Binary for Windows – MTP3

Release Notes for V4.00

1. Overview

This major release of MTP3 introduces support for the dynamic addition, removal and modification of MTP3 links, link sets and routes.

It also offers additional support for use in Japan and the ability for maintenance purposes to poll the internal status of each signalling link.

Full details of messages referenced in these release notes may be found in the MTP3 Programmer's Manual Issue 6.

This release of MTP3 is the first since version 3.01and is fully backward compatible.

2. New Functionality

2.1 Dynamic Configuration

Dynamic configuration allows the removal, addition and modification of a system without it being reset or without removal of any part of the system from service. For instance it may be necessary to add a new link set to an adjacent switch while your application continues to communicate with an existing switch over another link set. Or it may be necessary to change a route to use an additional link set.

This functionality allows greater flexibility and scalability of systems while maintaining high service availability.

Dynamic configuration allows the following configuration events:

- Addition of link sets
- Addition of routes
- Removal of link sets
- Removal of routes
- Modification of link sets
- Modification of routes

These require the use of the existing Link Set, Link and Route configuration messages and the new Link Set, Link and Route End messages.

Note: Whilst the ability to add new routes is now supported, the module does not currently allow for routes to be removed. Furthermore it is not possible to dynamically add routes to an adjacent signalling point or routes for which the PSEUDO_DPC flag is set.

2.2 Enhancements for use in Japan

Minor enhancements have been added to support Japan-specific MTP functionality. These include, using the least significant bit of the SLS to determine which link set to use for load sharing and the ability to support receipt of up to 16 DPC's in received TFP/TFA messages.

For correct operation of these features MTP3 must be configured both for Japanese operation and to use 16 bit point codes. This is achieved by setting bits 21 and 20 respectively in the <options> field of the MTP_CONFIG command.

The release also supports the ability for the user to initiate the Japanese-specific Signalling Route Test (SRT) procedure and the ability to manipulate the SLS field to support Japan-specific usage. Further information on these features is available on request.

2.2 MTP Link Status

A new message, MTP_MSG_R_LK_STATUS, has been added to allow the user to poll, on-demand, the current per-link availability of a signalling link.

The message may be sent to MTP3 at any time after the link has been configured. The sending module should ensure that the parameter area of the message contains sufficient space for the response and will identify the MTP3 link in the id field of the message in terms of linkset_id and link_ref (in line with other per-link MTP3 requests). A confirmation must be requested and this will contain the current availability as detailed in the message specification below.

It is recommended that any application wishing to read the status of multiple links waits until the response is received for each link before requesting the status of subsequent links. This avoids instantaneous peaks of messages in the system.

Binary for Windows – MTP3

Release Notes for V4.01

1. Overview

This release of MTP3 offers support for 12 bit sequence numbers. This release also corrects a load sharing anomaly when using more than 8 links in a link set and provides enhancements to the management of the MTP3 rerouting buffers.

The release is fully backward compatible with the previous release.

2. New Functionality

2.1 Support for 12 bit sequence numbers

This version of MTP3 introduces support for an optional flags field in the SS7_MSG_RXD_BSNT indication sent from Layer 2 to MTP3. This flags field is used to indicate whether the sequence number is a 12 bit number and is used by MTP3 to choose between Changeover Order (COO) and Extended Changeover Order (XCO) message formats. This functionality is necessary when using Layer 2 Links with 12 bit Sequence Numbers and ANSI format COO messages.

3. Other Changes

3.1 Rerouting buffer management

This release incorporates enhancements to the management of the MTP3 rerouting buffers in order to reduce the chances of the buffer contents being discarded due to overload. The rerouting buffers are used during the Forced Rerouting and Controlled Rerouting procedures and typically hold up to about 1 second worth of traffic which under load may be a significant number of messages. If the total number of messages stored causes the system to go into overload then messages are discarded and an event indication (MGT_MSG_EVENT_IND) is generated by MTP3 with an error_code of 0x67 (MTP_RRT_OVRFLW). Recovery from this condition is fully automatic. Previously a fixed, relatively low, threshold was used to determine when to discard messages.

3.2 Load Share across link sets

This release corrects an anomaly that previously prevented some links being used for traffic when attempting to load share across two link sets with more than 8 links in a link set.

For systems with link sets containing 8 or less signalling links there is no change to existing operation and SLS bit 3 is used to control load sharing between link sets.

