Binary for Solaris - M3UA

Release Notes for Version 3.00

1. Overview

This is the first release since V2.02 and is for use with the SS7 Development Package for Solaris V3.00 or later. It cannot be used with earlier development packages.

Customers wishing to make use of the Long Message support offered in V3.00 of the development package should upgrade to this release of software (Long Message support is required for SCCP Segmentation). Other customers need not upgrade.

In addition, this release resolves a number of issues when M3UA operates (1) as part of an ASP, whether these features manifest or not is dependant on the Signalling Gateway that is connected to and if evident may lead to total lack of service and (2) as part of a Signalling Gateway Process (SGP), which occurs when the SGP connects to an Application Server Process (ASP) running two or more Application Servers (AS).

2. New functionality

2.1 Use of Solaris shared object

This release makes use of shared object version of the GCT library included in V3.00 of the development package. The module does not use Long Messages itself but it does permit the module to be used in an environment where Long Messages are being used.

3. Changes

3.1 ASP Activate Ack Optional Parameters

If an ASP Activate Acknowledge message is received without the optional Traffic Mode parameter then previously M3UA would silently discard the message and not mark the AS as ACTIVE. This has been resolved in this release.

3.2 SSNM received with RC parameter caused module failure

If an SSNM message, (DUNA, DAVA or DRST) was received from the Network with the optional Routing Context parameter this caused the M3UA module to crash. This has been resolved in this release.

3.3 Routing Context absent SSNM Messages

SS7 Signalling Network Management (SSNM) Messages generated from an SGP to an ASP must include the Routing Context parameter if multiple ASs are configured on the ASP.

Previous versions of M3UA did not comply with this resulting in SSNM messages being rejected on the ASP. This prevents M3UA Routes on the ASP being updated.

Dialogic
31-May-06

Binary for Solaris – M3UA

Release Notes for Version 4.02

1. Introduction

This release is the first to support IPSP connections between peer to peer ASP (host) M3UA systems and for generation of DAUD messages from ASPs to SGs. IPSP connections allow transport of SS7 signalling across all IP networks without need for MTP Signalling Links. This allows for investment in IP networks while maintaining existing proven SS7 technology.

This release also adds support for three new licenses supporting different combinations of associations and throughput allowances. This allows the customer to better match the needs of the protocol license used to the scale of the system. In addition, to aid customers in using the new licenses, the module supports Throughput Monitoring functionality.

This release has moved the definition of “M3UA_TASK_ID” from the “m3ua_inc.h” file to the “ss7_inc.h” file. New versions of both of these header files are available with this release.

This release is the first generally available release since V3.00 and is backwards compatible with that release.

2. New Functionality

2.1 IPSP Connections (Peer to Peer ASP operation)

Connections directly between ASPs are now supported allowing systems to communicate without the use of Signalling Gateways. These connections may be configured using the existing interface. This release of M3UA supports connection to a different remote ASP for each SCTP association used. Each remote ASP can support a different AS or an AS can be distributed over a number of associations.

The following information is necessary for configuring the M3UA host binary for IPSP operation:

- The DPC of the remote system.
- The M3UA Routing Context of the remote system.
- The logical id’s of the SCTP associations connecting to the remote system.

For further information refer to the SIGTRAN Host Programmer's manual.

Routing between ASPs is based on DPC only.

2.2 New Licenses

Three new licenses SS7SBHSTM3UAS, SS7SBHSTM3UAR and SS7SBHSTM3UAL are now supported. These enable both IPSP and ASP operation. The existing SS7SBHSTM3UA license supports ASP operation only. The new licenses support a range of associations and throughput limits.

Licence	**Assoc**	**Throughput**		**IPSP or ASP operation**
		TDM Link Equivalents	**(Kbps)**	
SS7SBHSTM3UAU	4	4	312	ASP and IPSP
SS7SBHSTM3UAS	16	16	1232	ASP and IPSP
SS7SBHSTM3UAR	32	32	2464	ASP and IPSP
SS7SBHSTM3UAL	64	64	4920	ASP and IPSP
SS7SBHSTM3UA (Existing)	*32*	n/a	*n/a*	ASP only

2.3 Capability Licensing

This release introduces a new licensing scheme to allow use of the M3UA module for different size systems. Different licences have been made available to support up to a certain number of SCTP associations and a specified traffic throughput.

