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Business Communication Manager 50
Call Server 2000

> Solution Reference Design Guide For BCM50 to CS2K VoIP

Enterprise Solution Engineering
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Abstract

The proliferation of VoIP technologies and the subsequent interconnect of Nortel's Enterprise and Carrier networks, requires the dissemination of detailed concepts and configuration information.

This document describes the setup of a converged Carrier / Enterprise service consisting of PBX hosted subscribers that can leverage the wealth of services offered by the IP Telco Network.

Target Audience

This document is intended for an informed audience of Nortel Networks Sales Engineers, Deployment Primes, Installation personnel, and especially Customers.

Acknowledgements

This Configuration Guide is the product of numerous individuals and teams who have demonstrated the very best in teamwork, innovation, and integrity. The authors wish to extend their personal appreciation for their talented effort.

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1. Introduction

The coupling of Nortel' Succession Solution with the Business Communication Manager (BCM) has proven to be a significant step forward in the convergence of Enterprise and Carrier Networks.

It is fully anticipated that the addition of CS2K Gatekeeper functionality will result in a new specter of service offerings, and interconnect scenarios, to the Enterprise. This guide details the setup of a field deployable solution.

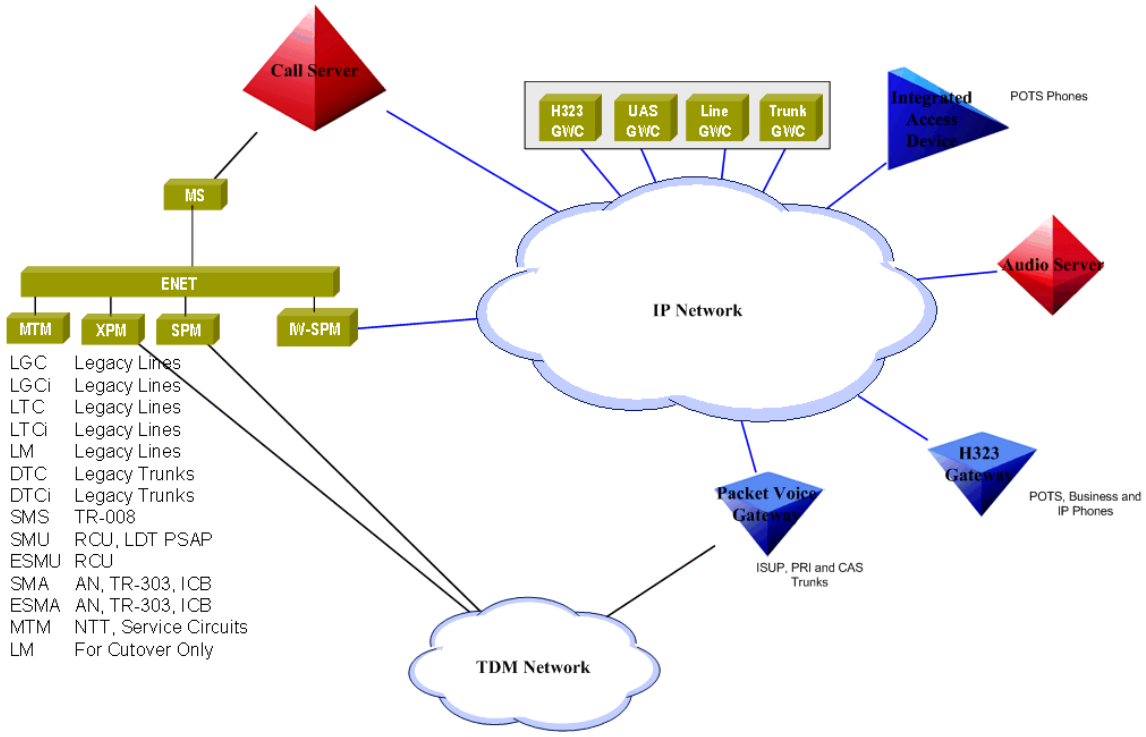

Figure 1: Succession Network Reference Architecture

1.1 BCM50 to CS2K Interconnection

The nuts and bolts of the architecture are the workings of the IP domain that binds the BCM to the CS2K (see Figure 2: Detailed Network Diagram). This new coupling of the traditional Carrier and Enterprise environments will require that SEs and Partners have a basic understanding of the components within this hybrid topology.