For systems containing more than 8 links in a link set, providing there are 5 or more bits in the SLS then bit 4 is used to control load sharing between link sets. In systems with only 4 bit SLS values (eg. ITU-T operation) the first link set is always selected as preferred link set.

NOTE: When configured for Japanese operation, SLS bit 0 is used to control load sharing across link sets and this change has no impact.

Dialogic
16-Feb-06

Binary for Windows – MTP3

Release Notes for V5.00

1. Overview

This is the first release since V4.01 and is functionally equivalent to that release. This release is developed for use with the SS7 Development Package for Windows V5.00 or later. It cannot be used with earlier development packages.

Customers who wish to make use of the Long Message support offered in V5.00 of the development package should upgrade to this release of software (Long Message support is required for SCCP Segmentation). Other customers need not upgrade.

2. Changes

2.1 Use of Windows DLL

This release makes use of the DLL version of the GCT library included in V5.00 of the development package. The module has not been changed to support Long Messages itself but it does permit the module to be used in an environment where Large Messages are being used.

Dialogic
21-Jul-06

Binary for Windows– MTP3

Release Notes for Version V5.03

1. Overview

This major release introduces several new pieces of functionality including MTP Restart procedures and increases the capacity of MTP3 to support 4096 routes and 256 links. It is the first full release since V5.00.

This is the first Windows release to support MTP Restart procedures. These procedures are used when the local signalling point or adjacent signalling point recovers from network isolation. This functionality is relevant to any system connecting to the signalling network via signalling transfer points which support restart procedures or to any dual systems.

This release also adds the following functionality

- ANSI SLS rotation defined in T1.111.5
- Enhanced load sharing across links in a link set
- Enhanced Route statistics
- Local Link Inhibit statistics

In addition to the above, this release also addresses a potential issue in dual systems concerning the synchronisation of route status on recovery of the inter-chassis link when of the order of 128 routes are configured.

This release is fully backward compatible with the previous release.

2. New Functionality

2.1 Increased route capacity

This release supports an increased number of routes and associated resources as summarised in the table below.

Number of Links	256
Number of Linksets	64
Number of Routes	4096

It is recommended that customers using large numbers of routes should have at least twice as many messages configured in their GCT

environment as they have routes. The number of messages in the GCT environment may be set using the system.txt 'NUM_MSGS' command documented in the 'Software Environment Programmer's Manual'

2.2 MTP3 route statistics

This release increases the statistics information available for each MTP Route. The new statistics allow the traffic transmitted to and received from each route to be monitored for maintenance purposes. The new Read Route Statistics Request (**MTP_MSG_R_RT_STATS**) message definition including a description of each parameter is shown below.

The message is used by management to request that the module produces a report in accordance with ITU-T Q.752 of the statistics relating a particular route. The statistics are written into the parameter area and the message is returned to the sender. The internal statistics can be reset by setting status = 1 or left unchanged if status = 0. The dpc field in the param area must be initialised by the sending module.

If this message is received with a parameter length of less than 36 bytes but of at least 16 bytes then only the first four parameters will be returned. This allows backwards compatibility with the previous message format.

Message Format:

MESSAGE HEADER	
FIELD NAME	**MEANING**
Type	**MTP_MSG_R_RT_STATS** (0x6319)
Id	0
Src	Sending module id
Dst	MTP3 module id
rsp_req	Must be used to request a confirmation
Hclass	0
Status	0 - Read statistics without modification. 1 - Read and reset statistics.
err_info	0
Len	36

PARAMETER AREA		
OFFSET	**SIZE**	**NAME**
0	4	**dpc**
4	4	**version**
8	4	**unavail_count**
12	4	**unavail_dur**
16	4	**stats_period**
20	4	**tx_msg_count**
24	4	**tx_octet_count**

28	4	**rx_msg_count**
32	4	**rx_octet_count**

Parameters

dpc
The destination point code for which statistics are requested. Should be initialised by sender.

version
Set to zero, Reserved for future use.

unavail_count
This counts the number of times the route has transitioned to the unavailable state.

unavail_dur
The sum of the time the route has been unavailable (Units of 100ms).

stats_period
The time since the system started or since the last stats reset (Units of 100ms)

tx_msg_count

The number of messages transmitted to Layer 2 for the route.

tx_octet_count
The number of octets transmitted to Layer 2 for the route. This includes SIF and SIO octets.

rx_msg_count

The number of messages received from Layer 2 for the route.

rx_octet_count

The number of octets received from Layer 2 for the route. This includes SIF and SIO octets.