Throughput is calculated using the payload content of the API_MSG_TX_REQ message (sent towards the network) and the payload content (ie. PROTOCOL_Data – 4 octets) of the SCTP_MSG_RX_IND message (received from the network).

For licensing purposes the sum of the TX and RX direction will be used. Other parameters or messages not listed above will not count towards the totals. For management and monitoring purposes individual sums of TX and RX will be maintained.

To support management of these new capabilities, new messages have been added as detailed in this section.

2.3.1 Configure M3UA Module

Synopsis:

Sent to the M3UA module to configure global parameters. When using s7_mgt this message will be sent automatically.

Message Format:

MESSAGE HEADER	
FIELD NAME	**MEANING**
type	**M3U_MSG_CONFIG** (0x72c0)
id	0
src	Management Entity
dst	M3U Module
rsp_req	Used to request a confirmation
hclass	0
status	Non zero on error
err_info	0
len	15

PARAMETER AREA		
OFFSET	**SIZE**	**NAME**
0	1	mn_mod_id
1	1	trace_mod_id
2	1	maint_mod_id
3	2	max_assocs
5	2	max_servers
7	2	max_routes
9	2	max_throughput
11	4	options

Description:

This message must be the first message sent to the module to configure the module wide settings.

Parameters

mn_mod_id

Module ID for the Management Module.

trace_mod_id

Module ID for the Trace Module.

maint_mod_id

Module ID for the Maintenance Module.

max_assocs

Maximum number of Associations the module will be required to handle.

max_servers

Maximum number of Servers the module will be required to handle.

max_routes

Maximum number of Routes the module will be required to handle.

max_throughput

Maximum throughput required from the module in kB/s.

Functionality options

This is a bit map specifying functionality that will be required by the module.

Bit	Functionality	Mnemonic
0	IPSP configurations	M3UA_FUNC_OPT_IPSP

Note: For backwards compatibility if the old module configuration is submitted then the throughput will default to the maximum licensed. If IPSP is licensed then it will be permitted.

2.4.2 Request Licensing State

Synopsis:

Sent by Layer Management to request the current license state.

Message Format:

MESSAGE HEADER	
FIELD NAME	**MEANING**
type	**MGT_MSG_R_LIC_STATUS** (0x6f22)
id	0
src	Layer Management
dst	M3U Module
rsp_req	Set appropriate response required bit
hclass	0
status	Set to 1 if module not enforcing licensing
err_info	0
len	56

PARAMETER AREA		
OFFSET	**SIZE**	**NAME**
0	4	Version
4	4	Licensed Protocol
8	4	Licensed Throughput Rate
12	4	Licensed Links
16	4	Licensed Sessions
20	4	Licensed Options
24	4	Configured Throughput Rate
28	4	Configured Maximum Links
32	4	Configured Maximum Sessions
36	4	Configured Options
40	4	Current Throughput Credit
44	4	Current Active Links
48	4	Current Active Sessions
52	4	Cong State

Parameters

The version and Licensed protocol parameters should be set by the user. The rest of the parameters are set but the module in the reply.

Version

Set to 0.

Licensed Protocol

Identifies the protocol being licensed. For M3UA set to 0.

Licensed Throughput

The throughput permitted by the installed license or licenses.

Licensed Links

The number of links or associations permitted by the installed license or licenses

Licensed Sessions

The number of simultaneous sessions or dialogs permitted by the installed license or licenses. Note: Not used by M3UA.

Licensed Options

Bit mask of M3UA specific functionality enabled by current licenses. See the '**Functionality options'** parameter of the M3UA_CONFIG message for definitions of individual bits.

Configured Throughput

The maximum throughput requested in the M3UA_CONFIG message.

Configured Maximum Links

The maximum number of links permitted as requested in the M3UA_CONFIG message.

Configured Maximum Sessions

The maximum number of concurrent sessions permitted as requested in the M3UA_CONFIG message. Note: Not used by M3UA.

