Dialogic® DSI Signaling Software Release Notes M3UA for Solaris

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Contents

M3UA for Solaris - V6.02 2

M3UA for Solaris - V6.01 4

M3UA for Solaris - V6.00 6

M3UA for Solaris - V6.02

1 Overview

This release adds optional heartbeat functionality to M3UA.
This release is backwards compatible with the previous release

1.1 Applicability

Users may update to this version if they require the M3UA to transmit heartbeats – the module acknowledges received heartbeats as it did before.

2 New Functionality

2.1 M3UA Heartbeat Functionality

M3UA now supports the ability to turn on heartbeats at the M3UA level – this is generally unnecessary since the underlying SCTP protocol has a heartbeat mechanism.

The heartbeat option is enabled by setting bit 6 (M3UOP_ASSOC_BEAT_TX) in the options field of the M3U_MSG_CNF_ASSOC (0x72c1) message.

The default heartbeat interval T(beat) is 30 seconds, but may be specified by a new parameter. This parameter together with other related changes is detailed below.

2.1.1 M3UA Timer Configuration Message

The M3U_MSG_CNF_TIMERS (0x72fc) message has been extended to include a heartbeat interval T(beat), to enable a different interval to be set.

Offset	Size	Name
6	2	Heartbeat – T(beat)

Default values and permitted ranges are shown below. Specifying 0 for a parameter value will set that timer back to its default value.

Timer Name	Default Value	Max Value	Min Value
Heartbeat / s	30	1,200	1

2.1.2 M3UA Event Indication

An additional event type (M3Uv_HEARTBEAT_FAILURE) has been added to the M3U_MSG_M3U_EVENT (0x02ee) message to indicate to the management module when a heartbeat failure occurs.

Event type	Value	Description
M3Uv_PROTOCOL	0	An M3UA protocol violation has occurred.
M3Uv_M3UA_ERROR	1	Reception of M3UA ERROR message from the M3UA Peer
M3Uv_HEARTBEAT_FAILURE	2	M3UA Heartbeats have failed

2.1.3 Association Statistics Message

The M3U_MSG_R_ASSOC_STATS (0x62d0) has been increased to include a 'beat_failure' counter, which counts the number of M3UA heartbeat failures on a per association basis.

Offset	Size	Name
156	4	beat_failure

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M3UA for Solaris - V6.01

1 Overview

This release adds Default Routing functionality to M3UA allowing messages to be routed to Signaling Points for which Routes have not been explicitly configured. It removes a limit on the number of Routes which can be configured via any one Signaling Gateway and also corrects an issue concerning generation of DAUD (Destination Audit) messages.

This release is backwards compatible with the previous release.

1.1 Applicability

All users are advised to migrate to this new version of M3UA. Existing users who have deployed systems using the MBM utility should refer to the release notes for V6.00 for details of how to remove the MBM utility as it is no longer required.

2 New Functionality

2.1 Default Routing

M3UA now supports the ability to Route messages for which no explicit Route has been configured. When a message is passed to M3UA for Routing to the network M3UA searches it's Routing Table for a Route matching the DPC in the message for transmission. If no match is found then an optionally configured Default Route may be used for Routing.

A Route may be designated as a default Route by setting bit 2 (M3UOP_ROUTE_DEFAULT) in the 'options' field of the M3U_MSG_CNF_ROUTE (0x72c3) message. Only one Default Route may be configured. The Default Route availability follows the same rules as other Routes.

If the option M3UOP_ROUTE_ASSUME_AVAIL is set then the Default Route will become available as soon as the network connections become available. In this case the DPC in the Route serves little purpose (though must still be unique in the Routing Table). A DPC of Zero could be used.

If the option M3UOP_ROUTE_ASSUME_AVAIL is not set then the Default Route will only become available when the DPC used in the configuration message becomes available. The Point Code of the Signaling Gateway through which the Route connects to the network may be used.

3 Other Changes

3.1 Limit to number of Routes Configurable

A limitation existed to the number of Routes which could be configured to any one Signaling Gateway. This prohibited the maximum number of Routes supported by M3UA being used for configurations connecting to the network via a single Signaling Gateway.

Now all Routes can be configured via a single Signaling Gateway.

3.2 Destination Audit Generation (DAUD)

M3UA generates DAUD messages to synchronize it's own Route Table with the Signaling Gateways it uses. DAUD messages should be generated once the connection to the Signaling Gateway is ACTIVE. Previously DAUD messages were being generated when the connection was UP but still INACTIVE. This could lead to the Signaling Gateway rejecting the DAUD messages and the generation of error messages.

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M3UA for Solaris - V6.00

1 Overview

This is a major release of the m3ua module.

