

Kofax Communication Server

PBX Integration Technical Manual

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The logo for Kofax, consisting of the word "KOFAX" in a bold, blue, sans-serif font.

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Chapter 1

Preface

This manual summarizes all available PBX-related information that is necessary to perform a good integration with TC/Model 305 Line Server with those legacy PBX platforms that were tested and validated by Kofax.

The *General PBX Requirements* chapter provides a list of the PBX features available (that may be required for integration with Kofax products). Note that the complementary Kofax features are described in detail in the *ISDN Technical Manual*.

The *Validated PBX Cross Reference* summarizes the information which TCSP release was validated for a particular PBX feature/PBX type/PBX release. Please note that the TCSP release does not have to be an officially released package. This can happen if some code changes had to be implemented to support a particular PBX. In this case Kofax can create an internal TCSP that supports this PBX, document its release number in this manual and support this PBX officially in the next released TCSP.

For the time period the PBX is supported only by an internal TCSP (but not released one) its support may be done via module updates or even by delivering an internal TCSP for specific customer (via standard reporting mechanism).

The chapter *Validated PBX Integrations* provides for the PBX related configuration information and hints how to setup the particular PBX for a required Kofax integration.

Important The Kofax Communication Server and its components formerly used the name TOPCALL. Some screen shots and texts in this manual may still use the former name.

Disclaimer

1. PBX configurations described in this manual should be seen as examples of a working Kofax – PBX integration. They do not replace a PBX System Manual, an experienced PBX technician and do not describe the meaning of all PBX parameters.
They only attempt to point out those PBX parameters/settings that may be critical for a successful Kofax integration.
2. Kofax does not guarantee that any other problems not detailed in this manual would not occur.
3. Kofax recommends to implement the particular integration based on the same or newer PBX software release as documented in this manual.
4. PBX functions and parameters explicitly listed in this manual may vary more or less in newer PBX software releases. It is the PBX technician's task to find out their counterparts in the newer software releases.

Chapter 2

General PBX Requirements

There are two functionality classes:

1. Standard functionality (like fax/voice call in and out)

This should work with almost every PBX type that supports appropriate protocols, no PBX integration testing with Kofax assistance is necessary prior to the customer installation.

2. Extended functionality

Kofax guarantees to deliver working functionality according to the supported protocol specifications. But as implementations on different PBX platforms may be more or less incompatible, the PBX integration testing with that PBX platforms that has not been tested so far is necessary to be performed prior to the customer installation (see the „PBX Integration Program“).

PBX feature	Description and Usage	Supported standard protocols	Functionality Class/PBX Integration Procedure
Basic Call	Basic in and out call function, necessary for both fax and voice as well	EuroISDN, QSIG, 1TR6, 4ESS (AT&T)	Standard PBX integration tests not necessary
Message Waiting Indication (MWI)	Indication of an incoming message on the telephone's MWI lamp	QSIG	Extended PBX integration tests necessary
Call Transfer (CT)	Switching of two calls via the PBX for TC/Attendant, DialbyName, SimpleCTI functions	QSIG	Extended PBX integration tests necessary
Path Replacement (PR)	Call route optimization after the Call Transfer, necessary for each application using the CallTransfer	QSIG	Extended PBX integration tests necessary
Call Diversion (CD) (CFU, CFNR and CFB) ¹	Redirecting of incoming calls to the KCS Voice server, necessary for basic TC/VoiceAccess functionality	EuroISDN QSIG	Extended PBX integration tests necessary
Advice of Charge (AOC)	Cost accounting for outgoing fax and voice calls	EuroISDN, 1TR6	Standard PBX integration tests not necessary

¹ CFU: Call Forward Unconditional, CFNR: Call Forward not Responding, CFB: Call Forward on Busy

PBX feature	Description and Usage	Supported standard protocols	Functionality Class/PBX Integration Procedure
		QSIG	Extended PBX integration tests necessary

Chapter 3

Validated PBX Cross Reference

The following tables provides for a cross-reference between tested TCSP and TCOSS module release, PBX type and tested function. The “-“ sign means that specific function is not supported/was not validated with specific PBX type/SW release.

1. The 1st release number in the table stands for the TCSP release that was validated
2. The 2nd one (optional, in columns) for the TCOSS module update if it was necessary for the particular integration

TCSP release (TCOSS module release) PBX Type/SW release/ Access type	Protocol	Validated Function(*) PBX Protocol Variant(**)	Basic Call (BC)	MWI	CD	CT	PR	AOC
Alcatel OmniPCX 4400 R3.2/4.2/5.0/6.1 T0 (BRI trunk)/T2 (PRI trunk)	QSIG	ISO-QSIG ETSI-QSIG	7.48.00	7.65.12 (only R6.0 or later!)	7.48.00	7.48.00	7.48.00	-
Siemens Hicom 300 R2.08 S0 (BRI trunk)/ S2 (PRI trunk)	QSIG	ECMAV2 PSS1V2	7.48.00	7.48.00	7.48.00	7.48.00	7.48.00	-
Meridian 1 R25.40b BRI and PRI trunks	QSIG	ISGF	7.50.00	7.50.00	7.50.00	7.50.00	7.50.00	-
Philips Sopho IS3000 R6810.32E	QSIG	realQSIG	7.55.07	7.55.07	7.55.07	7.55.07	-	-
Siemens Hipath4000 R1.0 S0 (BRI trunk)/ S2 (PRI trunk)	QSIG	ECMAV2	7.56.02	7.56.02	7.56.02	7.56.02	7.56.02	

(*) For abbreviations refer to the PBX feature table.

(**) Specific PBX protocol name/variant/implementation that was setup on the PBX side.

Chapter 4

Validated PBX Integrations

This section describes the validated PBX integrations.

Alcatel OmniPCX 4400 R3.2/R4.2/R5.0/R6.1 QSIG Integration

This section describes the integration with Alcatel OmniPCX 4400 R3.2/R4.2/R5.0/R6.1 QSIG.

Test Report

Date	19.03.2003
Location	Korneuburg, Austria
Tested by	Norbert Bartalsky, Kofax
TCSP release	7.48.00
TCOSS module	7.48.00
PBX vendor	Alcatel
PBX Type	OmniPCX 4400
Protocols	ETSI-QSIG and ISO-QSIG
PBX SW release(s)	3.2, 4.3 and 5.0
Tested functions	BC, CD, CT, PR
TestRestrictions Problems Open Questions	MWI is not supported by A4400 R3.x-R5.0, therefore not tested But it is supported since R 6.0 and it was successfully tested with R 6.1 (see “Special Considerations” below) AOC was not tested, as not supported by TC QSIG All test cases were tested only with internal phones, as the test PBX was not connected to the public telephone network During the tests it was not possible to send messages in a loop to the own trunk number (TC->PBX->TC) (this may have been a PBX config issue) It was not possible to send from trunk to trunk (this may have been a PBX config issue)
Summary	Integration tests were successful OmniPCX 4400 is validated to be used with KCS Server Model 305 using both BRI and PRI QSIG connections as well

Specific Considerations/Configuration Hints

1. Trunk Types

Alcatel uses following abbreviations for trunks:

T0 – stands for the ISDN BRI point to point trunk

T2 - stands for the ISDN PRI point to point trunk

Note the “S0” stands for ISDN BRI point to multipoint line (station line) that is not suitable for KCS interconnection!

2. QSIG protocol variants ETSI and ISO

The PBX supports for two QSIG variants – ETSI and ISO – that are not compatible with each other. This can be setup by the system-wide parameter “ISO Function”:

”ISO Function = True” stands for ISO-QSIG (corresponds with KCS standard QSIG config)

”ISO Function = False” stands for ETSI-QSIG (setup in the UIF config line 286, pos. 8)

Note that this parameter is system-wide in the PBX so it has an influence on ALL QSIG trunks connected!

3. QSIG configuration for QSIG supplementary services (QSIG-GF) vvs. QSIG „basic call only“

In order to support QSIG supplementary services (like call diversion, ...) the parameter “TrunkGroups \Q931 signal variant” **MUST be set to ABC-F** (which stands for Alcatel proprietary PBX protocol) and the parameter “Protocol Type” in the associated remote network must be set to QSIG-GF.

If the parameter “TrunkGroups\Q931 signal variant” would be set to QSIG, only the QSIG basic call functionality would be provided (in and out call, no supplementary services).

4. Logical channel numbering with T2 access type (PRI)

The parameter “TrunkGroups\LogicalChannel” MUST be set to 1__30. This corresponds with QSIG convention to use logical B-channel number during the B-channel allocation procedure (on the other hand, public network ISDN protocols like EuroISDN uses the trunk timeslot number instead).

Note that there is no complementary parameter on KCS side. If QSIG is setup on KCS, it always uses the proper channel numbering scheme.

5. Call Transfer restriction with R 3.2

Call Transfer by join “into ringing” does not work with R 3.2. Therefore the Call Transfer by join “into connected” must be configured on the KCS side (UIF config line 295, pos. 5 set to 02)

6. Call Hold & Call Transfer

The 1st (primary call) call of the two calls to be transferred must be put on Hold prior to the transfer (UIF config line 295, pos. 6 set to 01)

7. Message waiting indication (MWI)

This supplementary service has been implemented since Alcatel 4400 release 6.0 and later, and it is supported since TCSP 7.65.12. No special configuration is necessary on the A4400 side (it works fine with the Qsig configuration described below) but it is necessary to set the PBX Model in the UIF configuration:

UIF config line 287, pos. 15-16 set to 00 01 (default: 00 00 stand for all other PBXs)

(as this PBX uses proprietary QSIG-MWI signaling and not the standard-conform one).