Configured Options

Bit mask of M3UA specific functionality enabled by current licenses. See the '**Functionality options'** parameter of the M3UA_CONFIG message for definitions of individual bits.

Current Throughput Credit

The number of bytes that can be sent to or received from the network by M3UA before enforcement mechanisms are triggered.

Current Active Links

Number of links or associations currently configured.

Current Active Sessions

Number of circuits or dialogs currently in use. Not used by M3UA.

Throughput Congestion State

Value	State	Description
0	UNCONG	No throughput congestion indicatations have been raised or congestion has abated
1	CONG	Throughput congestion indications have been raised but congestion abatement has not yet occurred

2.4.3 License Event Indication

Synopsis:

Sent to Layer Management to indicate a license related event. In the case of throughput it indicates throughput congestion onset, abatement or the beginning of enforcement.

Message Format:

MESSAGE HEADER	
FIELD NAME	**MEANING**
type	**MGT_MSG_LIC_EVENT** (0x0f23)
id	0
src	Layer Management
dst	M3U Module
rsp_req	0
hclass	0
status	0
err_info	0
len	8

PARAMETER AREA		
OFFSET	**SIZE**	**NAME**
0	4	Protocol Type
4	2	Event Type
6	2	Event Indication

Parameters

Event Type

Event type	
0	Undefined
1	Throughput
2	Link/Associations
3	Session/Dialog

Event Indications

Throughput Event Indications

Throughput Event indication	
0	ABATE
1	CONGESTION
2	ENFORCEMENT

Link/Associations

None currently defined

Session/Dialog

None currently defined

2.5 Throughput Monitoring

In order to enable monitoring of the system throughput the M3UA module has been extended to offer additional statistics including:

- Data Received from the Network (RX Data)
- Data Received from the user module to be sent to the network (TX Data)
- Combined Rate
- Peak Rates (RX Data/TX Data and Combined)
- Enforcement state and congestion counts

These can be determined using the message MGT_MSG_R_THR_STATS (0x6f21) shown below.

2.5.1 Request Throughput Statistics

Synopsis:

Sent by Layer Management to request the current throughput statistics.

Message Format:

MESSAGE HEADER	
FIELD NAME	**MEANING**
type	**MGT_MSG_R_THR_STATS** (0x6f21)
id	0
src	Layer Management
dst	M3U Module
rsp_req	Set appropriate response required bit
hclass	0
status	Non zero to Reset
err_info	0
len	36

PARAMETER AREA		
OFFSET	**SIZE**	**NAME**
0	4	Version – Must be set to zero
4	4	Protocol
8	4	Time Period
12	4	RX Data
16	4	TX Data
20	4	RX_rate_peak
24	4	Tx rate_peak
28	4	Rate_peak
32	2	Congestion Count
34	2	Enforcement Count

Parameters

The version and Licensed protocol parameters should be set by the user. The rest of the parameters are set by the module in the reply.

Licensed Protocol

Identifies the protocol being licensed. For M3UA set to 0.

Time Period

Updated by the module to show the time since start-up or the last statistics reset. Units of 100ms.

RX Data

Amount of counted data, measured in Kbytes, received by the module from the network since the last statistics reset.

TX Data

Amount of counted data, measured in Kbytes, sent by the User module since the last statistics reset.

RX rate peak

The peak Rx data rate averaged over a rolling thirty second time window. Units of Bytes / Second.

TX rate peak

The peak Tx data rate averaged over a rolling thirty second time window. Units of Bytes / Second.

Rate peak

The peak data rate for both Tx and Rx data averaged over a rolling thirty second time window. Units of Bytes / Second.

Congestion Count

Number of times the congestion state has been entered since the last statistics reset.

Enforcement Count

Number of times the congestion state has been entered since the last statistics reset.

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Release Notes for Version 4.03

1. Overview

This release adds support for multiple streams within an association (to reduce the possibility of head of line blocking) and enhances the load sharing functionality. In addition, this release corrects the reception of a DAUD message on a Signaling Gateway and now reports the temporary loss of a route as described below.

