6.33.1 config.gmac.markets.market.symbol-ref-file

Description This setting configures the path to the symbol reference file; this is only needed when reading symbol references from file.

Note:

> The parameter can also be a URL – also see standard *config.gmac.markets.market.symbol-ref-file* tag description.

Usage

```
<symbol-ref-file> file </symbol-ref-file>
```

Parameters

`file`	Location of the symbol reference file for the exchange

Example

```
<symbol-ref-file>    path/NYSESymbolMapping_NMS.XML
</symbol-ref-file>

<symbol-ref-file>
ftp://ftp.nyxdata.com/NYSESymbolMapping/NYSESymbolMapping_NMS.
XML
</symbol-ref-file>
```

6.33.2 config.gmac.markets.market.exchange-timestamp

Description Configures the SourceTime field use.

Usage

```
<exchange-timestamp> timestamps </exchange-
timestamp>
```

Parameters

`timestamps`	Boolean which enables use of the SourceTime fields (where available) for timestamps, by default uses the SendTime fields

Example

```
<exchange-timestamp> on </exchange-timestamp>
```

6.34 Options Price Reporting Authority OPRA

Tag config.gmac.markets.market OPRA

There are no market-specific configurations for OPRA, see *Market Configuration Settings*.

6.35 Options Price Reporting Authority OPRA Binary

Tag config.gmac.markets.market OPRA_BINARY

There are no market-specific configurations for OPRA_BINARY, see *Market Configuration Settings*.

6.36 OSLO Millennium

Tag config.gmac.markets.market OSLO_MIL

6.36.1 config.gmac.markets.market.symbol-ref-file

Description This setting specifies the path to the symbol reference file, and is therefore only needed when reading symbol references from file.

Note:

> The path can also be a URL, in which case GMAC fetches the file using `wget` – also see standard *config.gmac.markets.market.symbol-ref-file* tag description.

Usage

```
<symbol-ref-file> file </symbol-ref-file>
```

Parameters

`file`	Location of the symbol reference file for the exchange

Example

```
<symbol-ref-file>
path/YYYYMMDD_XOSL_Instrument_Delta.csv </symbol-
ref-file>
```

6.37 PHLX Order Plus

Tag config.gmac.markets.market PHLXTOPOPLUS

There are no market-specific configurations for PHLX Order Plus, see *Market Configuration Settings*.

6.38 PICO Radio Frequency

Tag config.gmac.markets.market PICO_RF

There are no market-specific configurations for PICO Radio Frequency, see *Market Configuration Settings*

6.39 Top of PHLX Options (TOPO)

Tag config.gmac.markets.market PHLXTOPOV3

There are no market-specific configurations for Top of PHLX Options, see *Market Configuration Settings*.

6.40 Toronto Stock Exchange TSX

Tag config.gmac.markets.market TSX

6.40.1 config.gmac.markets.market.maxsymbols

Description Configures the maximum number of Symbols which can be supported, the plugin fails if more are encountered.

The example below allocates an array of 4000 symbols.

Usage
```
<maxsymbols> max </maxsymbols>
```

Parameters

max	The number of symbols supported by the exchange

Example
```
<maxsymbols> 4000 </maxsymbols>
```

6.40.2 config.gmac.markets.market.exchange-timestamp

Description Configures the generation of exchange timestamps.

Usage
```
<exchange-timestamp> timestamps </exchange-timestamp>
```

Parameters

timestamps	Boolean which enables the generation of exchange timestamps, by default these are disabled

Example
```
<exchange-timestamp> on </exchange-timestamp>
```

6.40.3 config.gmac.markets.market.extension-messages

Description Configures the generation of extension messages.

Usage
```
<extension-messages> extMsgs </extension-messages>
```

Parameters

extMsgs	Boolean which enables the generation of extension messages, by default these are disabled

Example
```
<extension-messages> on </extension-messages>
```

6.40.4 config.gmac.markets.market.channels.channel

Description Configures a multicast channel for TSX.