If also the callback button on the A4400 phones should work, the “Message Centre ID” parameter of the MWI send order on the KCS side should be set to the “VoiceAccess number” (this number will be dialed after any user presses his callback button). If the “Message Centre ID” would be empty, MWI would work fine, but the callback button not !

Note that if the user presses the callback button on his Alcatel telephone set (in order to listen to his messages on the KCS server), the PBX immediately switches the MWI lamp off. If then later on the KCS server sends the MWI OFF command (as the message has been read), its send order will positively terminate but there will be the error text “returnResultError” in the response field as KCS attempted to switch that lamp off that has already been in the MWI OFF state.

PBX Configuration

This section describes the PBX configuration.

T0 Access (BRI)

```
Alcatel OmniPCX4400 release R3.2 (R3.2-c1.706-7-au-c3s2)
Alcatel OmniPCX4400 release R4.2 (R4.2-d2.101-0-au-c3s2)
Alcatel OmniPCX4400 release R5.0 (R5.0Ux-d2.313-7-I-au-c3s2)
This file describes the configuration of the T0 trunk TG 4 with the prefix 04.
Most of the parameters have their default values: those parameters that were relevant
for KCS configuration, are marked with Bold.
It was generated with the R3.2, but can be used also for R4.2 and R5.0 without
significant changes
(1)dhs338> trkvisu all
output of all Trunk_Groups and Links
-----
Numb  |      Name      |  Type  |  Var.  |      Node      |  Pfx
-----
TG    1 | ISDN-Trunk    |  T0    |  ISDN  |  1 => local    |  01
TG    4 | QSIG          |  T0    |  IPNS  |  1 => local    |  No pfx
TG    8 | QSIG PRA     |  T2    |  IPNS  |  1 => local    |  No pfx
-----
ISO Function Parameter: True for ISO-QSIG or False for ETSI-QSIG
xxxxxxxxxxxx Consult/Modify: Other System Param. XXXXXXXXXXXXXXXX
x
x          Node Number (reserved) : 1          x
x          Instance (reserved) : 1             x
x          Instance (reserved) : 1             x
x
x          Trunk seizure via attendant + True    x
x          No detect.of On-hook tone + True     x
x          TrkGrp in ticket for trans.call + True x
x          VPN service + False                  x
x          ISVPN Node No. : 1                    x
x          Nb Digits displayed on sets : 1       x
x          Melody Ringing Type : 1              x
x          Int.Call Ringing Cadence No : 1       x
x          Ext.Call Ringing Cadence No : 1       x
x          Executive Type Ringing Cadence No : 1 x
x          Priority Call Cadence No : 1          x
x          ISO Function + True                  x ISO-QSIG
x          Booking B Channel + False           x
x          Uncontrol.Business Account Code + False x
x          Business Pref.With Business No. + True x
```

```

x          Project prefix With Code + False          x
x                                                    x
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
Trunk Groups:
The signaling variant must be ABC-F and NOT QSIG and the associated "remote network"
must have the protocol type "QSIG-GF" (see Network Routing Table below).
This is necessary for QSIG supplementary services like call diversion, call transfer
etc.
xxxxxxxxxx Consult/Modify: Trunk Groups xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
x          Node Number (reserved) : 1              x
x          Trunk Group Id : 4                      x
x                                                    x
x          Trunk Group Type + T0                   x
x          Trunk Group Name : QSIG BRA             x
x          Number Compatible With : -1             x
x          Remote Network : 5                      x for QSIG-GF
x          Shared Trunk Group + False              x
x          Special Services + Nothing              x
x          Node number : 1                         x
x          Transcom Trunk Group + False            x
x          Auto.reserv.by Attendant + False        x
x          Overflow trunk group No. : -1           x
x          Tone on seizure + False                 x
x          Private Trunk Group + False             x
x          Security Patrol + False                 x
x          Q931 signal variant + ABC-F            x
x          Number Of Digits To Send : 5           x
x          auto.DTMF dialing on outgoing call + NO x
x          Public Network Category : 0            x
x          DDI transcoding + False                x
x          Can support UUS in SETUP + True         x
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
xxxxxxxxxx Consult/Modify: Trunk Groups xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
x                                                    x
x          Node Number (reserved) : 1              x
x          Trunk Group Id : 4                      x
x          Instance (reserved) : 1                x
x                                                    x
x          Trunk Group Type + T0                   x
x          Public Network Ref. : -----          x
x          VG for non-existent No. + YES           x
x          Entity Number : 0                      x
x          Supervised by Routing + NO              x
x          VPN Cost Limit for Incom.Calls : 0      x
x          Immediat Trk Listening For VPNCall + YES x
x          VPN TS % : 50                          x
x          Csta Monitored + NO                     x
x          Max.% of trunks out CCD : 0            x
x          Ratio analog.to ISDN tax : -----     x
x          TS Distribution on Accesses + YES        x
x          Quality profile for voice on IP + Profile #1 x
x          IP compression type + Default           x
x          Use of volume in system + YES           x
x          Dialling end to end + NO                x
x          DTMF end to end signal. + NO           x
x          Trunk group used in DISA + NO           x
x          DISA Secret Code : -----             x
x          Routing To Executive + NO               x
x          Trunk Category Id : 18                  x
x          Nb of digits unused (ISDN) : 2         x
x          B Channel Choice + YES                  x B-chan.excl
x          Channels Reserved By Attend. : 0        x
x          Dissuasion For ACD + NO                 x
x          DTO joining + NO                         x

```

```

x      Enquiry Call On B Channel + NO          x
x      Automated Attendant + NO              x
x      Calling party Rights category : 0      x
x      TS Overflow + YES                     x
x      Number To Be Added : -----         x
x      Trunk group used in DISA + NO         x
x      DISA Secret Code : -----          x
x      Charge Calling And ADN Creation + NO  x
x      Use Split Access + NO                x
x      Heterogeneous Remote Network + NO    x
x      Barring mode + Not barred            x
x      ARS class of service : 31            x
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
Translator (trunk prefix 04)
xxxxxxx Consult/Modify: Prefix Plan xxxxxxxxxxxxxxxxxxxxxxxx
x
x      Node Number (reserved) : 1           x
x      Instance (reserved) : 1             x
x      Number : 04                         x
x
x      Prefix Meaning + Routing No.        x
x      Network Number : 5                  x
x      Node Number/ABC-F Trunk Group : 4    x
x      Number of Digits : 7                x
x      Number With Sub Address (ISDN) + NO  x
x      Default X25 Id.pref. + NO           x
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
Prefix for Path Replacement:
define a prefix as a local node number
for Path Replacement (e.g. 50400 as below)
xxxxxxx Consult/Modify: Prefix Plan xxxxxxxxxxxxxxxxxxxxxxxx
x
x      Node Number (reserved) : 1           x
x      Instance (reserved) : 1             x
x      Number : 50400                      x
x
x      Prefix Meaning + Local Features     x
x      Local Features + Pabx address in DPNSS x (*)
x
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
(*) With R5.0 this value is "PCX address in DPNSS"
Remote network settings
xxxxxxx Consult/Modify: Network Routing Table xxxxxxxxxxxxxxxx
x
x      Node Number (reserved) : 1           x
x      Instance (reserved) : 1             x
x      Network Number : 5                  x
x
x      Rank of First Digit to be Sent : 3   x
x      Incoming identification prefix : ----- x
x      Protocol Type + QSIG-GF             x
x      Numbering Plan Descriptor Id : 11    x
x      ARS Route list : 0                  x
x      Schedule number : -1                x
x
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
Trunk access:
xxxxxxx Modify: T2/T1/T0 Access xxxxxxxxxxxxxxxxxxxxxxxx
x
x      Node Number (reserved) : 1           x
x      Trunk Group Id : 4                   x
x      Instance (reserved) : 1             x
x      Physical Address : 0-3-0            x
x

```

```

x          Access Type + T0          x
x          Access Cluster Id : -1    x
x          Time Slots T0 : 011       x
x                                     x
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
Digital access:
xxxxxxxxxxx Consult/Modify: Digital Access xxxxxxxx
x                                     x
x          Node Number (reserved) : 1      x
x          Shelf Address : 0              x
x          Board Address : 3              x
x          T0/T2 Access No. : 0           x
x                                     x
x          Access Type + T0             x
x          Synchronisation Priority : 255   x ClkMaster
x          Network Mode + YES           x
x          Max Nb Of Used B Channels : 2    x
x          Max_Nb_Of_Compressed_B_Channels : 0 x
x          TieLine Mode + NO            x
x          Access Type S0 + YES         x
x          Reserved1 + NO               x
x          Reserved2 + NO               x
x          Network Date Time Update + NO x
x                                     x
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

```

T2 Access (PRI)

Alcatel OmniPCX4400 release R3.2 (R3.2-c1.706-7-au-c3s2)
 Alcatel OmniPCX4400 release R4.2 (R4.2-d2.101-0-au-c3s2)
 Alcatel OmniPCX4400 release R5.0 (R5.0Ux-d2.313-7-I-au-c3s2)
 This file describes the configuration of the T2 trunk TG 8 with the prefix 08.
 Most of the parameters have their default values: those parameters that were relevant for KCS configuration, are marked with Bold.