It is fully backwards compatible with the previous release.

2. Changes

2.1 DAUD reception on a Signaling Gateway

The M3U_MSG_AUDIT_DEST_IND (0x02f3, Destination Audit Indication) message is used between M3UA and the NIF to indicate reception of a DAUD message from a peer. The NIF requires that the association id on which the DAUD message was received is included while M3UA was providing the server id.

In previous releases, this may have lead to a failure to respond to a DAUD if the server id was different to the association id. The association id is now included in the header of the M3UA message.

2.2 DAUD failure on short losses of association

In previous releases, if an association was failing and recovering quickly such that an adjacent Signaling Gateway had been unavailable for less than a second, the DAUD mechanism could fail when the route became unavailable. In such conditions, this may have prevented unavailable routes from returning to service consequently requiring the system to be restarted. This is now resolved.

2.3 Traffic load-sharing for ASP operation

The previous M3UA releases used the lowest bit of the SLS value to determine which Signaling Gateway to route traffic to. This causes traffic to each SG in a pair to be sent traffic with either all odd or even SLS values making onward routing more difficult.

This release uses the highest bit of the SLS instead, improving the traffic load-sharing.

2.4 Support for multiple data streams

The previous M3UA releases used only stream 1 for data traffic and stream 0 for management traffic.

This release now load-share traffic across multiple streams in the association for data traffic. The use of multiple streams can aid the performance of an association in systems experiencing high latency and message loss.

The data traffic is load-shared across the streams based on the SLS values. The streams used are those negotiated with the far end of the association. For example, if an association starts up with 9 streams then stream 0 is still reserved for management traffic but data traffic is distributed across streams 1 to 8.

Dialogic
04-Mar-08

Binary for Solaris – M3UA

Release Notes for Version 4.04

1. Overview

The release includes minor changes and corrections as detailed below. It is fully backwards compatible with the previous release.

2. Changes

2.1 Error value in M3U_MSG_M3U_ERROR message

The previous M3UA releases used the same error value for “err_val1” and “err_val2” in message M3U_MSG_M3U_ERROR (0x02ef). M3UA now uses two distinct values for parameters “err_val1” and “err_val2” as defined in the M3UA Programmer’s Manual.

2.2 Status Information in Notify message

The previous release only accepted values “1” (Insufficient ASP Resources Active in AS) and “2” (Alternate ASP Active) for the Status Information parameter contained in a NOTIFY Management message having a Status Type of “Other” (2). It now also accepts value “3” (ASP Failure).

2.3 “M3Ue_xxx” and “M3Uv_xxx” definitions in m3u_inc.h

Type definitions “M3Ue_xxx” and “M3Uv_xxx” respectively used in M3U_MSG_M3U_ERROR (0x02ef) and M3U_MSG_M3U_EVENT (0x02ee) messages are now available in the external include file “m3u_inc.h“ and are listed here for reference.

Error types for M3U_MSG_M3U_ERROR

Mnemonic	Value
M3Ue_BAD_STATE	0
M3Ue_CONFIG	1
M3Ue_RESOURCE	2
M3Ue_TIMER_TICK	3

Error types for M3U_MSG_M3U_EVENT

Mnemonic	Value
M3Uv_PROTOCOL	0
M3Uv_M3UA_ERROR	1

Binary for Solaris – M3UA

Release Notes for Version 5.00

1. Overview

This is the first release since V4.04 and includes enhancements to the licensing mechanism to support new format tokens in license files.

In addition, this release adds support for ANSI_24 Routing Label with 8-bit SLS as well as support for SLS bit rotation. Activation of the SLS rotation feature requires use of s7_mgt V2.08 or later which is part of the Dialogic® DSI Development Package for Solaris V3.07 or later.

This release is fully backwards compatible with the previous release.

2. New Functionality

2.1 New Licenses

A range of new licenses are now offered allowing users to determine the level of throughput to be supported in any specific deployment. The full range of currently available M3UA licenses and the capability of each are detailed in the table below.