This release provides more flexible and easier to use Layer Management control over system restart and the ongoing network activation state. This makes it easier to develop new applications, and supports more sophisticated resilience models. Some of these resilience models require the use of the new Development Package component RMM and updated S7_MGT module.

This release of M3UA is accompanied by a major update of the M3UA Programmer's Manual (Issue 4) adding clarification to the message based configuration interface and extending the management interface supporting users wishing to directly configure and control M3UA.

This release is also accompanied by a major update to the SIGTRAN Host Programmer's manual (Issue 7) for users configuring the system using config.txt configuration files. This deprecates the use the MBM module which had previously assisted in the activation of M3UA hosts. Functionality present in MBM has now been integrated into M3UA while maintaining backwards compatibility.

Other changes in this release include new functionally and enhancements in the areas of alarms, statistics and timer configuration.

This release also improves the robustness of the M3UA ASP and AS state machines. A number of race conditions in these state machines have been removed which could lead to start-up and conformance issues.

This release is largely backwards compatible with the previous release although users no longer need to run the MBM utility. In addition the use of trial mode is now limited to one hour. See sections 3.1 and 3.3 for further details.

1.1 Applicability

All users are advised to migrate to this new version of M3UA. Existing users who have deployed systems using the MBM utility should refer to section 3.1 below for details of how to remove the MBM utility as it is no longer required.

2 New Functionality

2.1 Data Throughput Rate Alarm

The existing M3UA management indications used for monitoring the systems licensed data throughput have been extended. The system now supports a user configurable throughput threshold, expressed as a percentage of the licensed throughput and defaulting to 80%. When this throughput limit is exceeded a management indication is sent to the configured management module. When the throughput falls back below an abatement threshold (default 40%) an abatement indication is generated.

The existing License event indication message ‘MGT_MSG_LIC_EVENT (0x0f23)’ has been extended to report these new throughput alarm event indications. The new event type and event indication codes used are shown below.

Event Type Mnemonic	Value
LICEVENT_TYPE_THROUGHPUT_ALARM	4

Event Indication Mnemonic	Value
LICEVENT_THROUGHPUT_ALARM_INACTIVE	0
LICEVENT_THROUGHPUT_ALARM_ACTIVE	1

The existing throughput statistics message ‘MGT_MSG_R_THR_STATS (0x6f21)’ has been extended to report the number of times the throughput alarm has fired and the duration for which the throughout has exceeded the alarm threshold. These are returned in the alarm_count and alarm_duration parameters.

The existing License Status message ‘MGT_MSG_R_LIC_STATUS (0x6f22)‘ has been extended to indicate whether the throughput alarm is currently active. If the ‘Throughput Alarm State’ is set to one then the throughput alarm is currently active. It will be set to zero if not active.

The throughput alarm onset and abatement thresholds can be set to user defined values using the new message ‘MGT_MSG_SET_THR_ALARM (0x5f27)’. This message can also be used to disable the alarm by setting the onset and abate thresholds to zero.

The Onset threshold defines the level at which the throughput alarm should fire expressed as a percentage of the licensed throughput.

The Abate threshold defines the level at which the throughput alarm should abate expressed as a percentage of the licensed throughput. This must be less than the onset threshold.

The full message definition for all messages is contained within the M3UA programmer’s Manual.

2.2 M3UA Automatic Activation

Previously the activation and reactivation of ASPs and ASs was a manual process performed by layer management (or MBM on a S7_MGT / config.txt system). This required construction of an activation state machine to ensure proper initialization and recovery from all possible failure scenarios. This release sees the addition of automatic AS and ASP activation to M3UA itself without the need for the use of MBM or for the user to implement an activation state machine. This functionality is enabled by setting the new 'Auto Activate' options in the M3U_MSG_ASP_UP_REQ and M3U_MSG_ASP_ACT_REQ messages. When these options are enabled M3UA will try and maintain the ASP and AS in an UP or ACTIVE state respectively.

The reception of an M3U_MSG_ASP_DOWN_REQ or M3U_MSG_ASP_INACT_REQ will result in the ‘Auto Activate’ option being cleared. The M3U_MSG_ASP_UP_REQ, M3U_MSG_ASP_ACT_REQ, M3U_MSG_ASP_DOWN_REQ and M3U_MSG_ASP_INACT_REQ messages are defined in the M3UA Programmer’s Manual.

M3UA also supports a new message M3U_MSG_ACTIVATE which can be used to activate the association, bring the ASP up and activate the AS across the association with just a single message. This message also causes the 'Auto Activate' options to be set for the ASP and AS. The corresponding M3U_MSG_DEACTIVATE clears the 'Auto Activate' flags and deactivates the association forcing the ASP and AS to be down and inactive. These messages are defined in the M3UA Programmer's Manual.