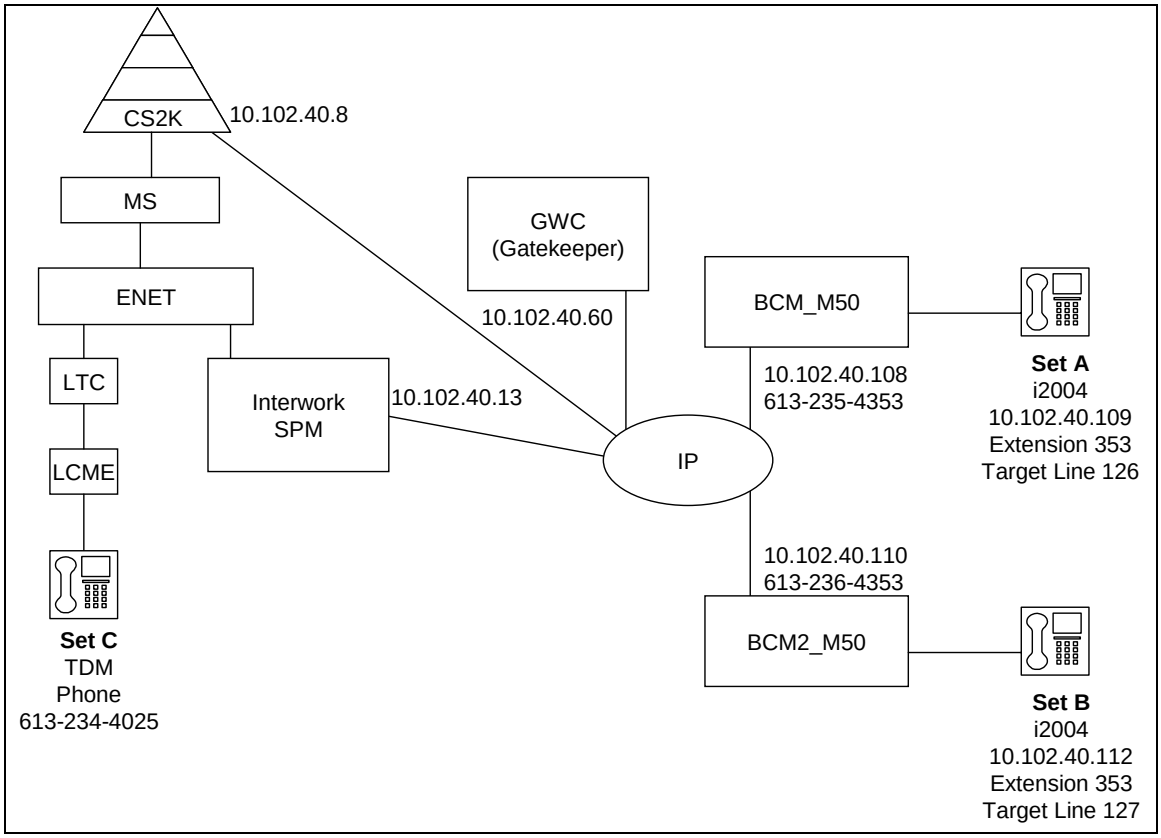

Figure 2: Detailed Network Diagram

From the Enterprise, Succession's CS2K will appear as a Gatekeeper in the IP space; and as such will require minimum programming to interoperate correctly. However, the challenge for SEs will rest with the design, implementation, and understanding of the carrier portion of the network.

The CS2K will view the BCM as a call processing destination, defined in terms of Directory Numbers (DN), virtual trunks, and gateway endpoints. Detailed examples of these entities are available in the following chapters of this document.

1.2 Availability and Ordering

This solution applies to the following Generally Available (GA) software streams:

- BCM50 Release 1
- SN07, ISN07, SN08, and ISN08

1.3 Use Case

Within this document, a simple office-code translation plan will be used as a reference framework. From Figure 2: Detailed Network Diagram, the BCM50s are accessed via an area code of 550; a VoIP Trunk access code of 9 will be used on the BCMs. From the above diagram, here are a few examples of dialing sequences:

- A (BCM_M50) calls B (BCM2_M50) via the CS2K, A dials: 9-550-236-4353
- B (BCM2_M50) call A (BCM_M50) via the CS2K, B dials: 9-550-235-4353
- A calls C (CS2K analogue line), A dials: 9-234-4025
- C calls B (BCM2_M50), C dials: 550-235-4353

2. CS2K Setup

It should be clearly understood by the reader that the design and implementation of translations is customer specific. What is contained herein is one way of accomplishing the objective; there are other methods which are equally effective.

