Binary for Windows – ISUP

Release Notes for V6.00

1. Overview

This is the first release since V5.06 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
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Binary for Windows - ISUP

Release Notes for Version 7.01

1. Overview

This release adds support for Bearer Independent Call Control protocol (BICC) and ISUP'2000. Both modes are configured using the per-group variant handling mechanism. The use of BICC requires a new software license (IMN SS7SBHSTBICC).

In addition, this release also provides support for extended location values in the release cause, corrects the handling of the National Forward Call Indicator (link by link) parameter in UK ISUP, corrects the handling of timer T4 that caused UPT messages to be sent intermittently instead of at intervals of T4 and the receipt of MTP-STATUS with status "Remote user unavailable" indicating "unknown" which prevented new outgoing calls to be setup and support for multiple MTP3 module IDs in ISUP.

New per circuit group options allow the full range of location values to be provided in the release cause (see section 2.4 for further details). It is recommended that the ISPX1GOP_LOC_LPN per circuit group option from release V5.06 should no longer be used as the enhanced location value functionality in this release provides equivalent functionality.

This release is the first generally available release since V6.00.

These release notes should be read in conjunction with the ISUP Programmer's Manual Issue 13 (or later).

2. New functionality

2.1 ISUP'2000

This release adds support for the 2000 version of the ISUP protocol (ISUP'2000 as defined in ITU-T Recommendations Q.761 – Q764 and Q.765.5. To use ISUP'2000, the 'variant' field in the Configure Circuit Group Request message should be set to ISPGVAR_ITU2000.

When configured for ISUP'2000 operation, ISUP supports the Subsequent Directory Number message as detailed below. This primitive is used by the application to convey subsequent directory number address digits to the network when overlap signalling is employed. It applies only to ITU-T operation and is not used for ANSI operation.

Primitive	Message type	Value		Use
Subsequent Directory Number	SDM	67	0x43	Subsequent directory number digits for overlap signalling

The message takes one mandatory parameter (Subsequent Number) and one optional parameter (Message Compatibility Information) as detailed in the ISUP Programmer's Manual.

The following additional parameters as defined in Q.1902.3 are now supported:

Parameter Name	Value		Length	
Automatic rerouting	0x8e	150	1	2
Called directory number	0x1ed	493	2	18
Calling geodetic location	0x81	129	8	255
Calling party geodetic velocity information	0x83	131	4	255
CCNR possible indicator	122	0x7a	1	1
Coding decoding processing	0xa5	165	1	255
Global call reference	0xa4	164	6	255
HTR information	0x82	130	2	18
Inter nodal traffic group identifier	0xa3	163	1	255
Network routing number	0x84	132	1	18
Number portability forward information	0x8d	141	1	255
Original Called IN number	0x7f	127	2	18
Pivot capability	0x7b	123	1	1
Pivot counter	0x87	135	1	1
Pivot routing backward information	0x89	137	1	255
Pivot routing forward information	0x88	136	1	255
Pivot routing indicators	0x7c	124	1	1
Pivot status	0x86	134	1	1
Query on Release Capability	0x85	133	1	1
Redirect backward information	140	0x8c	1	255
Redirect forward information	139	0x8b	1	255
Redirect status	0x8a	138	1	1

2.2 Bearer Independent Call Control (BICC)

The ISUP module provides support for the Bearer Independent Call Control (BICC) protocol (as defined in ITU-T Recommendations Q.1902.1 – Q1902.5 and Q.765.5) and for the Signalling Transport Converter (MTP3/M3UA STC) layer (as defined in ITU-T Recommendation Q.1901. BICC-specific configuration is detailed in Appendix A.9 of the ISUP Programmer's Manual issue 13.

The software licence for BICC is part number SS7SBHSTBICC. BICC capability is licensed as a superset of ISUP so users with an

appropriate BICC licence are able to use all ISUP variants whilst users with an ISUP license can use all variants except BICC.

BICC is based on ISUP'2000. All messages supported on ISUP'2000 are also supported on BICC, with the exception of the following: Blocking, Blocking Acknowledge, Continuity Check Request, Loop back acknowledgement, Overload, Pass-along, Unblocking, Unblocking acknowledgement, User part available, User part test.

All parameters supported on ISUP'2000 are also supported on BICC with the exceptions of the following parameters: Circuit assignment map, Coding decoding processing, Connection request, Signalling point code.

In addition, the following parameter defined in Q.1202.3 section 6.35 is supported in BICC:

Parameter Name	Value		Length	
IN service compatibility	0xa2	162	1	255

Refer to Section 9.7.8 in ISUP Programmer's Manual issue 13 for further details about the BICC Application Transport mechanism.