Usage
```
<channel> localChanId numQueue srcPlugin interface
srcIP:port enblRec startSeq useDumps hexAddress
</channel>
```

Parameters

localChanId	See *Standard Multicast Channel Settings*
numQueue	See *Standard Multicast Channel Settings*
srcPlugin	See *Standard Multicast Channel Settings*
interface	See *Standard Multicast Channel Settings*
srcIP:port	See *Standard Multicast Channel Settings*
enblRec	See *Standard Multicast Channel Settings*
startSeq	See *Standard Multicast Channel Settings*
useDumps	See *Standard Multicast Channel Settings*

	`hexAddress`	Hexadecimal destination address to embed in messages, this is supplied by TSX

Example

```
<channel> 0 0 lldt ac0 233.102.209.68:37610 - - -
00101012 </channel>
```

6.40.5 config.gmac.markets.market.recovery

Configures gap-recovery links for each multicast in the config.gmac.markets.market.channels node. In TSX, use the links under this tag to configure the 'regular' gap-recovery channels and use links under node config.gmac.markets.markets.long-recovery for the 'long' gap-recovery channels - see below. Also see below for details on individual link configuration.

6.40.6 config.gmac.markets.market.long-recovery

Configures gap-recovery links for each multicast in the config.gmac.markets.market.channels node. In TSX, use the links under this tag to configure the 'long' gap-recovery channels and use links under node config.gmac.markets.markets.recovery for the 'regular' gap-recovery channels - see above. Also see below for details on individual link configuration.

6.40.7 config.gmac.markets.market.recovery.link and config.gmac.markets.market.long-recovery.link

Description Configures a gap-recovery link for TSX, associated with a multicast described by a config.gmac.markets.market.channels.channel node.

Usage

```
<link> chanId numQueue plugin interface recIP:port
enblRec startSeq useDumps passwd feedStampAddr
userStampAddr recStampAddr </link>
```

Parameters

`ChanId`	See *Standard Multicast Channel Settings*
`numQueue`	See *Standard Multicast Channel Settings*
`plugin`	See *Standard Multicast Channel Settings*
`interface`	See *Standard Multicast Channel Settings*
`recIP:port`	See *Standard Multicast Channel Settings*
`enblRec`	See *Standard Multicast Channel Settings*
`startSeq`	See *Standard Multicast Channel Settings*
`useDumps`	See *Standard Multicast Channel Settings*
`passwd`	Password, needed for sign-in and authentication
`feedStampAddr`	Hex feed Stamp address to embed as ResendSource in Recovery Request messages, supplied by TSX
`userStampAddr`	Hex recovery user Stamp address to embed as SourceAddress in outgoing Recovery messages, supplied by TSX
`recStampAddr`	Hex recovery Stamp address to embed as DestAddress in outgoing Recovery messages, supplied by TSX

Example

```
<link> 0 0 - - 142.201.223.21:10861 - - - PASSWORD
00101012 09002402 00000024 </link>
```

6.40.8 config.gmac.markets.market.get-index-map

Description If this is enabled, the plugin will attempt to recover the early morning messages from the server. These include the Trading Tier Status Message and the Symbol Status Feed Messages. The Trading Tier Status Message is sequence number 1 and includes the number, N, of symbols (number of Status Feed Messages). These are sequence numbers 2 to N+1.

If enabled, these messages will be requested from the server, and any live messages which are received before the recovery is complete will be ignored. When the messages have been recovered, normal operation continues using the supplied `startSeq` value (which may try to recover other messages, or may continue with the new live messages.

Note:

This feature is enabled by default.

Usage `<get-index-map> enable </get-index-map>`

Parameters

`enable`	Boolean setting to enable or disable this feature

Example `<get-index-map> on </get-index-map>`

6.40.9 config.gmac.markets.market.max-reg-gap

Description If both 'regular' and 'long' gap-recovery channels are configured, sets the maximum sequence number age for gaps to be filled using the 'regular' gap-recovery channels. That is, if the difference between the last sequence number seen and the sequence number being requested is equal to or less than the value given, the request will be sent over the 'regular' gap-recovery channel(s). Otherwise it will be sent over the 'long' channel(s).