It was generated with the R3.2, but can be used also for R4.2 and R5.0 without significant changes

(1)dhs338> trkvisu all
 output of all Trunk_Groups and Links

Numb	Name	Type	Var.	Node	Pfx
TG 1	ISDN-Trunk	T0	ISDN	1 => local	01
TG 4	QSIG	T0	IPNS	1 => local	No pfx
TG 8	QSIG PRA	T2	IPNS	1 => local	No pfx

ISO Function: True for ISO-QSIG or False for ETSI-QSIG

```

xxxxxxxxxxx Consult/Modify: Other System Param. XXXXXXXXXXXXXXXXXXXX
x                                     x
x          Node Number (reserved) : 1      x
x          Instance (reserved) : 1         x
x          Instance (reserved) : 1         x
x                                     x
x          Trunk seizure via attendant + True x
x          No detect.of On-hook tone + True x
x          TrkGrp in ticket for trans.call + True x
x          VPN service + False              x
x          ISVPN Node No. : 1               x
x          Nb Digits displayed on sets : 1   x
x          Melody Ringing Type : 1          x
x          Int.Call Ringing Cadence No : 1   x
x          Ext.Call Ringing Cadence No : 1   x
x          Executive Type Ringing Cadence No : 1 x
x          Priority Call Cadence No : 1      x

```

```

x          ISO Function + True          x ISO-QSIG
x          Booking B Channel + False    x
x      Uncontrol.Business Account Code + False    x
x      Business Pref.With Business No. + True     x
x          Project prefix With Code + False    x
x
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
Trunk Groups
The signaling variant must be ABC-F and NOT QSIG and the associated "remote network"
must have the protocol type "QSIG-GF" (see Network Routing Table below).
This is necessary for QSIG supplementary services like call diversion, call transfer
etc.
xxxxxxxxxx Consult/Modify: Trunk Groups xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
X          Node Number (reserved) : 1          x
X          Trunk Group Id : 8                  x
X
X          Trunk Group Type + T2              x
X          Trunk Group Name : QSIG PRA        x
X          Number Compatible With : -1        x
X          Remote Network : 8                 x for QSIG-GF
X          Shared Trunk Group + False        x
X          Special Services + Nothing        x
X          Node number : 1                   x
X          Transcom Trunk Group + False      x
X          Auto.reserv.by Attendant + False  x
X          Overflow trunk group No. : -1     x
X          Tone on seizure + False          x
X          Private Trunk Group + False      x
X          Q931 signal variant + ABC-F      x
X          Number Of Digits To Send : 5      x DDI length
X          Channel selection type + Quantum  x
X      auto.DTMF dialing on outgoing call + NO x
X          T2 Specificity + None            x
X          Public Network Category : 0       x
X          DDI transcoding + False          x
X          Can support UUS in SETUP + True   x
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
xxxxxxxxxx Consult/Modify: Trunk Group xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
x
x          Node Number (reserved) : 1          x
x          Trunk Group Id : 8                  x
x          Instance (reserved) : 1           x
x
x          Trunk Group Type + T2              x
x          Public Network Ref. : -----      x
x          VG for non-existent No. + YES     x
x          Entity Number : 0                 x
x          Supervised by Routing + NO        x
x          VPN Cost Limit for Incom.Calls : 0 x
x      Immediat Trk Listening For VPNCall + YES x
x          VPN TS % : 50                     x
x          Csta Monitored + NO               x
x          Max.% of trunks out CCD : 0       x
x          Ratio analog.to ISDN tax : ----- x
x          TS Distribution on Accesses + YES  x
x          Quality profile for voice on IP + Profile #1 x
x          IP compression type + Default     x
x          Use of volume in system + YES     x
x          Dialling end to end + No         x
x          DTMF end to end signal. + NO     x
x          Trunk group used in DISA + NO     x
x          DISA Secret Code : -----      x
x          Routing To Executive + NO        x
x          Trunk Category Id : 18           x

```

```

x          Nb of digits unused (ISDN) : 2                x prefix length
x          B Channel Choice + YES                    x B-chan. Excl.
x          Channels Reserved By Attend. : 0            x
x          Dissuasion For ACD + NO                   x
x          DTO joining + NO                           x
x          Enquiry Call On B Channel + NO             x
x          Automated Attendant + NO                   x
x          Calling party Rights category : 0           x
x          TS Overflow + YES                           x
x          Number To Be Added : -----              x
x          Charge Calling And ADN Creation : No        x
x          LogicalChannel : 1_30                      x QSIG chan.numb.
x          Use Split Acces : No                       x
x          Heterogeneous Remote Network + NO         x
x          Barring mode + Not barred                  x
x          ARS class of service : 31                  x
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
Translator (trunk prefix 08)
xxxxxxxxxx Consult/Modify: Prefix Plan xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
x
x          Node Number (reserved) : 1                 x
x          Instance (reserved) : 1                    x
x          Number : 08                                x
x
x          Prefix Meaning + Routing No.               x
x          Network Number : 8                         x
x          Node Number/ABC-F Trunk Group : 8          x
x          Number of Digits : 7                       x
x          Number With Sub Address (ISDN) + NO        x
x          Default X25 Id.pref. + NO                  x
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
Prefix for Path Replacement:
define a prefix as a local node number
for Path Replacement (e.g. 50400 as below)
xxxxxxxxxx Consult/Modify: Prefix Plan xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
x
x          Node Number (reserved) : 1                 x
x          Instance (reserved) : 1                    x
x          Number : 50400                             x
x
x          Prefix Meaning + Local Features            x
x          Local Features + Pabx address in DPNSS    x (*)
x
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
(*) With R5.0 this value is "PCX address in DPNSS"
Remote network settings
xxxxxxxxxx Consult/Modify: Network Routing Table xxxxxxxxxxxxxxxxxxxxxxxx
x
x          Node Number (reserved) : 1                 x
x          Instance (reserved) : 1                    x
x          Network Number : 8                         x
x
x          Rank of First Digit to be Sent : 3         x
x          Incoming identification prefix : -----   x
x          Protocol Type + QSIG-GF                    x
x          Numbering Plan Descriptor Id : 11          x
x          ARS Route list : 0                         x
x          Schedule number : -1                       x
x
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
trunk access
xxxxxxxxxx Consult/Modify: T2/T1/T0Access xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
x
x          Node Number (reserved) : 1                 x

```

```

x          Trunk Group Id : 8          x
x          Instance (reserved) : 1     x
x          Physical Address : 0-4-0    x
x                                         x
x          Access Type + T2           x
x          Access Cluster Id : -1      x
x          Time Slots T2 : 01111111111111110111111111111111 x
x                                         x
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
Digital access
xxxxxxxxxx Consult/Modify: Digital Access xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
x                                         x
x          Node Number (reserved) : 1  x
x          Shelf Address : 0           x
x          Board Address : 4           x
x          T0/T2 Access No. : 0        x
x                                         x
x          Access Type + T2           x
x          Synchronisation Priority : 255 x ClkMaster
x          Network Mode + YES         x
x          Max Nb Of Used B Channels : 30 x
x          Max_Nb_Of_Compressed_B_Channels : 0 x
x          TieLine Mode + YES         x
x          With Alarm + NO            x
x          Reserved1 + NO             x
x          Reserved2 + NO             x
x          Network Date Time Update + NO x
x          CRC4 + YES                 x
x                                         x
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

```

Siemens Hicom 300 R2.08/Hipath 4000 R1.0 QSIG Integration

This section describes the integration with Siemens Hicom 300 R2.08/Hipath 4000 R1.0 QSIG.

Test Report (Hicom 300)

Date	21.03.2003
Location	Vienna, Austria
Tested by	Norbert Bartalsky, Kofax
TCSP release	7.48.00
TCOSS module	7.48.00
PBX vendor	Siemens
PBX Type	HICOM 300
Protocols	QSIG (protocol variants ECMAV2 and PSS1V2)
PBX SW release(s)	2.08
Tested functions	BC, CD, CT, PR, MWI

TestRestrictions Problems Open Questions	<p>AOC was not tested, as not supported by TC QSIG Path Replacement after CT does not work if switchboard is involved in one of the two calls to be transferred</p> <p>This is a general Hicom 300 restriction</p> <p>The PBX "Hold music" did not work if the (primary) caller was calling from the digital comfort Optiset telephone and invoked the Call Transfer (the message "please wait/bitte warten" was shown on his display but silence until the second call was answered). This problem didn't occur with neither a/b nor standard digital Optiset telephones. This may be a problem with tested Hicom 300 SW release</p>
Summary	<p>Integration tests were successful</p> <p>Hicom 300 is validated to be used with KCS Server Model 305 using both BRI and PRI QSIG connections as well</p>

Test Report (Hipath 4000 R1.0)

Date	1.04.2004
Location	Vienna, Austria
Tested by	Norbert Bartalsky, Kofax
TCSP release	7.56.02
TCOSS module	7.56.02
QSIG Module	2.1
PBX vendor	Siemens
PBX Type	HIPATH4000
Protocols	QSIG (protocol variant ECMAV2)
PBX SW release(s)	1.0
Tested functions	BC, CD, CT, PR, MWI
TestRestrictions Problems Open Questions	<p>AOC was not tested, as not supported by TC QSIG Path Replacement after CT does not work if switchboard is involved in one of the two calls to be transferred</p> <p>This is a general Hicom 300/Hipath4000 restriction</p>
Summary	<p>Integration tests were successful</p> <p>Hicom 4000 is validated to be used with KCS Server Model 305 using both BRI and PRI QSIG connections as well</p>

Specific Considerations/Configuration Hints (Both Hicom 300/Hipath 4000)

1. Trunk Types

Siemens uses following abbreviations for trunks:

S0 – stands for the ISDN BRI point to point trunk

S2 - stands for the ISDN PRI point to point trunk

2. QSIG protocol variants

The PBX supports three QSIG variants – ECMAV1, ECMAV2 and PSS1V2, but only ECMAV2 was validated. The protocol variant is the trunk-related parameter.