Two new error event indications , ISPe_APM_LOW (10) and ISPe_NO_APM (17), have been added to the ISP_MSG_ERROR_IND Message. In addition new maintenance event indications (values 63 .. 71) have been added to the ISP_MSG_MAINT_IND message. For further details refer to the ISUP Programmer's Manual.

2.3 ISUP/BICC timers

Timers may now be configured to run without expiring by setting the required timer value at run-time to 0. In previous releases, setting a timer to 0 was unspecified operation and typically caused the timer to expire after approx 10 minutes.

2.4 ISUP location values

The ISUP library now supports the full range of location values in the cause parameter. The user must configure the required location value using the new per-circuit group options, ISPX1GOP_SET_LOC and ISPX1GOP_LOC (bits 11 -15 of the <ext_1_options> field in the Configure Circuit Group Request message) at run-time as follows:

Bit Number	Mnemonic	Description
10	ISPX1GOP_LOC_LPN (Reserved)	Sets the location value, “LPN” or “RPN”, to be indicated in the cause parameter during call release. If set to 1, the location value will be set to “0x01= Private network, local user (LPN)”. If not set, the location value will be set to “0x05 = Private network, remote user (RPN)”. **Note:** For new applications, this option should be set to zero. Users are advised to use options ISPX1GOP_LOC and ISPX1GOP_SET_LOC instead. This option is retained for backwards compatibility.
11	ISPX1GOP_SET_LOC	Used in conjunction with ISPX1GOP_LOC to set the location value to be indicated in the cause parameter. If set to 1, the location value in the cause parameter will be determined by the 4-bit ISPX1GOP_LOC option. **Note:** If enabled, this option will override any value set by the ISPX1GOP_LOC_LPN option.
12-15	ISPX1GOP_LOC	Sets the location value to be indicated in the cause parameter during call release. The following cause location values are defined: 0x00 - “User (U)” 0x01 - “Private network, local user (LPN)” 0x02 - “Public network, local user (LN)” 0x03 - “Transit network (TN)” 0x04 - “Public network, remote user (RLN)” 0x05 - “Private network, remote user (RPN)” 0x07 - “International (INTL)” 0x0a - “Beyond interworking point (BI)” 0x0c - “Reserved” 0x0d - “Reserved” 0x0e - “Reserved” 0x0f - “Reserved”

Note: If none of the above options are set then the module will use a location value of 0x05 - “Private network, remote user (RPN)”.

2.5 Support for multiple MTP3 module IDs

If the configuration associates a number of network contexts to the same destination point code, the ISUP module may now discriminate from which network context messages are received from and handle indications pertaining to a particular network context by its MTP module ID (specified at run-time on a per-circuit group basis). This means that only notifications associated with a particular MTP3 module (or network context) will be sent by ISUP without impact to operation concerning other network contexts configured in the system. For example, if two network contexts (0 and 1) are configured with the same destination point code and an MTP-PAUSE was received from Network Context 0, only indications associated with that network context will be indicated and all new calls for that destination will be blocked. In previous releases, this was not supported and if an MTP-PAUSE was received, this would affect all networks contexts associated with the same destination point code.

It should be noted that in order make use of this functionality, the module ISPF_GSPS option (bit 6), in the Configure Request message (0x7700) must be enabled.

3. Other changes

3.1 UK ISUP: National Forward Call Indicator(link-by-link) parameter

For UK ISUP, a length of one octet may now also be specified for the optional National Forward Call Indicator (link-by-link) parameter in the IAM.

In previous releases, a one-octet National Forward Call Indicator(link by link) parameter was not supported and if received this caused the parameter to be subsequently discarded from the message. Discarding the parameter did not prevent the call from being setup.

3.2 Outgoing calls fail after receipt of MTP-STATUS

A remote user is deemed to be ‘unavailable’ when ISUP receives a MTP-STATUS message with status “Remote user unavailable” indicating “unknown”. If subsequent messages are received from the remote user, the remote user is deemed to be ‘available’ once again and outgoing calls to the remote user are allowed.

In previous releases, following the reception of messages from the remote user part, new calls to the unavailable remote user part were prevented and subsequently released with cause #38.

3.3 Handling of timer T4

Timer T4 is now handled correctly such that when the per-circuit group ISPX1GOP_SEND_UPT option is enabled, if no response is received from the remote user, ISUP will now re-send UPT messages to the remote user at intervals of T4 when timer T4 expires.

In previous releases, although the User Part Unavailability procedure was started i.e. the UPT message was sent and timer T4 was started, subsequent indications of UPT were sent intermittently.

Dialogic
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Binary for Windows - ISUP

Release Notes for Version 7.02

1. Overview

This release adds support for configurations with a SIF length longer than 272 octets. This can be used, for example, with SIGTRAN systems using BICC over M3UA.