If gap-recovery channels of only one type are configured (either regular or long), they will be used and this setting will have no effect.

Usage `<max-reg-gap> max-seq-age </max-reg-gap>`

Parameters

`max-seq-age`	Configures the maximum sequence number age for gaps to be filled using the 'regular' recovery channels

Example <max-reg-gap> 100000 </max-reg-gap>

6.40.10 config.gmac.markets.market.backoff-period

Description Configures the time between retries if login fails.

Usage `<backoff-period> period </backoff-period>`

Parameters

`period`	Configures the number of seconds between retries if login fails

Example `<backoff-period> 10 </backoff-period>`

6.40.11 config.gmac.markets.market.credentials

Description Configures the credentials for the recovery server.

Note:

If `keyid` or `deskey` are supplied incorrectly, error messages are generated but processing continues.

Usage `<credentials>`

Nested tokens

`<keyid>`	The key ID supplied by TSX
`<deskey>`	The DESkey supplied by TSX
`<operatingenvironment>`	One of "Acceptance", "Development", "Production" or "Test"

Example

```
<credentials>
   <keyid> 250 </keyid>
   <deskey> INOKLTWETHEINHWEIAKCNTHD </deskey>
   <operatingenvironment> Production
</operatingenvironment>
</credentials>
```

6.41 Turquoise Millennium

Tag config.gmac.markets.market TURQUOISE_MIL

6.41.1 config.gmac.markets.market.symbol-ref-file

Description This setting specifies the path to the symbol reference file, and is therefore only needed when reading symbol references from file.

Note:

> The path can also be a URL, in which case GMAC fetches the file using `wget` – also see standard *config.gmac.markets.market.symbol-ref-file* tag description.

Usage

```
<symbol-ref-file> file </symbol-ref-file>
```

Parameters

`file`	Location of the symbol reference file for the exchange

Example

```
<symbol-ref-file>    path/%Y%m%d_TRQX_Instrument.csv
</symbol-ref-file>
```

```
<symbol-ref-file>
ftp://USER:PASS@80.85.68.103/%Y%m%d_XLON_Instrument.csv
</symbol-ref-file>
```

6.42 UTP Quote Data Feed UQDF

Tag config.gmac.markets.market UQDF

6.42.1 config.gmac.markets.market.symbol-ref-file

Description This setting configures the path to the symbol reference file; this is only needed when reading symbol references from file.

Note:

> The parameter can also be a URL – also see standard *config.gmac.markets.market.symbol-ref-file* tag description.

Usage

```
<symbol-ref-file> file </symbol-ref-file>
```

Parameters

`file`	Location of the symbol reference file for the exchange

Example

```
<symbol-ref-file> path/nasdaqlisted.txt </symbol-
ref-file>
```

```
<symbol-ref-file>
ftp://ftp.nasdaqtrader.com/symboldirectory/nasdaqlisted.txt
</symbol-ref-file>
```

6.43 UTP Trade Data Feed UTDF

Tag config.gmac.markets.market UTDF

There are no market-specific configurations for UTDF, see *Market Configuration Settings*.

6.44 XETRA

Tag config.gmac.markets.market XETRA

6.44.1 config.gmac.markets.market.snapshot-enabled

Description Configures the snapshot/refresh recovery.

When set, GMAC opens the snapshot channels.

Usage `<snapshot-enabled> enbl </snapshot-enabled>`

Parameters

`enbl`	Boolean which enables or disables snapshot/refresh recovery

Example `<snapshot-enabled> no </snapshot-enabled>`

6.44.2 config.gmac.markets.market.trades-enabled

Description Enables or disables the trade channels.

When set, GMAC opens the trade channels.