However, the PSS1V2 should work, too.

ECMAV2 and PSS1V2 are compatible with KCS standard ISO-QSIG config (setup in the UIF config line 286, pos. 8).

3. Configuring Message Waiting Indication (MWI)

Unique „Message Centre ID“ parameter must be configured per each Voice Server in the HICOM 300 PBX (and must be also entered within the MWI On/Off events on the KCS side). In the HIPATH4000 PBX this parameter is optional, but recommended to be used anyway.

4. Call Hold & Call Transfer

The 1st (primary call) call of the two calls to be transferred must be put on Hold prior to the transfer with HICOM 300 PBX (UIF config line 295, pos. 6 set to 01). The Hold needn't be used with HIPATH4000, but it is recommended anyway in order to activate proper Hold on music in the PBX.

PBX Configuration (Both Hicom 300/Hipath 4000)

This section describes the PBX configuration for Hicom 300/Hipath 4000.

MWI Configuration

Configure a route for the Voicemail server:

```
ADD-RICT:MODE=PM,IDX=<n>,SAN=<MsgCentreID>,NAME="TOPCALL",STYPE=OTHER
```

<n> is the number of the VoiceMail server, 1, 2, 3, ...

<MsgCentreID> is the same parameter as used with KCS send order for MWI ON/OFF, it is recommended to use the KCS VoiceAccess number for it but incl. trunk prefix if defined in the PBX (for example, the Voice Access number is 999, the trunk prefix is 731, the MsgCentreID=731999).

Once MWI was activated using particular MsgCentreID it must be deactivated using the same MsgCentreID. Further, if the user presses the Phone Mail button on his telephone, the PBX may call (if configured for this) automatically the number given by the MsgCentreID (and this is the reason why the usage of KCS Voice Access number is recommended – user may automatically proceed to listen of his Voice Mails by pressing a single button).

In the following example 4 Voice Mail servers were configured for QSIG trunks with prefixes 731, 746, 747 and 79.

```
AB-RICT:PM;
H500: AMO RICHT GESTARTET
```

IDX	SAN	NAME
1	731999	TOPCALL
2	746999	TOPCALL 2
3	747999	TOPCALL 3
4	79699	

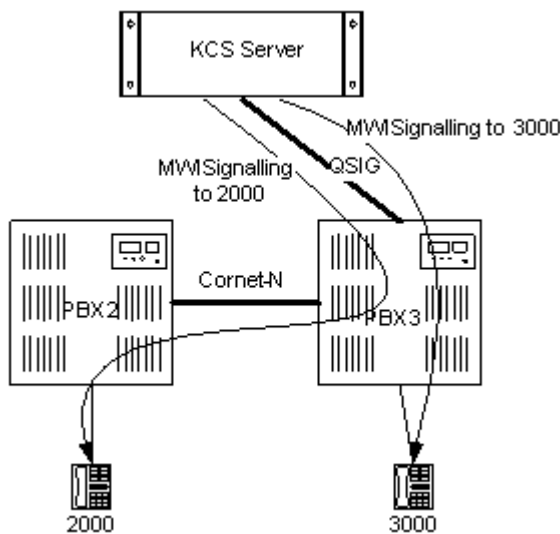
Note

- The SANs are dialable numbers that are really dialed when MWI is executed. So, there must be classic RICHT/LODR/LDAT/LDPLN set that leads to the tie-line connecting the KCS server and Hicom300/Hipath4000.
- If the KCS server should be integrated with Hipath4000, it must be taken into account that every Optiset/Optipoint must be explicitly assigned to the VoiceMail server. To do this, parameter PMIDX must correspond to IDX in AMO RICHT, type PM (see the example below).
- If the MWI functionality is desired also for cordless phones called CMI, following patches must be applied:
 - For Hipath4000 1.0: MSC08733 and MSC09242 (for PMIDX)
 - For Hicom 300: no patches needed (as there is no PMIDX)

MWI Configuration Example (for the Hipath4000 Network)

Assume a network of two HIPATH4000 nodes PBX2 and PBX3. The KCS server is connected directly with the PBX3 node via S2m, while PBX 2 and PBX 3 are interconnected through Siemens proprietary Cornet-N protocol.

The KCS trunk prefix is 70, the KCS Voice access number 4000 (so the KCS Voice access number may be reached by dialing 704000 from both extensions 2000 and 3000 as well). The MessageCentreID is 704000. With this configuration, KCS server is able to control MWI indicators on both extension 2000 and 3000:



Example for PBX3 which is directly connected to the KCS server:

```
<reg-tdcsu:1-2-25-1;
REG-TDCSU:1-2-25-1;
H500: AMO TDCSU STARTED
ADD-TDCSU:NEW ,1-02-025-1,150,77,0,0,77,1,1,"      ",0
,ECMAV2,1,,NONE,,,,GDTR,N,TIE,NONE,N,0,
,00,0,,,
,31,MANY,400,0,1,1,EMPTY,150,5,N,
```

```

,,,,,16,8,1,10,,EC&G711&G729OPT
,"",40,CIR,Y,S2CONN,
1&&30
,N,1,9,0,0,0,0,0
;
AMO-TDCSU-111      DIGITAL TRUNKS
REGENERATE COMPLETED;
<dis-tdcsu:1-2-25-1;
DIS-TDCSU:1-2-25-1;
H500: AMO TDCSU STARTED
+----- DIGITAL TRUNK (FORMAT=L) -----+
| DEV      = S2CONN      PEN      = 1-02-025-1  TGRP      = 40      |
+-----+-----+-----+-----+-----+-----+
| PROTVAR  = ECMAV2      INS       = N          SRCHMODE  = CIR      |
| COTNO    = 150         COPNO    = 77         DPLN      = 0        |
| ITR      = 0          COS       = 77         LCOSV     = 1        |
| LCOSD    = 1          CCT       =           DESTNO   = 0        |
| SEGMENT  = 1          DEDSCC   =           DEDSVC   = NONE     |
| FACILITY =           DITIDX   =           SRTIDX   =         |
| TRTBL    = GDTR       SIDANI   = N          ATNTYP   = TIE     |
| CBMATTR  = NONE      NWMUXTIM = 10        TCHARG   = N        |
| SUPPRESS = 0          DGTPR   =           CHIMAP   = N        |
| ISDNIP   = 00        ISDNNP   = 0          PNPAC    =         |
| PNPL2P   =           PNPL1P   =           NNO      = 400     |
| TRACOUNT = 31        SATCOUNT = MANY      CARRIER  = 1        |
| ALARMNO  = 0          FIDX     = 1          FWDX     = 5        |
| ZONE     = EMPTY     COTX    = 150        TPROFNO  =         |
| DOMTYPE  =           DOMAINNO =           CCHDL   =         |
| INIGHT   =           UUSCCY   = 8          FNIDX    = 1        |
| UUSCCX   = 16        & G711   & G729OPT   SRCGRP   =         |
| CLASSMRK = EC                                     TCCID    =         |
+-----+-----+-----+-----+-----+-----+
| BCNEG    = N          BCGR     = 1          LWPAR    = 9        |
| LWPP     = 0          LWLT    = 0          LWPS     = 0        |
| LWR1     = 0          LWR2    = 0                                     |
| SVCDOM   =                                     |
| BCHAN    = 1 && 30                                     |
+-----+-----+-----+-----+-----+-----+
AMOUNT OF B-CHANNELS IN THIS DISPLAY-OUTPUT: 30
AMO-TDCSU-111      DIGITAL TRUNKS
DISPLAY COMPLETED;
<dis-cot:150;
DIS-COT:150;
H500: AMO COT STARTED
COT: 150 INFO:
DEVICE: INDEP      SOURCE: DB
PARAMETER:
RECALL IF USER HANGS UP IN CONSULTATION CALL      RCL
TRUNK SIGNALING ANSWER                             ANS
KNOCKING OVERRIDE POSSIBLE                         KNOR
CALL EXTEND FOR BUSY, RING OR CALL STATE           CEBC
NETWORKWIDE CALL FORWARDING PERMITTED              FWDN
NETWORKWIDE FORWARDING NO-ANSWER                   FNAN
DON'T RELEASE CALL TO BUSY HUNT GROUP              BSHT
END-OF-DIAL FOR BLOCK IS SET                       BLOC
SEND NO NODE NUMBER TO PARTNER                     LWNC
ACTIVATE TRANSIT COUNTER ADMINISTRATION FOR S0/S2 LINE ATRS
CONNECTION TO ROUTE OPTIMIZATION NODE              ROPT
INCOMING CIRCUIT FROM SYSTEM WITHOUT LCR           NLCR
TSC-SIGNALING FOR NETWORKWIDE FEATURES (MANDATORY) TSCS
USE DEFAULT NODE NUMBER OF LINE                    DFNN
INCOMING CIRCUIT FROM SYSTEM WITHOUT LCR (DATA)    NLRD