If using extended SIF lengths then the system must be configured with an appropriate number of large message structures (LMSGs). See the appropriate Development Package documentation and release notes for further details.

If configuring the extended SIF length support using the s7_mgt utility then V4.08 or later must be used.

In addition, this release includes support for INR messages that contain no optional parameters, automatic rejection of specific CUG calls and enhanced support for German ISUP.

This release also corrects the handling of user RLC following local release and handling of the BICC Application Transport parameter if received with no data present in the EAI field.

This release is fully backwards compatible with the previous release.

2. New Functionality

2.1 Extended SIF length support

The module can now be configured to accept and output longer SIF lengths. This is necessary to support configurations which require a SIF length longer than the normal 272 octet limit.

The <max_sif> parameter in the Configure Request message (0x7700) identifies the maximum size of messages that can be sent to the network. Messages to and from the User Application are limited only by the size of the GCT messages.

The max_sif parameter can be set to values of up to 4200 octets, but this will be too large for most networks and typically a smaller value should be selected, e.g. 544 octets.

A new Software Event code is added for the ISP_MSG_ERROR_IND message (0x070b) - ISPe_NO_MSG. This event will occur when the module cannot allocate a long message structure (LMSG). Under such conditions, the user should consider re-configuring the GCTLOAD module to make more LMSGs available.

Note: No event is reported when there are no short GCT messages (since a short GCT message would be required to report the event).

Status		Mnemonic	Id	Parameter 1	Parameter 2	Description
18	0x12	ISPe_NO_MSG	0	0	0	The pool of GCT long messages has been exhausted. If this event occurs then correct operation of the module is not guaranteed.

The formatting of messages for transmission to the network are inspected to determine if the received message length exceeds the configured <max_sif> value. If the length of the message exceeds the permitted length, optional parameters are silently discarded until the message length is within the permitted range. On the first occasion when discard is deemed necessary (after module configuration), a new Maintenance Event Indication (ISP_MSG_MAINT_IND, 0x70a), CCm_GEN_Param_discard, will be sent. This maintenance event will only be reported once to avoid overwhelming the Maintenance module with these events.

Status		Data	Mnemonic	Description
72	0x48	0	CCm_GEN_Param_discard	Parameters have been discarded from a message sent to the network layer due to message size limitations. This event will only be reported once.

2.2 Formatting of messages with no optional parameters present

A new per-circuit group option, ISPX1GOP_NO_EOOP (0x00080000, bit 19), has been added to the ‘ext_1_options’ field in the Configure Circuit Group Request (ISP_MSG_CNF_GRP, 0x7701) message.

When enabled this will allow INR messages containing no optional parameters to be transmitted to the network without the End of Optional Parameters octet or the optional part pointer. This option should only be enabled for ITU variants where no optional parameters are permitted in the INR message.

The default behaviour of the module is to add the End of Optional Parameters octet to the end of messages (where optional parameters are possible) when no optional parameters are present as before.

2.3 Enhance support for German ISUP

This release extends support for German ISUP. When the variant (ISPGVAR_GER, 0x03) is selected in the Configure Circuit Group Request (ISP_MSG_CNF_GRP, 0x7701) message, the following additional parameters are supported in the IAM message:

ITU Parameters	
0x6e	Call diversion treatment indicators
0x70	Call offering treatment indicators
0x6f	Called IN number
0x72	Conference treatment indicators
0x4b	CCSS
0x7a	CCNR
0x73	Display information

German ISUP specific parameters:

Parameter Name	Parameter Value				Mandatory /Optional Parameter	Length		Message used
	German ISUP		API					
	Hex	Dec	Hex	Dec		Min	Max	
NP.FF [Nationaler Parameter in der IAM]	0xff	255	0x1f8	504	Optional	1	1	IAM
NP.SSP [Nationaler Parameter für den Service Switching Point]	0xf5	245	0x1f9	505	Optional	1	2	IAM
NP.UKK [Nationaler Parameter für die Ursprungskundenkennug]	0xfc	252	0x1fa	506	Optional	1	3	IAM

2.4 Auto reject CUG calls

A new per-circuit group option, ISP1GOP_NOCUG (0x00100000, bit 20), has been added to the ‘ext_1_options’ field in the Configure Circuit Group Request (ISP_MSG_CNF_GRP, 0x7701) message.

When enabled incoming calls will be automatically released with cause #29 when the Closed user group call indicator, in the Optional Forward Call Indicators parameter, is set to “closed user group call, outgoing access not allowed”.