2.3 MTP3 Restart Procedures

Restart procedures are intended to allow time for recovering signalling points to synchronise their routing tables and ensure sufficient links are available before allowing signalling traffic to restart. Procedures are defined for the restart of the local signalling point and for the restart of adjacent signalling points.

This release is the first to support a per link set configuration option to allow both local and adjacent restart procedures to be enabled for the concerned link set. If enabled then the system will operate as described in the following paragraphs. To support these procedures

new event indications are sent to layer management to indicate when local and adjacent restart procedures have both commenced and completed. These indications are defined as additions to the MGT_MSG_MTP_EVENT message. Restart procedures use a number of timers which have been made configurable on a system wide basis. These have been added to the existing timer configuration message as defined below.

2.3.1 MTP LINKSET Configuration Option

The following configuration option has been added to the MTP_MSG_CNF_LINKSET flags field.

Bit	Meaning
3	This bit is used to determine whether or not to enable restart procedures for this link set. 0 – Restart procedures are not enabled on this link set. 1 – Restart procedures are enabled on this link set.

2.3.2 Restart Management Event Indications

The following event codes have been added to the MGT_MSG_MTP_EVENT message

Value	Mnemonic	Parameter	Description
17	MTPEV_LCL_RST	0	Local Restart Commenced
18	MTPEV_ADJ_RST	linkset	Adjacent Restart Commenced
19	MTPEV_LCL_RST_CMP	0	Local Restart Complete
20	MTPEV_ADJ_RST_CMP	linkset	Adjacent Restart Complete

2.3.3 Restart Timer Configuration

The MTP_MSG_CNF_TIMERS message has been extended as shown below.

MESSAGE HEADER	
FIELD NAME	**MEANING**
type	**MTP_MSG_CNF_TIMERS** (0x7317)
id	0
src	Sending module id
dst	MTP3 module id
rsp_req	used to request a confirmation
hclass	0

status		0
err_info		0
len		66
PARAMETER AREA		
OFFSET	**SIZE**	**NAME**
0	2	version - Must be set to zero.
2	2	Timer T1
4	2	Timer T2
6	2	Timer T3
8	2	Timer T4
10	2	Timer T5
12	2	Timer T6
14	2	Timer T7
16	2	Timer T8
18	2	Timer T9
20	2	Timer T10
22	2	Timer T11
24	2	Timer T12
26	2	Timer T13
28	2	Timer T14
30	2	Timer T15
32	2	Timer T16
34	2	Timer T17
36	2	Timer T18 (ITU) or T23 (ANSI)
38	2	Timer T19 (ITU) or T29 (ANSI)
40	2	Timer T20 (ITU)
42	2	Timer T21 (ITU) or T25 (ANSI)
44	2	Timer T22 (ITU) or T20 (ANSI)
46	2	Timer T23 (ITU) or T21 (ANSI)
48	2	Timer T24
50	2	SLTC Timer T1
52	2	SLTC Timer T2
54	2	Timer T101
56	2	ANSI Timer T22
58	2	ANSI Timer T24
60	2	ANSI Timer T26
62	2	ANSI Timer T27
64	2	ANSI Timer T28

2.3.4 Local Restart Procedures

Local restart procedures commence when the first link set with the restart option enabled becomes available. Restart requires at least 50% of the links configured within link sets with the restart option to be active before restarting traffic and at least one Traffic Restart Allowed (TRA) message to be received. Once these conditions are met TRA messages are generated and restart procedures complete.

ANSI restart procedures include a period of forced isolation for a few seconds during which links are prevented from coming into service. Should this functionality be required then layer management should deactivate the links for this time.

2.3.5 Adjacent Restart Procedures

Adjacent Restart Procedures start when a link set with the restart option enabled comes into service and the local system is not restarting itself. MTP generates a TRA message and then waits to receive a TRA message from the peer before allowing traffic to be restarted.

Note: Generation of Route Set Test messages is not suppressed during local or adjacent restart. This should not impact system operation.

The use of restart procedures is recommended for inter-chassis link sets on dual systems. This will help a restarting system to come into service with the route status synchronising cleanly to the correct state.

2.4 ANSI SLS Rotation

ANSI SLS Rotation is now supported for Eight bit ANSI systems as defined in ANSI T1.111.5. These procedures requires link set selection to be made using bit Four of the SLS and for the lowest Five bits to be rotated.

To enable this functionality bit Seven (0x0080) of the MTP3 extended options field should be set in the MTP_MSG_CONFIG (0x7303) message.