These new licenses replace the old SS7SBHSTM3UA licence which continues to support 32 associations with no throughput limiting

Dialogic Part Number	Description	Throughput	Max Associations	TDM Link Equivalents at 0.6 Erlang
G01-005-01	SS7SBHSTM3UAU	312kb/s	4	4
887-243-01	SS7SBHSTM3UAS	1,232kb/s	16	16
887-365-01	SS7SBHSTM3UAR	2,464kb/s	32	32
887-242-01	SS7SBHSTM3UAL	4,920kb/s	64	64
G15-005-01	SS7SBHSTM3UAK	9,832kb/s	128	128
G14-005-01	SS7SBHSTM3UAJ	19,664kb/s	256	256

2.2 ANSI_24 routing label with 8-bit SLS

The previous M3UA releases only supported 5-bit SLS values when using the ANSI_24 routing label. This version now also supports ANSI_24 routing label with 8-bit SLS. No specific configuration changes are required.

2.3 SLS bit rotation

SLS bit rotation is a method of load sharing in networks. It is disabled by default. It can be enabled using the rotation parameter in the new config.txt command CNNCI. This command will support the following syntax:

```
CNNCI:ss7md=<variant>[,rotation=Y];
```

for example

```
CNNCI:SS7MD=ANSI,ROTATION=Y;
```

3. Other Changes

3.1 End User Licensing

This release adds support for a later release of the licensing software and consequently supports operation using ‘dialogic’ vendor id in license fields.

This release also provides enhanced license test operation which should provide a clear indication of the licenses present. This using the existing command line option ‘-Lt’. An example of this output is shown below:

```
./m3ua_sol –Lt –Lp./LIC
./m3ua_sol: Search in directory ./LIC and current directory for valid license
./m3ua_sol: Looking for:
        license M3UA_SOL_D:     License file does not support this binary.
        license M3UA_U_SOL_D:   License file does not support this binary.
        license M3UA_SMALL_SOL_D:       License file does not support this binary.
        license M3UA_REGULAR_SOL_D:     License file does not support this binary.
        license M3UA_LARGE_SOL_D:       License file does not support this binary.
        license M3UA_K_SOL_D:   License file does not support this binary.
        license M3UA_J_SOL_D:   Success
        alternative license M3UA_SOL:   License file does not support this binary.
        alternative license M3UA_U_SOL:         License file does not support this binary.
        alternative license M3UA_SMALL_SOL:     License file does not support this binary.
        alternative license M3UA_REGULAR_SOL:   License file does not support this binary.
        alternative license M3UA_LARGE_SOL:     License file does not support this binary.
        alternative license M3UA_K_SOL:         License file does not support this binary.
        alternative license M3UA_J_SOL:         License file does not support this binary.
./m3ua_sol: *** Success - 1 valid license files found ***
```

Dialogic
22-Sep-08
Updated 21-Dec-09

Binary for Solaris – M3UA

Release Notes for Version 5.02

1. Overview

This release adds the ability to configure run-time options associated with individual Sigtran Routing Lists and adds a new option to allow destinations to be considered as Available without requiring receipt of a DAVA message from the far end. It is the first generally available release since V5.00. This release also includes additional changes to license validation. Users experiencing slow license validation are advised to upgrade to this version.

In all other respects, this release is fully backwards compatible with the previous release.

2. New functionality

2.1 New <options> parameter for SNRLI command

A new optional parameter <options> has been added to the SNRLI command within s7_mgt allowing for run-time options to be added in the future without the need to further modify the command syntax. The <options> parameter is a 32 bit field and defaults to zero if not specified.

The contents of the <options> parameter in the SNRLI command are passed at run-time by s7_mgt to the M3UA module in a new Options field (offset 2, size 4) of the M3U_MSG_ADD_ROUTE_SERV (0x72c6) message.

Note: In order to use this new field it is essential to use s7_mgt V2.09 or later.

The full syntax of the SNRLI command is as follows:

SNRLI:SNRL=,SNRT=,SG=,[OPTIONS=];

For example:

SNRLI:SNRL=1,SNRT=1,SG=1,OPTIONS=0x00000001;

2.2 Route-Server availability

This release includes functionality to allow the M3UA module to configure routes via specific servers to be considered available as soon as the Signalling Gateway is available without waiting for the reception of a DAVA.