Note: The M3U_MSG_ACTIVATE and M3U_MSG_DEACTIVATE messages were previously supported by the deprecated MBM module and called MBM_MSG_ACTIVATE and MBM_MSG_DEACTIVATE respectively. S7_MGT automatically generates M3U_MSG_ACTIVATE for all associations after successfully configuring the system.

2.3 M3UA Peer Acknowledgement Time Out

A new timer T(ack) has been introduced to the ASP and AS state machines which is started when a response is expected from the peer. Should the timer expire without a response being received then M3UA will give a negative confirmation to Layer Management or, if the 'Auto Activate' option is set will retransmit the request to the peer. The negative confirmation uses the same message type as is used for a positive confirmation but with the status field set to a non-zero value.

The default value for T(ack) is two seconds. This can be changed using the new timer configuration message M3U_MSG_CNF_TIMERS described later.

2.4 M3UA Peer Activation Request Blocking

Previously M3UA would never refuse a peer request to ACTIVATE or bring UP an AS or ASP. If the peer sent an M3UA UP or ACTIVATE request then it would automatically be accepted. In this release M3UA supports an option to reject peer requests. This is enabled by sending an M3U_MSG_ASP_DOWN_REQ or M3U_MSG_ASP_INACT_REQ with the 'Auto Deactivate' option set. This option is cleared by sending a subsequent message without this option set or by sending any UP or Activate request.

2.5 M3UA Timer Configuration Message

M3UA supports a number of timers which take default values as suggested by the M3UA RFCs or otherwise. A new timer configuration message M3U_MSG_CNF_TIMERS (0x72fc) defined in the M3UA programmer's Manual is available to change these timer values if required.

2.6 M3UA AS Pending State Buffering

When a redundant remote application operating in an Active Standby mode experiences a fault causing the Active system to fail M3UA will enter a Pending state. While in this state M3UA will buffer messages for the application while waiting for the standby unit to Activate. If the T(recovery) timer expires before the standby unit has activated then the buffered messages will be discarded and the AS will move from Pending to Inactive.

Previously, when in the Pending state, M3UA would only allow up to Ten messages to be buffered after which messages would be discarded. Now M3UA will continue to buffer messages until the system enters GCT congestion. If the system enters GCT congestion then the message buffer will be flushed. If the peer recovers buffered messages will be retransmitted over a short period of time so as to not overload the system.

2.7 Statistics Messages Time Period

The per Association, server and route statistics messages have all been extended to support a period field and to allow the internal statistics counters to be reset to zero. The parameter 'period' has been added to the definitions of M3U_MSG_R_ASSOC_STATS, M3U_MSG_R_SERVER_STATS and M3U_MSG_R_ROUTE_STATS in the M3UA Programmer's Manual.

2.8 Support for MTP L4 Update

This message is sent to the MTP3 module to request that all user parts are notified of the current route status for the given destination using the normal MTP-PAUSE, MTP-RESUME and MTP-STATUS primitives.

3 Other Changes

3.1 Deprecation of MBM

The MBM module has been closely integrated to the configuration and management of M3UA systems. This offered the benefit of making systems configured with S7_MGT / config.txt simple to setup and control but had the disadvantage of prohibiting more sophisticated systems. This release integrates the functionality offered by the MBM module with M3UA removing the need for a second module and providing a single point of configuration and control. This has been achieved in a manner which retains backwards compatibility with existing systems.

New systems should not use MBM. Existing deployments need to be changed slightly to no longer use MBM. The following changes are required to the system.txt file to migrate from the use of mbm.

Add a 'Redirect' command from MBM's module id to M3UA's module ID.

```
REDIRECT 0xc2 0xd2
```

Remove the 'Fork process' command for MBM

```
FORK_PROCESS ../mbm
```

For backwards compatibility S7_MGT will continue to generate MBM configuration messages which will now be forwarded to M3UA. M3UA will respond to these messages with a positive acknowledgement. New functionality in M3UA will handle the MBM_MSG_ACTIVATE and DEACTIVATE messages as previously discussed.

3.2 Traffic Mode in AS Active Indications

The AS Active Indication message 'M3U_MSG_AS_ACT_IND (0x02e0)' is generated when a Server becomes active. It contains a parameter indicating the traffic mode which it has become active in. Previously this was the local traffic mode which had been requested when the AS was activated, now it is the peer traffic mode as requested at activation time or via prior configuration.

3.3 Trial Mode

When operating in trial mode (using the –t command line option), the period of operation is now restricted to one hour after which the binary will terminate.

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