```

```

CONTROLLED TRUNK AND LINE SELECTION
RESERVED ELEMENT
NO TONE
AMO-COT -111 CLASS OF TRUNK FOR CALL PROCESSING
DISPLAY COMPLETED;
<dis-cop:77;
DIS-COP:77;
H500: AMO COP STARTED
COP: 77 INFO:
DEVICE: INDEP SOURCE: DB
PARAMETER:
CO TRUNK ACCESS:
TRUNK ACCESS TA
TOLL ACCESS:
TRUNK ACCESS TA
AMO-COP -111 CLASS OF PARAMETER FOR DEVICE HANDLER
DISPLAY COMPLETED;
<dis-cossu:cos,77;
DIS-COSSU: COS,77;
H500: AMO COSSU STARTED
+-----+-----+-----+-----+
| COS | VOICE | FAX | DTE |
+-----+-----+-----+-----+
| 77 |> | | |
| | TA | TA | TA |
| | TNOTCR | TNOTCR | TNOTCR |
| | | BASIC | BASIC |
+-----+-----+-----+-----+
AMO-COSSU-111 CLASSES OF SERVICE
DISPLAY COMPLETED;
<

```

Every extension (for Hipath4000 only) being served by the KCS server must have MB in its COS and MB button configured:

```

CHA-SBCTU:STNO=<...>,PMIDX=1; /* FOR HIPATH-4000 ONLY */
ADD-RICHT:PM,1,,704000, "TOPCALL",OTHER;
ADD-RICHT:LRTENEW,70,ALL,"TOPCALL", 40,400,YES,,FIX,DIGITS,"DTMF:",PP300;
ADD-LODR:70,,,NPI,UNKNOWN ,UNKNOWN ;
ADD-LODR:70,,,ECHO,2;
ADD-LODR:70,,,END;
ADD-LDAT:70,ALL,1,,40,70,1;
ADD-WABE:70,,,TIE;
ADD-LDPLN:70-XXXX,,70,,1,,,N;

```

Example for PBX2 which is not directly connected to the KCS server:

Every extension being served by the server must have MB in its COS and MB button configured.

```

CHA-SBCTU:STNO=<...>,PMIDX=1; /* FOR HIPATH-4000 ONLY */
ADD-RICHT:PM,1,,704000, "TOPCALL",OTHER;
ADD-RICHT:LRTENEW,70,ALL,"TOPCALL", 30,400,YES,,FIX,DIGITS,"DTMF:",PP300;
ADD-LODR:70,,,NPI,UNKNOWN ,UNKNOWN ;
ADD-LODR:70,,,ECHO,1;
ADD-LODR:70,,,ECHO,2;
ADD-LODR:70,,,END;
ADD-LDAT:70,ALL,1,,30,70,1;
ADD-WABE:70,,,TIE;
ADD-LDPLN:70-XXXX,,70,,1,,,N;

```

Call Transfer and Path Replacement (Route Optimization)

Call Transfer needs the COT parameter CEBC (UELM in German installations).

Activate the Path Replacement (route-optimization):

```
AMO ZAND: branch ALLDATA, NODECD=<nodeNr>
AMO WABE: <nodeNr>, .. EIGENKZ
AMO RICHT: ROUTOPT=YES
AMO TDCSU: <cotNr>: AMO COT: ROPT
AMO ZAND: branch ALLDATA, ROUTOPTD=N, ROUTOPTP=N
```

<nodeNr> is the own NodeCD number, e.g. 3020

<cotNr> is the COT number of the QSIG trunk

The own nodeCD number is a prerequisite for the PBX to perform the Path Replacement after the Call Transfer.

Example of configuration with own node number "3020":

```
ABFRAGEN-ZAND:DATENALL;
H500: AMO ZAND GESTARTET
ALLGEMEINE SYSTEM-DATEN:
=====
UMLEGEN = UEBERG , HINWEIS = NEIN,
BERERH = FBKW
FREITON = NEIN, UMLVERH = NEIN, ENACHT = NEIN,
NACHTBER = FBKW
VBZAUL = NEIN, HALTETON = MUSIK ,
ANATESIG = TON , DRPANZ = 10, AWTON = JA ,
KONFAMT = JA , RWSAMT = NEIN, DATANZFO = TTMM,
LANDKZ = 1 , WANRBEG = NEIN, MELODIE = 1,
FANGKZ = , CPBLOWL = 80 , CPBUPPL = 100,
DURCHZL = NEIN, PREDIA = JA , SIUSPKZ = 1,
AMTRUF = NEIN, COEXN = 0 , ANZRR = 5 ,
SEVDIG = NEIN, KNNR = 1 ,
DISPMODE = MODEL, KNOTENKZ = 3020 ,
ROUTOPTE = NEIN, ROUTOPTS = NEIN, CALLOFF = NEIN,
PARARUF = NEIN,
DRZIELP = JA , ONEPARTY = NEIN, MELDVER = NEIN,
RWSAMTB = NEIN, VAMTAMT = JA , WAKOZIVO = NEIN,
ANSAMT = NEIN, ROEDEAKT = NEIN, WAMAKELN = NEIN,
AULPRUEF = NEIN, HTONSAAO = NEIN, NAWAVERZ = NEIN,
VERMANKL = NEIN, AUFSMZST = JA , AUFSSA = NEIN,
AKNASTAS = JA , WAUEBSAO = NEIN, GESPNAUF = NEIN;
AMO-ZAND -222 ZENTRALE ANLAGENDATEN
ABFRAGEN DURCHGEFUEHRT;
<
AB-WABE:ALLG,3020;
H500: AMO WABE GESTARTET
```

WAHLBEWERTUNG		GUELTIG FUER ALLE WABE-GRUPPEN			
RUFNUMMER	VERKEHRSSITUATION	KENNZAHL	VORLEIST/RUFUM	DNI/ZUSATZINFO	
	1 1111 1112 22	PUNKT	*=EIGENER KNOTEN		
3020	. .**** ***** **... ..	EIGENKZ			

```
AMO-WABE -222 WAHLBEWERTUNG
```

```
ABFRAGEN DURCHGEFUEHRT;
<
```

Note With some installations a problem may occur while transferring calls from KCS Server to the PSTN (e.g. someone uses TC/Dialer and lets his local extension be transferred to a mobile number). In such a case the Hicom300/Hipath4000 informs the public network on the activated call transfer, but it may occasionally happen that this communication between Hicom300/Hipath4000 and CO (central office) does not work properly and as a consequence, the calls towards KCS are disconnected (a facility message with an empty facility information element is sent to KCS and this leads to protocol error and disconnection).

If such a situation following patches may be helpful:

- For Hipath4000 1.0: MSC07365
- For Hicom300 3.0: MSC03893

(The Siemens technician should verify the exact patch number necessary for the particular release).

Call Diversion Configuration

The “Rerouting” network routing algorithm should be configured for the QSIG trunk for all three types of call diversions (CFU, CFB and CFNR) by setting following two trunk (“COT”) parameters:

- AULN and RWSN (for German configurations)
- FWDN and FNAN (for English configurations)

S0 Access (BRI) and S2 Access (PRI) Configuration

The configuration for both trunk types (S0-BRI and S2-PRI) is almost the same: the only difference is the parameter:

- GERAETETYP=S0VERB (for S0)
- GERAETETYP=S2VERB (for S2)

COT Parameters:

- PROTVAR=ECMAV2,SEGMENT=1

In the following example the S0 (BRI) trunk with the prefix 731 is configured for Call Transfer and Route Optimization (the Path Replacement has been activated):

```
AB-LDPLN:RNR,731;
H500: AMO LDPLN GESTARTET
+-----+
| RNR 731          ---> |
+-----+
| LWMNR | LWM      |
+-----+
| 276 | 731-X     |
+-----+
AMO-LDPLN-222      EINRICHTEN WAEHLMUSTERPLAN FUER LCR
ABFRAGEN DURCHGEFUEHRT;
<
AB-LDPLN:LWM,276;
H500: AMO LDPLN GESTARTET
+-----+
| LWMNR : 276 | LWM : 731-X |
+-----+
```

```

| | IPS : 22 |
+-----+-----+-----+-----+-----+-----+
| | WABE | LRTG | LBER | | WABE | LRTG | LBER |
+-----+-----+-----+-----+-----+-----+
| | 0 | 15 | 1 | | 8 | 15 | 1 |
| | 1 | 15 | 1 | | 9 | 15 | 1 |
| | 2 | 15 | 1 | | 10 | 15 | 1 |
| | 3 | 15 | 1 | | 11 | 15 | 1 |
| | 4 | 15 | 1 | | 12 | 15 | 1 |
| | 5 | 15 | 1 | | 13 | 15 | 1 |
| | 6 | 15 | 1 | | 14 | 15 | 1 |
| | 7 | 15 | 1 | | 15 | 15 | 1 |
+-----+-----+-----+-----+-----+-----+
AMO-LDPLN-222 EINRICHTEN WAEHLMUSTERPLAN FUER LCR
ABFRAGEN DURCHGEFUEHRT;
<
TYP =
LRTG =
LDIENST =
AB-LDAT:,15,;
H500: AMO LDAT GESTARTET
+-----+-----+-----+-----+-----+-----+
| LRTG = 15 LDPLN NAME = S0-VERB KZ 731 DIENST = ALLE |
| TYP = LCR ZKNNR-RICHTUNG = 105 |
+-----+-----+-----+-----+-----+-----+
| | | | | ZEITBAND | CARRIER | BAND |
|LRTGEL | LWERT | BUNUM | LWR |LBER | ABCDEFGH | ZONE | BR | LATTR |
+-----+-----+-----+-----+-----+-----+
| 1 | 1 | 15 | 2 | 1 | ***** | 1 | LEER | 1 | GEBAKT |
+-----+-----+-----+-----+-----+-----+
AMO-LDAT -222 LCR-RICHTUNGEN
ABFRAGEN DURCHGEFUEHRT;
<
ART =
LRTG =
LDIENST =
AB-RICHT:LRTG,15,;
H500: AMO RICHT GESTARTET
+-----+-----+-----+-----+-----+-----+
| LRTG = 15 NAME = S0-VERB KZ 731 DIENST = ALLE |
| ZKNNR = 105 |
| ROUTOPT = JA REROUT = NEIN VLVER = NEIN UMLVER = NEIN |
| MFV: UMS=FIX ANZ=OHNE TEXT= PULS=PP300 |
| RTG NR = 12 BUGS = LIN MAINGROUP = 12 |
+-----+-----+-----+-----+-----+-----+
| BUNUM = 15 LDAT S0 - QUER KZ 731 SUBGROUP = 16 |
+-----+-----+-----+-----+-----+-----+
AMO-RICHT-222 RICHTUNG
ABFRAGEN DURCHGEFUEHRT;
<
LAGE1 =
AB-TDCSU:1-1-61-1;
H500: AMO TDCSU GESTARTET
+-----+-----+-----+-----+-----+-----+
| GER = SOVERB LAGE = 1-01-061-1 |
+-----+-----+-----+-----+-----+-----+
| COTNR = 120 COPNR = 130 WABE = 0 |
| VBZ = 15 COS = 42 LCOSS = 7 |
| LCOSD = 7 SATZNR = ZLNR = 0 |
| PROTVAR = ECMAV2 SEGMENT = 1 TCHARG = N |
| ANZUNT = 0 ZIVO = CHIMAP = N |
| ISDNCC = ISDNAC = ISDNLC = |
| ISDNIP = ISDNNP = |
| PNPL2C = PNPL1C = PNPLC = |
+-----+-----+-----+-----+-----+-----+

```



```

| PNPL2P = PNPL1P =
| TRACOUNT = 31 SATCOUNT = VIELE KNNR = 105
| ALARMNR = 0 FIDX = 1 CARRIER = 1
| ZONE = LEER COTX = 121 AULX = 5
| DOMTYP = DOMAINNR = TPROFNR =
| ENACHT =
+-----+
| INBETR = J BUNR = 15 SUCHART = ZYK
| MASTER = J SMD = J CNTRNR = 0
| BKVER = N
+-----+
ANZAHL DER B-KANAELE IN DIESER AUSGABE: 2
AMO-TDCSU-222 DIGITALE SAETZE
ABFRAGEN DURCHGEFUEHRT;
<
AB-LODR:2;
H500: AMO LODR GESTARTET
+-----+
| LWR LWRELPOS LWREL PARAMETER |
+-----+
| 2 | 1 ECHOFELD 2 |
| | 2 ENDE |
+-----+
H03: DIE NAECHSTE FREIE LWR IST 6
AMO-LODR -222 ADMINISTRATION VON LCR-WAHLREGELN
ABFRAGEN DURCHGEFUEHRT;
<
AB-BUEND:15;
H500: AMO BUEND GESTARTET
+-----+
| BUENDELNUMMER : 15 BUENDELNAME: S0 - QUER KZ 731 MAX-ANZAHL: 2 |
| UNTERGR.NUMMER: 16 GERAETETYP : S0VERB ANZFANG : 0 |
| RESERVIERT : N SUCHART : ZYKLISCH ANZACD : * |
| MINDESTENS EINER RICHTUNG ZUGEORDNET |
| FOLGENDE SATZLAGEN (LTG-LTU-BAUGRUPPE-SATZNUMMER) SIND ZUGEORDNET: |
+-----+
| 1- 1- 61-1 B-CHL: 1 | 1- 1- 61-1 B-CHL: 2 | : |
+-----+
AMO-BUEND-222 BUENDEL
ABFRAGEN DURCHGEFUEHRT;
<
AB-COT:120;
H500: AMO COT GESTARTET
COT: 120
PARAMETER:
ANRUF BEI EINHAENGEN IN RUECKFRAGE AERF
UMLEITEN AMTSGESPRAECH UASE
MELDEN VON DER LEITUNG MVLIT
UEBERGABE IM BESETZT-, RUF- ODER GESPRAECHSZUSTAND UELM
QUERLEITUNG QUER
ANRUFUMLEITUNG NETZWEIT ERLAUBT AULN
RUFWEITERSCHALTUNG NETZWEIT ERLAUBT RWSN
AMTSWAEHLTONEINSPEISUNG BEI GEHENDEN AMTSBELEGUNGEN AWTE
LEITUNG OHNE KNOTENNUMMER LOKN
LEITUNG FUEHRT ZU KNOTEN MIT ROUTE OPTIMIERUNG ROPT
KOMMENDE LEITUNG VON ANLAGE OHNE LCR OLCR
TSC-SIGNALISIERUNG DER EXTERNEN BRIEFKASTENMELDUNGEN TSCS
LEITUNG SENDET BETRAEUGE AN URSPRUNGSKNOTEN LTMB
VOREINGESTELLE KNOTENNUMMER DER LEITUNG VERWENDEN VKNN
KOMMENDE LEITUNG VON ANLAGE OHNE LCR (DATEN) OLRD
KEIN TON KTON
AMO-COT -222 CLASS OF TRUNK
ABFRAGEN DURCHGEFUEHRT;
<

```

DTMF Generation on Optiset/Optipoint Sets

It is typically not possible to generate DTMF tones after the Optiset/Optipoint has been called from the KCS Server, e.g. by TC/Dialer (in other words, Optiset/Optipoint has received an incoming call).

DTMF generation may be enabled by the following command for such cases:

```
DIS-WABE:GEN,,,,DTMFCONV;
*# .....DTMFCONV
```

Now after the user has answered an incoming call on his Optiset/Optipoint set, he may press *# to enable generating of DTMF for this call.

In order to enable generating DTMF tones for each incoming call without typing any enabling sequence like *#, the installation of a specific Hicom/Hipath patch may be necessary.

Note This problem does not occur if Optiset/Optipoint originates the call.

Nortel Meridian 1 R25.40b QSIG Integration

This section describes the integration with Nortel Meridian 1 R25.40b QSIG.

Test Report

Date	04.06.2003
Location	Vienna, Austria
Tested by	Norbert Bartalsky, Kofax
TCSP release	7.50.00
TCOSS module	7.50.00
PBX vendor	Nortel
PBX Type	Meridian 1 (Option 11C)
Protocols	ETSI-QSIG and ISO-QSIG
PBX SW release(s)	25.40b, with patch p16326B1 (this patch was only necessary for CT+PR functionality for the BRI access)
Tested functions	BC, MWI, CD, CT, PR

<p>TestRestrictions Problems Open Questions</p>	<p>AOC was not tested, as not supported by TC QSIG Path Replacement after CT does not work if switchboard is involved in one of the two calls to be transferred</p> <p>This is a general Meridian 1 restriction</p> <p>During the Call Transfer the primary call could not be put on HOLD therefore the CT without HOLD must be used for this PBX</p> <p>Meridian 1 performs the Path Replacement as late as about 7-8 seconds after successful Call Transfer by join In order to shorten this time, following patches may be applied on the Meridian side: P18933_1 and P18812_1</p> <p>Succession 3.0 problem here was a problem that MWI was not working using Meridian's successor "Succession 3.0", applying the patch nr. 18305 solved the problem</p>
<p>Summary</p>	<p>Integration tests were successful</p> <p>Meridian 1 is validated to be used with KCS Server Model 305 using both BRI and PRI QSIG connections as well</p> <p>Succession 3.0 was not validated, but it is known that it works with the same configuration as described here for Meridian 1 assuming the patch 18305 has been applied</p>

Specific Considerations/Configuration Hints

1. Trunk Types

Abbreviations BRI and PRI are used for basic and primary rate trunk

2. QSIG protocol variants

Meridian 1 supports two QSIG protocol variants – ISO and ETSI – that are not compatible with each other. The protocol variant is the trunk-related parameter.

Both ISO-QSIG variant (Meridian parameter IFC=ISGF) and ETSI-QSIG (Meridian parameter IFC=ESGF) are compatible with KCS ISO-QSIG and ETSI-QSIG configurations (setup in the UIF config line 286, pos. 8)

It is recommended to use the ISO-QSIG protocol variant on both sides (default QSIG configuration on KCS side).