Usage `<trades-enabled> enbl </trades-enabled>`

Parameters

`enbl`	Boolean which enables or disables the trade channels

Example `<trades-enabled> no </trades-enabled>`

6.44.3 config.gmac.markets.market.preferred-channel

Description XETRA specifies the preferred multicast to use for each product via the gateway location id in XETRA Instrument Reference messages.

GMAC will use the preferred multicast, or this setting allows the user to override the XETRA recommendation.

Usage `<preferred-channel> prefChan </preferred-channel>`

Parameters

`prefChan`	0 or A	Use channel A
	1 or B	Use channel B
	G	Use the channel that the exchange recommends (default)
	P	Use the opposite channel that the exchange recommends

Example `<preferred-channel> G </preferred-channel>`

6.44.4 config.gmac.markets.market.preferred-interface

Description Allows users to specify the physical interfaces to use for the A and B channels.

The first interface given is used for the A channels, and the second is used for the B channels.

If this setting is not used, the same interface will be used for the A and B channels i.e. the interface specified for the reference channel.

The plugin to use for the A and B channels is still taken from the setting used

for the reference channel. It is therefore not possible to use different plugins for the A and B channels.

Note:

> Using an invalid interface will generate an error.

Usage `<preferred-interface> interface_A interface_B </preferred-interface>`

Parameters

`Interface_A`	First interface used for the A channels
`Interface_B`	Second interface used for the B channels

Example `<preferred-interface> ac0 ac1 </preferred-interface>`

6.44.5 config.gmac.markets.market.channel-definition-file

Description Selects the preferred instrument groups.

GMAC will select all the instrument groups when the file is empty or this configuration is missing. The list of all XETRA reference groups is displayed by GMAC after the reference information is received when market verbosity is 2; the file must be empty. The user can then adjust his definition file. The groups are white-space separated.

Note #1:

> The maintenance channel is in group MAINTENANCE.

Note #2:

> The instrument group name is the InstGrp - Instrument Group Type field in Xetra EnBS documentation R12.0.

Usage `<channel-definition-file> FileName </channel-definition-file>`

Parameters

`FileName`	Channel definition file

Example `<channel-definition-file> ../xetra_channel_definition </channel-definition-file>`

6.44.6 config.gmac.markets.market.extension-messages

Description Enables the generation of extension messages, by default these are disabled.

Usage `<extension-messages> extMsgs </extension-messages>`

Parameters

`extMsgs`	Boolean which enables/disables setting

Example `<extension-messages> on </extension-messages>`

6.44.7 config.gmac.markets.market.symbol-ref-file

Description Location of the symbol reference file, which may be generated by GMAC from the symbol reference information received on the live reference channel (see notes on write-symbol-ref-file option, below). If this option is used, GMAC will read the reference data from the file specified instead of

reading it from the live reference channel, making it possible to perform quick mid-day starts, and will open the appropriate channels immediately.

Note #1:

> Usual time to receive complete reference data for simulation environment is less than 10 seconds, not counting the time needed for IGMP to get the data.

Note #2:

> If the file is malformed or incomplete, GMAC will issue a configuration error and quit.
>
> This option cannot be used simultaneously with write-symbol-ref-file (see below). Attempt to do so will result in a GMAC configuration error.

Usage `<symbol-ref-file> symbFile </symbol-ref-file>`

Parameters `symbFile` Location of the symbol reference file

Example
```
<symbol-ref-file> xetra_reference </symbol-ref-file>
```

6.44.8 config.gmac.markets.market.write-symbol-ref-file

Description Symbol reference file destination. If this is specified, GMAC attempts to write the symbol reference file when the symbol reference information is received from the live reference channel. One complete cycle will be processed and written, unless the process is terminated prematurely or the feed is interrupted. Any existing reference file with the same file name is overwritten.

Note:

> This option cannot be used simultaneously with symbol-ref-file (see above). Attempt to do so will result in a GMAC configuration error.