3. Changes

3.1 MTP3 Route Reconfiguration

When reconfiguring a Route using load-sharing with at least one link set with more than eight links will force the system to start using 24-bit format routing labels. This is now corrected.

3.2 Dual System Inter Link

When a dual system inter-link comes into service, route status information is transmitted to the partner. If more than 128 routes are configured then this information has the potential to flood the layer 2 link transmit buffer causing some of these messages to be discarded. This release prevents this by transmitting the messages over a short period of time. It is recommended that the restart option is used on the dual inter-link though this is not a requirement.

3.3 Load sharing across links in a link set

Previously, link sets with more than eight and less than sixteen links may be unevenly loaded when all links were available. Links will now be fairly loaded across all links.

3.4 Local Inhibit Statistics

The reporting of Local Inhibit statistics had not previously been working. This has been fixed in this release and works as documented in the MTP3 Programmer’s Manual.

Dialogic
24-Sep-08

Binary for Windows– MTP3

Release Notes for Version V5.04

1. Overview

This release adds the ability to send trace messages to a nominated Trace module and corrects handling of route modification and default routes.

The release is fully backward compatible with the previous release.

2. New Functionality

2.1 Addition of trace module id to configuration message

A Trace Module ID can now be configured using the module configuration message (MTP_MSG_CONFIG, 0x7303). The new '**trace_id**' parameter uses a previously reserved field in the message.

If trace_id is defined as non-zero, all trace messages are sent to that module id. By default or if trace_id is set to zero, trace messages are sent to the Management Module ID (mngt_id) as for previous releases.

The format of the MTP3 Module Configuration Message is now defined as:

MESSAGE HEADER		
FIELD NAME		**MEANING**
Type		**MTP_MSG_CONFIG** (0x7303)
Id		0
Src		Sending module id
Dst		MTP3 module id
rsp_req		used to request a confirmation
Hclass		0
Status		0
err_info		0
Len		40
PARAMETER AREA		
OFFSET	**SIZE**	**NAME**
0	2	**options** - Run-time options
2	1	**module_id** – Reserved, should be set to 0.
3	1	**mngt_id**- Module id of management module
4	2	**tx_pool_size** - Transmit pool size
6	2	**timer_res** – Reserved, must be set to 1.

8	4	**point_code** – Default Local Point code for MTP3.
12	2	**num_links** - Total number of links
14	2	**num_linksets** Total number of link sets
16	1	**ssf** – Default Sub-Service field value
17	1	**trace_id** – Trace module id
18	4	Reserved for future use, must be set to zero
22	2	**ext_options** – Extended run-time options
24	16	**user_id** - Module id for each of the 16 user parts.

trace_id
Module identifier defining the destination for all trace messages.

3. Changes

3.1 Route Modification & Load sharing

When a Route is configured to load share across two link sets then the exact load share behaviour is governed by the number of links in the link sets, the number of SLS bits available, and whether SLS Rotation is enabled. If a route modification was made with the previous release then it is possible that incorrect load sharing behaviour was enabled. This issue has been fixed in this release.

3.2 Default Route Failure

Incorrect handling of Route Statistics in the earlier MTP3 Binary V5.03 caused the module to fail when a message is routed using the default Route. This has been fixed in this release and any deployments looking to make use of Default Route functionality should first upgrade to this release of MTP3 or later.

Dialogic
14-Jan-09

Binary for Windows– MTP3

Release Notes for Version V5.05

1. Overview

This release implements several parameters that were defined in the Link Statistics message (MTP_MSG_R_LK_STATS) but not implemented.

It also corrects the default value of ANSI Traffic Restart Waiting Timer T28 and an issue with the configuration of Pseudo DPC routes.

The use of trial mode is now limited to one hour but in all other respects this release is backwards compatible with the previous release.

2. Changes

2.1 MTP3 Link Statistics

Three previously unsupported measurements have been added to the link statistics report using existing fields in the MTP_MSG_R_LK_STATS message: Remote inhibit duration, link failed duration, and RPO duration. In addition the calculation of local inhibit duration has been corrected.

2.2 ANSI Traffic Restart Waiting Timer T28

The default value of the ANSI Traffic Restart Waiting timer has been changed from 1 to 10 seconds to align with the ANSI specification.

2.3 Pseudo Default Route configuration

When a Default Route with a pseudo point code is configured, the Route Set Test procedure is automatically disabled (rather than requiring the user to explicitly disable it in the configuration message).

2.4 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.

Dialogic
28-Jan-10