Note that Meridian 1 differs between QSIG-BC ("basic call") and QSIG-GF ("generic functional protocol"). For a KCS Voice integration QSIG-GF is necessary.

3. Configuring Message Waiting Indication (MWI)

No „Message Centre ID“ parameter needs to be setup in the PBX, it is recommended to generate MWI orders on KCS side with empty „Message Centre ID“ parameter.

4. Call Hold & Call Transfer

Meridian 1 supports Call Transfer by join "into ringing", but 1st (primary call) call of the two calls to be transferred must not be put on Hold prior to the transfer as Meridian does not support remote Hold notification (UIF config line 295, pos. 5 set to 01 and pos. 6 set to 00).

5. Network algorithm "Rerouting" for Call diversions not supported

Meridian 1 supports only the "Forward Switching" algorithm to perform call diversions via QSIG trunk (in the case KCS places an outgoing call to a Meridian 1 extension that is being forwarded to other extension, Meridian 1 establishes at first the 2nd call and then joins both calls together. On the other

hand, with “Rerouteing” Meridian 1 would only instruct KCS to disconnect the call to the 1st extension and establish the 2nd call to the other).

The only drawback resulting from this limitation is that KCS would not be able to optimize loops during complex Call Transfer & Call Diversion scenarios.

For example, the caller would be transferred by the TC/Attendant function to an extension that is forwarded to the KCS server again – such a call would occupy 3 lines. But if the PBX would support Rerouteing method, KCS would switch the caller to the desired mailbox internally while occupying only one line).

6. Meridian 1 “Options” and relevant SW releases for QSIG

There are several possible “options” of Meridian 1 PBX – like 11C, 51C, 61C and 81C.

The Meridian 1 “option” only characterizes particular hardware and line capacity (number of processors, lines etc.) but has no impact on specific features as the software releases are the same for all options.

In the following see the approximate QSIG development through different Meridian 1 releases:

- Rel 22.xx – QSIG-BC implemented
- Rel 23.47 – QSIG-GF, Call Diversions (“redirecting number”), Path Replacement
- Rel 24.25 – Call Transfer
- Rel 25.40 - MWI

PBX Configuration

This section describes the PBX configuration.

BRI Access Route

```

BRI Route:
LD:16
TYPE RDB
CUST 00
DMOD
ROUT 11          * route number, to be defined by PBX admin
DES ISO_QSIG    * only description
TKTP TIE
NPID_TBL_NUM    0
ESN NO
RPA NO
CNVT NO
SAT NO
RCLS EXT
DTRK YES
DGTP BRI        * basic rate access
IFC ISGF        * ISO QSIG-GF (ESGF would indicate ETSI-QSIG-GF, but not recommended)
CLID OPT0
SIDE NET        * Meridian is the Master (Network side)
CNEG NO
OVLN YES        * Overlap receiving, can be also NO
DIDD 0
OVLN YES        * Overlap sending, can be also NO
OVLN 0
MBGA NO
PGPN 1
                * remote capabilities PRI-Path replacement, DV3I-Call Diversions,
                * CTI-Call Transfer, QMWI-Message waiting; the trailing "I" stands
for

```

```

"ObjectID"          * "Integer" coding (on the other hand, trailing "0" would indicate
                    * coding - e.g. QMWO - but don't use it !)
RCAP COLP NDI CCBI CCNI PRI DV3I CTI QMWI
PR_TRIGS DIV 15 1 * Path Replacement triggers
                  CNG 15 1
                  CON 15 1
                  CTR 15 1 * Call Transfer trigger (15 attempts in 1 min. intervals)
                        * note that patch p16326B1 has to be used for this trigger
                        * to work properly via BRI !
PR_RTN NO
ISDN YES
  MODE PRA          * confusing, but this parameter was really set to PRA for BRI trunk ...
  PNI 00000
  NCNA NO
  NCRD NO
  CHTY BCH
  INAC NO
  CPFXS YES
  DAPC NO
  INTC NO
DSEL VOD
PTYP DTT
AUTO NO
DNIS NO
DCDR NO
ICOG IAO
SRCH LIN
TRMB YES
STEP
ACOD 8811
TCPP NO
TARG
BILN NO
OABS
INST
IDC NO
DCNO 0 *
NDNO 0
DEXT NO
SIGO STD
STYP SDAT
MFC NO
ICIS YES
OGIS YES
TIMR ICF 512
      OGF 512
      EOD 13952
      DSI 34944
      NRD 10112
      DDL 70
      ODT 4096
      RGV 640
      GTO 896
      GTI 896
      SFB 3
      IENB 5
      TFD 0
      VSS 0
      VGD 6
SST 5 0
DTD NO
SCDT NO
2 DT NO
```

```
NEDC ETH
FEDC ETH
CPDC NO
DLTN NO
HOLD 02 02 40
SEIZ 02 02
SVFL 02 02
DRNG NO
CDR NO
NATL YES
SSL
CFWR NO
IDOP NO
VRAT NO
MUS NO
PANS YES
MANO NO
FRL 0 0
FRL 1 0
FRL 2 0
FRL 3 0
FRL 4 0
FRL 5 0
FRL 6 0
FRL 7 0
OHQ NO
OHQT 00
CBQ NO
AUTH NO
TTBL 0
ATAN NO
OHTD NO
PLEV 2
OPR NO
ALRM NO
ART 0
PECL NO
DCTI 0
TIDY 8811 11
SGRP 0
AACR NO
LD:27
TN 4 0 0 3
APPL BRIE
  ISDN_MCNT 300
CUST 0
CTYP SILC
MISP 3
MODE NT
TKTP TIE
CLOK NO
PDCA 2
ROUT 11      * route number
T302 15
T310 120
B1
  MEMB 1
  TGAR 0
  NCOS 0
  CLS UNR APN
B2
  MEMB 2
  TGAR 0
  NCOS 0
```

```
CLS UNR APN
DATE 3 JUN 2003
```

PRI Access Route

```
PRI Route:
LD:16
TYPE RDB
CUST 00
DMOD
ROUT 10      * route number, to be defined by PBX admin
DES
TKTP TIE
NPID_TBL_NUM 0
ESN NO
RPA NO
CNVT NO
SAT NO
RCLS EXT
DTRK YES
BRIP NO
DGTP PRI2   * PRI2- E1 PRI, PRI - T1 PRI access
ISDN YES
  MODE PRA
  IFC ISGF   * ISO QSIG-GF (ESGF for ETSI-QSIG-GF, but not recommended for KCS !)
  SBN NO
  PNI 00000
  NCNA NO
  NCRD NO
  CTYP UKWN
  INAC NO
  ISAR NO
  CPFXS YES
  DAPC NO
  INTC NO
DSEL VOD
PTYT DTT
AUTO NO
DNIS NO
DCDR NO
ICOG IAO
SRCH LIN
TRMB YES
STEP
ACOD 8810
TCPP NO
TARG
BILN NO
OABS
INST
IDC NO
DCNO 0 *
NDNO 0
DEXT NO
SIGO STD
MFC NO
ICIS YES
OGIS YES
TIMR ICF 512
      OGF 512
      EOD 13952
      NRD 10112
      DDL 70
```

```

ODT 4096
RGV 640
GTO 896
GTI 896
SFB 3
NBS 2048
NBL 4096
IENB 5
TFD 0
VSS 0
VGD 6
DTD NO
SCDT NO
2 DT NO
DRNG NO
CDR NO
NATL YES
SSL
CFWR NO
IDOP NO
VRAT NO
MUS NO
PANS YES
FRL 0 0
FRL 1 0
FRL 2 0
FRL 3 0
FRL 4 0
FRL 5 0
FRL 6 0
FRL 7 0
OHQ NO
OHQT 00
CBQ NO
AUTH NO
TTBL 0
ATAN NO
PLEV 2
OPR NO
ALRM NO
ART 0
PECL NO
DCTI 0
TIDY 8810 10
SGRP 0
AACR NO
LD:14
DES ISGF
TN 002 01
TYPE TIE
CDEN SD
CUST 0
TRK PRI2
PDCA 2
PCML A * A- A-law encoding, MU-u-law encoding
NCOS 0
RTMB 10 1 * route number and member number
B-CHANNEL SIGNALING
TGAR 0
AST NO
IAPG 0
CLS UNR DIP CND WTA LPR APN THFD XREP BARD
P10 VNL
PRI : DCH

```



```

LD:17
ADAN      DCH 10
CTYP      MSDL
CARD      02
PORT      1
DES       iso_qsig      * only description
USR       PRI
DCHL      2
OTBF      127
PARM      RS422  DTE
DRAT      64KC
CLOK      EXT
IFC       ISGF      * ISO QSIG-GF (ESGF for ETSI-QSIG-GF, but not recommended for KCS !)
          PINX_CUST 0
          ISDN_MCNT 300
CLID      OPT0
CO_TYPE   STD
SIDE      NET      * Meridian is the Master (Network side)
CNEG      1
RLS       ID      **
QCHID     NO      * Logical B-channel numbering used (B1..B30), YES would indicate using of
                  * QSIG non-conform timeslot numb. (1..15, 17..31), not recommended for
KCS !)
          * This parameter is relevant only for E1 PRI, not for T1 PRI !
RCAP      COLP  NDI  CCBI  CCNI  PRI  DV3I  CTI  QMWI  *remote capabilities - see BRI
configuration
PR_TRIGS  DIV 15 1      * Path Replacement triggers
          CNG 15 1
          CON 15 1
          CTR2 15 1      * Call Transfer trigger (15 attempts in 1 min. intervals)
PR RTN    NO
MBGA      NO
OVLN      YES
DIDD      0
OVLN      YES
OVLN      0
T310      120
T200      3
T203      10
N200      3
N201      260
K         7

```

Special Considerations for Path Replacement

Path Replacement (route-optimization) after Call Transfer is configured in corresponding BRI or PRI route (see Path replacement triggers).