To simplify the vulgarization of the concepts within, a North American ISDN PRI context was selected. This does not limit this solution to that signaling context; it does work with other PRI variants.

2.1 Software Optionality Control (SOC)

It is critical that the CS2K have the H.323 Gatekeeper functionality activated. For further information on the SOC, please consult NTP 297-8991-901 (www.nortel.com); customers may purchase software activation codes from authorized Nortel Sales Representatives.

For the H.323 Gatekeeper, please ensure that CS2B0004 is enabled. Firstly, you need to unlock the SOC by assigning a limit; this will also set the right to use flag:

- assign limit 100 <license key #1> to CS2B0004

Secondly, activation is accomplished by setting the state. This requires a second license key:

- assign state on <license key #2> to CS2B0004

When completed, the CS2B004 option should appear as follows:

```
>soc
SOC:
OPTION    NAME              RTU STATE   USAGE   LIMIT    UNITS  LAST_CHG
CS2B0004  H323 Gatekeeper     Y   ON      8     100      1VC  05/01/20
```

2.2 Trunking

The CS2K needs to have unique addressable connection paths on which it may route calls to each BCM. These are referred to as trunk members within a group. They are defined in the following order through the tables.

2.2.1 TABLE: CLLI

The Common Language Location Identifier, or CLLI, is the route of the trunk group datafill. In this example, the CLLI BCM_M50 is associated to an administrator.

```
CLLI ADNUM TRKGRSIZ ADMININF
----------------------------
BCM_M50 411 50 PIERRE_FOURNIER
```

2.2.2 TABLE: TRKGRP

The trunk group is characterized with PRA to indicate that it will appear to call processing as ISDN PRI signaling and ISDN translations.

GRPKEY GRPTYP TRAFSNO PADGRP NCCLS GRPINFO

BCM_M50 PRA 0 NPDGP NCRT MIDL N (ISDN 550) $ $

2.2.3 TABLE TRKSGRP

Detailed signaling setup (DS1, Q.931) and physical location (GWC card & port) are defined here.

SGRPKEY CARDCODE SGRPVAR SGRPVAR

BCM_M50 0 DS1SIG ISDN 20 20 87Q931 2 N STAND NETWORK PT_PT USER N UNEQ 160 N DEFAULT GWC 9 114 1 64K HDLC $ $

2.2.4 TABLE TRKMEM

CLLI EXTRKNM SGRP MEMVAR

BCM_M50 1 0 GWC 9 114 2
BCM_M50 2 0 GWC 9 114 3
BCM_M50 3 0 GWC 9 114 4
BCM_M50 4 0 GWC 9 114 5

2.3 Call Processing (CallP) Translations

Designing CallP translations requires training and experience. The text of this section provides enough information to permit qualified personnel to complete the task. It is not a replacement for adequate training; please do not attempt unless properly qualified to do so.

The trunk group has been defined as an ISDN PRI, so the next step is to define a set of rudimentary translations to be able to route the calls to and from the BCM. For this,

- a “type” of translation is defined in XLAPLAN
- an office route in table OFRT
- association between the dialed digits and the office routes in HNPACONT and its sub tables
- and finally, the ISDN specifics in “LT” family (ISDN Logical Terminal) of tables

2.3.1 TABLE XLAPLAN

```
XLAPIDX SCRNCL HSTS PRTNM ZEROMPOS RESINF OPTIONS ADMININF
------------------------------------------------------------
BCM_PRI_TRAF NSCR 550 PRI_TRAF NONE N $ PRI_TRAFFIC
```

2.3.2 TABLE OFRT

```
RTE RTELIST OPTIONS
-------------------
550 (N D BCM_M50 0 N N) $ $
```

2.3.3 TABLE HNPACONT

```
STS SNPA NORTREFS NOAMBIGC RTEREF HNPACODE ATTRIB RTEMAP
OPTIONS
-----------------------------------------------------------------
613 Y 1023 0 (237) (1) (0) (0) $
```