Usage `<write-symbol-ref-file> symbFile </ write-symbol-ref-file>`

Parameters `symbFile` Symbol reference file destination

Example
```
<write-symbol-ref-file> xetra_reference </ write-symbol-ref-file>
```

7. Configuring Multiple Markets

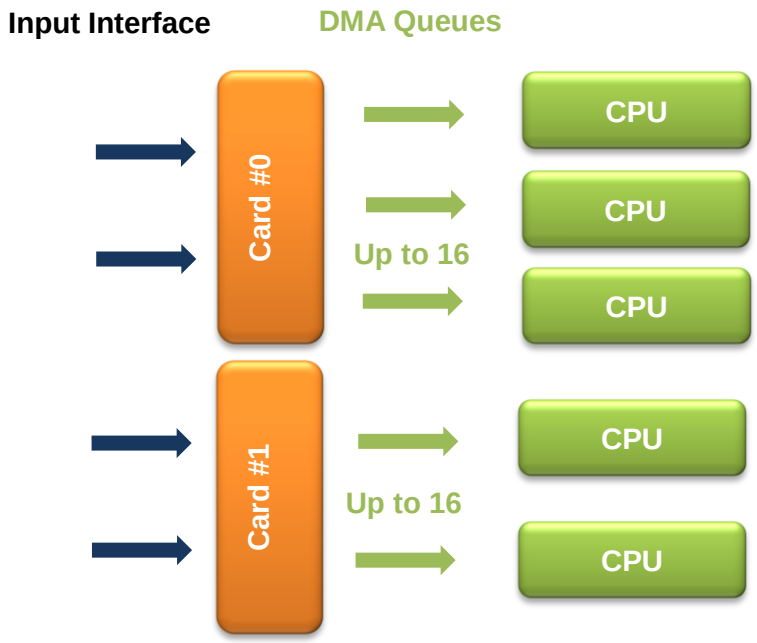
When configuring multiple markets, recovery is enabled per channel. That is, if enabling recovery, then all markets directed to a channel must have recovery configured.

8. Configuring Multiple Queues

Using multiple queues allows the user to scale the load efficiently to multiple processor cores. The Celoxica accelerator card can spread the data flow based on simple filtering rules.

Both 1G and 10G cards support up to 16 DMA (or GMAC) queues. Multiple cards can be used to make use of more queues and thus more CPUs.

The following figure illustrates a multi-queue solution:



There is no correspondence between queues and the physical input interfaces (ac0, ac1). It is therefore possible to route data from either interface to any queue. However, it is not possible to route the same traffic from one interface to multiple queues simultaneously. It is also not possible to route data from one card to a queue on another card.

8.1 GMAC

The user application will be written to spawn multiple threads and open multiple DMA queues as necessary. It is also possible to run multiple applications on the same machine as long as the following rules are obeyed:

- Each application uses a unique configuration file: the configuration file specifies the routing of multicasts to DMA queues.
- Multiple applications can't share the same queue.
- The total number of queues used by all applications using the same card doesn't exceed 16.
- Multiple applications don't subscribe to the same multicast on a single interface.
- Any one application doesn’t subscribe to the same multicast on the same interface but on multiple queues.

Note that queue arbitration is handled by the Celoxica driver. The queue number in the configuration file is therefore not the actual queue DMA queue used on the card. Hence, queue numbers can be reused between configuration files for multiple applications.

8.2 Order Book

The Order Book configuration file should specify the number of DMA queue reading threads (Book threads) to be spawned.

The GMAC part of the configuration must follow the same rules as for GMAC-only set-ups as concerns the mapping of multicasts to DMA queues. Additionally, all multicasts on a given market should be routed to the same queue in OB configurations.

Note:

This is a requirement for the Celoxica Order Book application; it is not required for the GMAC.