This functionality is enabled on a per-Route/Server combination using bit 0 in the <options> field of the SNTLI command as detailed above.

When set, s7_mgt will configure M3UA to consider the route via the specified server to be available with performing a destination audit.

3. Other Changes

3.1 Slow license validation

Some users have experienced problems with slow license validation on certain platforms. Previous releases worked around this problem but required licenses to be reactivated. With this release the problem is corrected without the need to reactivate the license.

Dialogic
10-Nov-08

Binary for Solaris – M3UA

Release Notes for Version 5.03

1. Overview

This release allows the configuration of Application Servers which do not use the Optional Routing Context parameter.

This release is fully backwards compatible with the previous release.

2. Changes

2.1 Optional Routing Context Parameter

The Routing Context parameter is an optional parameter used between M3UA peers to identify which Application Server a message relates to. This parameter is only mandated by the M3UA RFC if there are multiple Application Servers the message may relate to.

Previously this parameter had been mandatory but in this release it is made optional. Furthermore whether the Routing Context should be used or not can be controlled on a per association basis using a new options field in the M3U_MSG_ADD_SERV_ASSOC message.

*Note: In typical configurations the user will not need to generate this message directly as it will be done by the S7_MGT utility. S7_MGT will set the message appropriate to the values specified in the **SNAPI** and **SNRAI** config.txt commands.*

The new message definition is shown below for diagnostic reference.

2.1.1 Add Server to an Association

Synopsis:

Declares an ASP or SGP that an AS or SG can run on.

Message Format:

MESSAGE HEADER	
FIELD NAME	**MEANING**
type	**M3U_MSG_ADD_SERV_ASSOC** (0x72c5)
id	**Association ID**
src	Layer Management
dst	M3U Module
rsp_req	Used to request a confirmation

hclass		0
status		0
err_info		0
len		10
PARAMETER AREA		
OFFSET	**SIZE**	**NAME**
0	2	srv_id
2	4	route_ctxt
6	4	options

Parameters

association ID

The logical ID of the Association used to communicate with the ASP or SGP.

srv_id

The logical ID of the AS or SG that will run on the ASP or SGP.

route_ctxt

M3UA Routing Context used by M3UA peers to identify a particular AS. If either M3UOP_SERV_ASSOC_NO_RC or M3UOP_SERV_ASSOC_FORCE_NO_RC options are set then the value used here will have no effect on the system.

Note: If no Routing Context is specified in this message then one may still be specified and used in the M3U_MSG_ASP_ACT_REQ message at run time.

options

Mnemonic	Value	Description
M3UOP_SERV_ASSOC_NO_RC	0x0001	No Routing Context is configured for use for this AS on this Association.
M3UOP_SERV_ASSOC_FORCE_NO_RC	0x0002	No Routing Context is configured for this AS on this Association and any Routing Context included in the ASP_ACT_REQ should be ignored.

Binary for Solaris – M3UA

Release Notes for Version 5.04

1. Overview

This release corrects a fault which was observed in some systems when associations were re-activated. Users who require the manual reactivating of associations are advised to upgrade to this release.

This release is fully backwards compatible with the previous release.

2. Changes

2.1 Association Reactivation

A fault was observed in some running systems when associations were activated, deactivated and then later reactivated. This fault is now corrected.

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19-Dec-08
Updated 23-Jan-09

Binary for Solaris – M3UA

Release Notes for Version 5.05

1. Overview

This is a maintenance release to add additional error checking of messages received from the user and an additional error indication should a poorly formatted message be received.

This release is fully backwards compatible with the previous release.

2. Changes

2.1 Message Format Error

The M3U Error message (M3U_MSG_M3U_ERROR) has been extended to support a new Error Type 0x5 (M3Ue_MSG_FMT). This is generated when a format error is detected in a message received from the M3UA User.

M3U_MSG_M3U_ERROR parameters Err_val1 and Err_val2 (As defined in the M3UA programmer's manual) are set to the message type and message length of the incorrectly formatted message.

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