2.3.3.1 SUB RTEREF

```
RTE RTELIST
-----------
55 (T OFRT 550) $

RET
613 Y 1023 0 (237) (1) (0) (0) $
```

2.3.3.2 SUB HNPACODE

```
FROMDIGS TODIGS CDRRTMT
-----------------------
235 235 LRTE 55

RET
613 Y 1023 0 (237) (1) (0) (0) $
```

2.3.4 TABLE LTDEF

Is the Logical Terminal (LT) definition table; it defines logical terminals and access privileges. It also specifies an LTID and access privileges for the PRI trunk group.

```
LTKEY LTAP CLASSREF
-------------------
```

ISDN 550 B PRA 47 NTNAPRI V1 NIL (NOPMD) $

2.3.5 TABLE LTDATA

The logical terminal data table stores service-related data associated with the logical terminal identifier (LTID), field LTDKEY, which is the key to this table.

LTDKEY LTDRSLT

ISDN 550 SERV SERV Y Y ALWAYS ALWAYS (PRI_IP_PROT H323) $

2.3.6 TABLE LTCALLS

Logical terminal calls table. It specifies the types of calls that can route over each PRI trunk group. This table defines the first translations for each trunk group and call type.

LTID XLARTSEL OPTIONS

ISDN 550 PUB XLALEC 0 BCM_PRI_TRAF NLCA_NILLA_0 $

2.3.7 TABLE LTMAP

The logical terminal map table associates the logical terminal identifier (LTID) to a trunk group (identified by CLLI).

LTKEY MAPPING OPTION

ISDN 550 CLLI BCM_M50 (TEI 0) $

2.4 Packetization

Succession CS2K Solution supports both 10 and 20 millisecond (ms) rates; what is critical is that all components bet set to the same value. Care must be taken to ensure that the IW-SPM and the GWC are set to the same rate as the CS2K and the BCM.

The IW-SPM, required for interwork with locally hosted legacy lines, is set as follows for 20 ms:

TABLE MNIPPARM
TOP
MNKEY DFCODEC PRFCODEC PKTRATE INGRESS EGRESS JITMIN JITMAX JITTARG ECAN
VOICE CMFNOISE T38 RFC2833 RTCP TONESET LOGINT CRCERROR USIZEPKT OSIZEPKT
FRAGMENT JABBER DROPEVNT BRDCAST JITTER LATENCY VPKTLOST MINLOG OMPARMS

IWSPM G711ULAW G729 **20** 0 0 0 100 0 DISABLE OFF DISABLE DISABLE DISABLE N
NORTHAMERICA 5 20 10 20 10 20 10 20 10 20 10 20 10 20 10 20 10 20 10 20 10
1000 50 1000 1000

Please see 4.4 Configuring Voice Network Settings for information on the GWC packetization setup.

2.5 ETSI PRI Trunks & Overlap Signaling

There are two types of signaling associated with ISDN PRI: ENBLOC and OVERLAP. Both pertain to the method in which digits are forwarded, first refers to the method when all digits are sent at one time and the latter where they are forwarded in multiple messages. Unused in North America, overlap is quite common in the remainder of the world.

There are a few key points that should be highlighted to ensure simple operation of a BCM connected to an overlap aware network:

- In general BCMs, who do not support overlap signaling, can interoperate with PRI overlap signaling provided all digits are contained within the H.323 setup message.
- Future CS2K releases intend to incorporate PRI variant checking to ensure that H.323 trunk groups destined to BCMs will not support overlap signaling.

2.5.1 Problem Identification

The BCM will reject H.225 setup messages that contain the “canOverlapSend” flag set to “True”, see highlight box in**Error! Reference source not found.**

```
No.     Time        Source                Destination           Protocol Info
      8 6.576712    10.105.2.60           172.16.2.39           H.225.0/H.245 CS: setup Open

Frame 8 (309 bytes on wire, 309 bytes captured)
Ethernet II, Src: NortelNe_ff:37:c8 (00:0c:f8:ff:37:c8), Dst: Radisys_0e:5e:10 (00:00:50:0e:
Internet Protocol, Src: 10.105.2.60 (10.105.2.60), Dst: 172.16.2.39 (172.16.2.39)
Transmission Control Protocol, Src Port: 32985 (32985), Dst Port: 1720 (1720), Seq: 1, Ack:
TPKT, Version: 3, Length: 255
Q.931
    Protocol discriminator: Q.931
    Call reference value length: 2
    Call reference flag: Message sent from originating side
    Call reference value: 5263
    Message type: SETUP (0x05)
    Sending complete
    Bearer capability
        Information element: Bearer capability
        Length: 3
        ...0 0000 = Information transfer capability: Speech (0x00)

DELETED TEXT

H.225.0 CS
    H323_UserInformation
        h323-uu-pdu
            h323-message-body: setup (0)
                setup

DELETED TEXT

                    0... .... mediaWaitForConnect: False
                    0... .... canOverlapSend: True
                    0... .... multipleCalls: False
                    0... .... maintainConnection: False
```