9. Examples

9.1 Multiple Queues

The following example shows configuration where ITCH is routed to DMA queue 0 and ARCA is routed to queue 1. The queue setting appears in **bold**.

```
<markets>
      <market> 0 ITCH40
            <channels>
                  <channel> 0 0 lldt ac0 233.54.12.219:26477 </channel>
            </channels>
            <start-seq> undefined </start-seq>
            <recovery>
                  <host> 206.200.246.219 </host>
                  <port> 36987 </port>
            </recovery>
      </market>
      <market> 1 ARCA
            <symbol-ref-file> ../ArcaSymIdx.20100902 </symbol-ref-file>
            <channels>
                  <channel> 0 1 lldt ac0 224.1.2.133:13014  </channel>
                  <channel> 1 1 lldt ac0 224.1.2.133:13015  </channel>
                  <channel> 2 1 lldt ac0 224.1.2.133:13016  </channel>
                  <channel> 3 1 lldt ac0 224.1.2.133:13017  </channel>
                  <channel> 4 1 lldt ac0 224.1.2.224:17001  </channel>
            </channels>
            <start-seq> undefined </start-seq>
      </market>
</markets>
```

The Order Book configuration file also has to specify:

```
<max-queues> 2 </max-queues>
```

For more information on configuring the Order Book, see the Order Book configuration guide.

9.2 Single Market

The following example shows configuration for CME.

```
<config>
      <gmac>
            <!-- verbosity -->
            <verbosity> 2 </verbosity>
            <ade-verbosity> 1 </ade-verbosity>

            <!-- reorder/recovery buffer pool -->
            <bufferpool> 1048576 4 </bufferpool>

            <!-- recovery settings -->
            <recovery> off </recovery>
            <recovery-logfile> recovery.log </recovery-logfile>
            <recovery-log-socket> on </recovery-log-socket>
            <recovery-affinity> 15 </recovery-affinity>

            <!-- specifies if GMAC should send subscription IGMP packets -->
            <subscription> on </subscription>

            <!-- globally enables the hardware FAST decoding -->
            <fast-decoding> on </fast-decoding>

            <markets>
                  <!-- market ID = Market name -->
                  <market> 0 CME2
                        <v3> on </v3>
                        <time-zone> -6 </time-zone>

                        <!-- enables the hardware FAST decoding -->
                        <fast-decoding> on </fast-decoding>

                        <!-- refer to ftp://ftp.cmegroup.com/fix/Production/Configuration/config.xml for market data configuration
details -->
                        <!-- for clarity and ease of identification, list the incremental live first and then instrument -->
                        <channels>
                              <channel> 0 0 lldt ac0 224.0.26.3:10003  - - - on </channel> <!-- 9IA incremental -->
```

```
                        <channel> 1 0 lldt ac0 224.0.26.13:10020 - - - on </channel> <!-- 115IA incremental -->
                        <channel> 2 0 lldt ac0 224.0.26.1:10001  - - - on </channel> <!-- 7IA incremental -->
                        <channel> 3 0 lldt ac0 224.0.26.39:12003 - - - on spin </channel> <!-- 9NA instrument replay -->
                        <channel> 4 0 lldt ac0 224.0.26.49:12020 - - - on spin </channel> <!-- 115NA instrument replay -->
                        <channel> 5 0 lldt ac0 224.0.26.37:12001 - - - on spin </channel> <!-- 7NA instrument replay -->
                  </channels>

                  <!-- associates snapshot refresh channels with their incremental live counterpart -->
                  <snapshot-enabled> yes </snapshot-enabled>
                  <snapshots>
                        <channel> 0 0 lldt ac0 224.0.26.21:11003 - - - on </channel> <!-- 9SA snapshots -->
                        <channel> 1 0 lldt ac0 224.0.26.31:11020 - - - on </channel> <!-- 115SA snapshots -->
                        <channel> 2 0 lldt ac0 224.0.26.19:11001 - - - on </channel> <!-- 7SA snapshots -->
                  </snapshots>
            </market>
      </markets>
</gmac>
</config>
```