But there is still “own node number” (PINX_DN parameter) in the customer data that identifies own node in the PBX network and that must be set to any valid value so that Meridian would initiate Path Replacement at all.

```

LD 15:
TYPE      NET_DATA
CUST      00
OPT RTD
AC2
FNP       YES
ISDN      YES
          PNI 2222
          PINX_DN 8800      * Meridian PINX number
          MBG 0

```

```
BSGC 65535
PFX1
PFX2
HLOC
LSC
RCNT 5
PSTN NO
TNDM 15
PCMC 15
SATD 1
OCLI NO
TIDM NO
DASC
ROPT NRO      * this is only for DPNSS, irrelevant for QSIG
DITI YES
TRNX YES
EXTT YES
FTOP FRES
APAD 0 0
VNR NO
NIT 8
NAS ATCL NO
NAS ACTV NO
FOPT 2
CNDN
CNAT
CNIP YES
DMWM NO
MWNS NO
```

Special Considerations for Message Waiting and Call Diversions

1. There is no need to setup any “Message CentreID” parameter for the MWI function, it is not supported by Meridian PBX. Send orders on KCS for MWI should have the “Message CentreID” parameter empty (even though it seems to work with any “Message CentreID” parameter).
2. It is necessary to enable MWI indication on the telephone set.
3. It is possible to program the Voice Mail button on the telephone to reach the Voice Server after the MWI lamp has been switched on.
4. It is necessary to enable different call forward types on the telephone set.

See an example of the Meridian 1 setup for an extension “1002” with MWI and call forwards (CFU, CFB and CFNR) enabled:

```
LD:15
DES TEST
TN 005 0 00 03
TYPE 2616
CDEN 8D
CUST 0
AOM 0
FDN 006645045929 * The destination for CFNR
TGAR 0
LDN NO
NCOS 0
SGRP 0
RNPG 1
SCI 0
SSU
LNRS 16
```

```

XLST 2
SCPW
SFLT NO
CAC_MFC 0
      * MWA-enable MWI, FNA-enable CFNR, HTA-enable CFB, CFXA-enable CFU to ext.
number
CLS  UNR FBA WTA LPR PUA MTD FNA HTA ADD HFD
      MWA LMPN RMMD SMWD AAD IMD XHD IRD NID OLD VCE DRG1
      POD DSX VMD CMSD SLKD CCSD SWD LNA CNDA
      CFTD SFA MRD DDV CNID CDCA MSID DAPA BFED RCBD
      ICDD CDMD MCTD CLBD AUTU
      GPUD DPUD DNDA CFXA ARHD CLTD ASCD
      CPFA CPTA ABDD DELD CFHD FICD NAID BUZZ AGRD MOAD
      UDI RCC HBTD AHD IPND DDGA NAMA MIND PRSD NRWD NRCD NROD
      DRDD EXR0
      USRD ULAD RTDD RBDD RBHD PGND OCBD FLXD FTTC DNDY DNO3 MCBN
      FDSO NOVD
CPND_LANG ENG
RCO 0
HUNT 006645045929 * The destination for CFB
LHK 0
PLEV 02
AST
IAPG 0
AACS NO
ITNA NO
DGRP
MLWU_LANG 0
DNDR 0
KEY 00 SCR 1002 0      MARP
      CPND
      CPND_LANG ROMAN
      NAME Nebenstelle 1002
      XPLN 27
      DISPLAY_FMT FIRST, LAST
01 TRN
02 AO6
03 CFW 16 92999 * The destination for CFU
04 RGA
05
06 MWK 91999 * Voice Server access number
07
08 EOVR
09
10
11
12
13
14
15
DATE 4 JUN 2003

```

Philips Sopho IS3000 R6810.32E QSIG Integration

This section describes the integration with Philips Sopho IS3000 R6810.32E QSIG.

Test Report

Date	11.02.2004
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Location	Vienna, Austria
Tested by	Norbert Bartalsky, Kofax
TCSP release	7.55.07
TCOSS module	7.55.07
PBX vendor	Philips
PBX Type	Sopho IS3000
Protocols	realQSIG
PBX SW release(s)	6810.32E, PROM release 140.32.4
Tested functions	BC, MWI, CD, CT, PR
TestRestrictions Problems Open Questions	AOC was not tested, as not supported by TC QSIG Path Replacement after CT does not work (Sopho does not trigger PR after successful CT by join) During the Call Transfer the primary call could not be put on HOLD, the PBX obviously does not support call HOLD, therefore the CT without HOLD should be used for this PBX
Summary	Integration tests were successful Meridian 1 is validated to be used with KCS Server Model 305 using both BRI and PRI QSIG connections as well

Specific Considerations/Configuration Hints

1. Trunk Types
Abbreviations BRI and PRI are used for basic and primary rate trunk
2. QSIG protocol variants
Sopho supports two QSIG protocol variants – QSIG and “real QSIG”. The QSIG comprises only the basic call functionality, the “real QSIG” comprises basic call and supplementary services as well. Therefore “real QSIG” is recommended to be used for KCS integration.
The “real QSIG” corresponds with the **ISO-QSIG protocol variant (default QSIG configuration on KCS side)**.
3. Configuring Message Waiting Indication (MWI)
No explicit configuration is necessary for MWI for Sopho, the PBX does not support the „Message Centre ID“ parameter. It is recommended to generate MWI orders on KCS side with empty „Message Centre ID“ parameter.
4. Call Hold & Call Transfer
Meridian 1 supports Call Transfer by join “into ringing”, but 1st (primary call) call of the two calls to be transferred need **not** be put on Hold prior to the transfer as Sopho does not support remote Hold notification (UIF config line 295, pos. 5 set to 01 and pos. 6 set to 00).
5. Path Replacement (PR) after Call Transfer does not work (no route optimization)
6. Network algorithm “Rerouting” for Call diversions not supported
Meridian 1 supports only the “Forward Switching” algorithm to perform call diversions via QSIG trunk (in the case KCS places an outgoing call to a Sopho extension that is being forwarded to other extension, Sopho establishes at first the 2nd call and then joins both calls together. On the other

hand, with "Rerouteing" Meridian 1 would only instruct KCS to disconnect the call to the 1st extension and establish the 2nd call to the other).

7. Sopho Models and relevant SW releases for QSIG

There are several possible models of Sopho PBX that depict using of particular hardware and line capacity (processor type, number of processors, lines etc.) but has no impact on specific features as the software releases are the same for all models:

Small models are: IS3000, 3010, 3030, 3050 and the current SW release is 6810.32E

Large models are: IS3070, 3090 and the current SW release is 9810.32E

(the leading 6xxx or 9xxx stand more or less only for model type)

PBX Configuration

```

PHILIPS SOPHO iS3000 Projecting Data
Settings for "Real QSIG" - Route:
<dirout:30
ROUTE    UNIT  BSPT  GEN-OPTS      GEN-TONE  CV  CC-TABLE
  30      1    -    0010010000000550550  0  -
INC-OPTS  TONE-AND-DDI-OPTS  TREE  A-QUEUE  OVE    SCNE
10100000000 000722222      0    16      -      -
OUT-OPTS  ATF
001100    0
NO INCOMING DIGIT CONV. ON THIS ROUTE (USE DIDGCO FOR OUTGOING DIGIT CONV.)
  SEQ    BUNDLE
    0      30
EXECUTED
Settings for "Real QSIG" - Bundle:
<dibndl:30;
BUNDLE  BSPT  ROUTE  UNIT  DIR-AND-NEG  OPTIONS          CON-AND-SIG-TYPE  ALL-CALLS
  30     -    30     1    2          2 0000000000000000  4    20      -
          *** 20 = A-Side (recommended)
          *** 21 = B-Side

Board Parameter:
Primary rate (PRI):
  Signalling Group: 5d21 (NNN) *** network side layer 3-1 (recommended)
                   5D20 (UUU) *** user side layer 3-1 (for info only !)

Basic rate (BRI):
  Signalling Group: 5c21 (NNN) *** network side layer 3-1 (recommended)
                   5c20 (UUU) *** user side layer 3-1 (for info only !)

Special considerations in the Network Parameter Block (MNPB):
In the MNPB change byte 35 from 0 to 1
  meaning: 1 stands for logical B channel numbering on PRI (1...30)
           0 would stand for timeslot B channel numbering on PRI (1...15, 17...31)
In the MNPB the byte 24 must have value 1 (PRI_CRC4_Multiframing)
As for Path replacement (PR) the Option 83 must be True
DTU - Prom release >= 140.32.4

```