Figure 3: H.225 Setup Packet Trace

2.5.2 Workaround

Setting the Q.931 “sending complete” flag will allow the BCM to ignore the canOverlapSend value and accept the incoming H.225 setup message. The CS2K’s call processing translations can do this on a per trunk basis; this is accomplished in table PXCODE.

2.5.2.1 Identifying the Correct Entry in Table PXCODE

A quick way to identify the target tuple is to execute a traver. You will need 2 pieces of information: a valid DN on the CS2K, and the trunk access code for the BCM. For this example, we are using DN 820-2524 with a trunk access code of 323. Note that the destination digits used, i.e. 1234567, are simply padding.

The relevant data is highlighted in yellow:

```
traver l 8202524 3231234567 b
TABLE IBNLINES
LG 00 0 00 31 0 DT STN IBN 8202524 CSLINES 0 0 115 $
TABLE DNATTRS
TUPLE NOT FOUND
TABLE DNGRPS
TUPLE NOT FOUND
TABLE IBNFEAT
TUPLE NOT FOUND
TABLE CUSTSTN
TUPLE NOT FOUND
TABLE OFCVAR
AIN_OFFICE_TRIGGRP NIL
INAP Origination Attempt TDP:  no subscribed trigger.
INAP Info Collected TDP:  no subscribed trigger.
TABLE NCOS
CSLINES 0 0 0 DFLT $
TABLE CUSTHEAD: CUSTGRP, PRELIMXLA, CUSTXLA, FEATXLA, VACTRMT, AND DIGCOL
CSLINES NXLA K4PSTN CSFETXLA 0 CSACCDIG
TABLE DIGCOL
CSACCDIG 3 COL L 7
TABLE IBNXLA: XLANAME K4PSTN
TUPLE NOT FOUND
Default from table XLANAME:
K4PSTN
   (NET N N 0 N CSDIG N Y DOD N K4PSTN CS_NPRT CS_NIL NONE $) $ F
TABLE DIGCOL
CSDIG 3 COL L 7
TABLE LINEATTR
K4PSTN IBN NONE NT 0 0 NILSFC 0 PX K4PSTN NIL 00 CS_NPRT CS_NIL $
LCABILL OFF - BILLING DONE ON BASIS OF CALLTYPE
TABLE XLAPLAN
CS_NPRT NSCR 115 NPRT NONE N $ $
TABLE RATEAREA
CS_NIL NLCA NIL NILLATA $
TABLE PXHEAD
K4PSTN DFLT CONT ( MM 7 7) ( XLT PX K4PSTN)$ DFOP ( CLASS INTL) ( AMAXLAID PSTN)$
NOCON STD
THE DIGITS USED TO INDEX THE NEXT TABLE ARE:                3231234567
TABLE PXCODE
```

```
K4PSTN 323 323 RTE ( PF 3) ( MM 5 18) ( DEST 115)$
TABLE: PXRTE
KEY: K4PSTN  115
 . S OTT5BCM
EXIT TABLE PXRTE
TABLE AMAXLAID
PSTN DFLT (FLEXCTYP GENERIC 900 OVRDALL )$
INAP Info Analyzed TDP:  no subscribed trigger.
INAP Route Select Failure TDP:  no subscribed trigger.

+++ TRAVER: SUCCESSFUL CALL TRACE +++
DIGIT TRANSLATION ROUTES

1 OTT5BCM                N CDN  E164  IN  1234567 NIL_NSF   BC SPEECH

TREATMENT ROUTES.  TREATMENT IS: GNCT
1 BUSYANN

+++ TRAVER: SUCCESSFUL CALL TRACE +++
```

From this we see that the PXCODE entry is K4PSTN 323 323, and that the current minimum digits is 5 with a maximum of 18. We will need to reset these values to 7 and 7; as we are using 7 digit dialing to the BCM.