3. Changes

3.1 Zero length EAI field in Application Transport parameter is rejected

In previous releases, zero length data Encapsulated Application Information (EAI) fields in the Application Transport parameter caused the received IAM message to be rejected with maintenance event status CCm_APP_len_err_2 (0x42). The processing of this parameter has now been corrected to accept zero length data EAI fields.

3.2 Receipt of user RLC following local release

If it is determined that an incoming call must be locally released, for example, if user to user service requests are not supported in the IAM, and if ISUP subsequently receives an RLC in response from the User (instead of REL), the received RLC is no longer conveyed to the network, but is replaced with a REL, with appropriate cause value, which is sent to the network. In previous releases the received RLC from the user was conveyed to the network.

Dialogic
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Binary for Windows - ISUP

Release Notes for Version 7.03

1. Overview

This release enhances the ISUP application heartbeat mechanism so that it can be used in conjunction with BICC which does not support the concept of hardware blocking.

It also adds circuit utilisation measurements for ISUP circuit groups and support for 8-bit SLS values for use with 24-bit Point Codes. The release also includes enhancements to the operation of management resets to ensure circuits are fully returned to the idle state irrespective of the operational state of the application. This release includes further changes as detailed.

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. New Functionality

2.1 Application Heartbeat for BICC

Prior to this release, when the ISUP heartbeat timer expired ISUP would send a hardware-blocking message to the remote signaling point for each affected circuit group. As BICC does not support hardware-blocking the functionality has been modified such that on heartbeat timer expiry for BICC circuit groups will send a circuit group reset message followed by maintenance-blocking message.

2.2 Circuit Group Statistics

ISUP now gathers a number of call completion and circuit occupancy statistics on a per circuit group basis which can be read on-demand by the user and optionally reset. The following statistics are gathered:

- Number of Incoming call attempts
- Number of Outgoing call attempts
- Number of Incoming calls answered
- Number of Outgoing calls answered.
- Total call duration of completed calls.
- Maximum number of circuits active at one time.

These statistics can be assessed using the following new ISUP message:

MESSAGE HEADER	
FIELD NAME	**MEANING**
type	**ISP_MSG_R_GRP_STATS** (0x6719)
id	GID
src	Sending module_id
dst	**ISP_TASK_ID**
rsp_req	Sending layer's bit must be set
hclass	0
status	Set to 1 to reset the measurements or 0 to leave measurements unmodified
err_info	0
len	32

PARAMETER AREA		
OFFSET	**SIZE**	**NAME**
0	1	**version** – must be set to zero.
1	3	**Reserved**
4	4	**period –** The measurement period.
8	4	**ic_attempt** – Incoming call attempts
12	4	**og_attempt** – Outgoing call attempts
16	4	**ic_answered** – Incoming calls answered
20	4	**og_answered** – Outgoing calls answered
24	4	**duration –** Total accumulated call duration for completed calls in the group
28	4	**max_device –** Maximum number of devices busy at one time

2.3 8-bit SLS Support

This release introduces optional support 8-bit SLS values for use in US networks. Selection of 8 bit SLS values is achieved using a new per circuit group option, ISPX1GOP_SLS8 (bit 22, 0x00400000), in the ext_1_options field of the ISP_MSG_CNF_GRP message. This is bit 22 of the <options2> parameter in the ISUP_CFG_CCTGRP command in config.txt.

When ISUP has been configured for 24 bit point codes and the ISPX1GOP_SLS8 option has been set ISUP will set the SLS to the 8 least significant bits of the CIC otherwise it will set the SLS to 5 bits.

3. Other Changes

3.1 No release on CUG allowed

Now allows CUG calls be conveyed provided that the Closed user group call indicator, in the Optional Forward Call Indicators parameter, is not set to “closed user group call, outgoing access not allowed”.

3.2 Support for reception of Forward CPG

Support for the reception of a CPG in the forward direction can be enabled using the option ISPX1GOP_IC_CPG in the ext_1_options field of the Circuit Group Request configuration message (0c7701).

3.3 Receipt of user RLC following user REL

ISUP now guards against the sending of a User RLC, to the network, immediately after sending User REL. Previously, if received the RLC from the User was conveyed to the network.

3.4 Management Reset

Operation of Circuit Group Supervision Management Reset requests has been enhanced to ensure that circuits are fully returned to the idle state irrespective of the operational state of the application.

Previously the circuit was not returned to the idle state until a valid RLC had been received from the application for any circuits that had been carrying active calls prior to the reset. Whilst under normal operating conditions this was fine it could lead to issues in situations where the reason for the management reset was that the application had crashed or had been restarted. Under such conditions the application would not have generated the RLC. The new mode of operation will ensure that in this scenario the restarted application can immediately start receiving calls.

3.5 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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