2.5.2.2 Table PXCODE

The following is a session capture of the required change; it is self explanatory.

```
>TABLE PXCODE; pos K4PSTN 323 323
JOURNAL FILE UNAVAILABLE - DMOS NOT ALLOWED
TABLE: PXCODE
 K4PSTN          323          323
RTE (PF 3) (MM 5 18) (DEST 115) $

>cha
JOURNAL FILE UNAVAILABLE - DMOS NOT ALLOWED
ENTER Y TO CONTINUE PROCESSING OR N TO QUIT
>y
XLASEL: RTE
>
OSEL: PF
>
PFDIGS: 3
>
OSEL: MM
>
MIN: 5
>7
MAX: 18
>7
OSEL: DEST
>
```

```
DEST: 115
>
OSEL:
>$
TUPLE TO BE CHANGED:
 K4PSTN          323          323
RTE (PF 3) (MM 7 7) (DEST 115) $

ENTER Y TO CONFIRM, N TO REJECT OR E TO EDIT.
>y
TUPLE CHANGED
JOURNAL FILE INACTIVE

>list
XLANAME        FROMD          TOD
                                                        XLADATA
--------------------------------------------------------------------------------
 K4PSTN          323          323
RTE (PF 3) (MM 7 7) (DEST 115) $
```

3. BCM50

The BCM50 is programmed via a new application, the Element Manager, available via HTTP access to the maintenance port. A good number of screen captures of this new Element Manager have been included in this document in order to familiarize users with both the location and the format of the programming information.

3.1 Caveats

3.1.1 Centrex IP Call Manager (CICM) SN07 Testing

The specific combination of BCM50 to CICM VoIP lines in the SN08 context was successfully tested. An SN07 CICM setup was not available at the time of test, and was not explicitly verified. However, it is expected that there will be no operational differences between the SN08 and SN07 versions.

3.1.2 Called Party Number Display (CPND)

3.1.2.1 Network Name Display

Business Communications Manager displays the name of the calling party, when available, on both Private and Public ISDN PRI interfaces. The displayed name can include the Receiving Calling Name, Receiving Redirected Name, and/or Receiving Connected Name.

If only a number is available for CLI on an incoming call, you can program a system speed dial in such a way that a name displays when that number calls in.

The outgoing name display consists of the Business name and the telephone name.

The following table provides a list of the name/number display features and the list of ISDN interfaces that support each feature.

	Interface					
Feature	**NI PRI**	**DMS Custom PRI**	**SL1 (MCDN)**	**NI-BRI**	**ETSI EURO**	**ETSI QSIG**
Receiving Calling Name	Supported	Supported	Supported	Supported		Supported
Receiving Redirected Name	Supported		Supported	Supported		Supported
Receiving Connected Name		Supported	Supported			Supported
Sending Calling Party Name	Supported	Supported	Supported			Supported
Connected Name Supported		Supported	Supported			Supported

Table 1: CPND Test Results

Note: Network Name Display is an optional feature that is available based on the interface you subscribe to.

MCDN note: MCDN networks fully support name display features.

3.1.2.2 Receiving and Sending Calling Party Name

Network Name Display allows the name of an incoming PRI/BRI, analog with CLID, or VoIP with MCDN call to appear on the Business Communications Manager telephone receiving the call. Calling Party Name with status of Private can appear on the Called Party telephone as Private name. If the incoming Calling Name is defined by the CO as a private name, then Private name appears on the answering telephone. If the Calling Party Name is unavailable it can appear on

the Called Party telephone as Unknown name.

If the call is answered by a Hunt group, the hunt group name appears instead of the telephone name in forming the connected name.

The Connected Name is a transient display that appears for approximately three seconds. The Connected Name is sent only if the OLI is programmed (“Configuring line access” on page 405). You can program both a public and private OLI. The system uses the one appropriate to the type of call.

3.1.2.3 Network name display interactions

If available, the Calling and Connected Name information passes between trunks with Selective Line Redirection (SLR). Only Calling Name information passes between trunks in cases where Direct System Inward Access (DISA) results in tandeming of trunks.

3.1.3 T.38 FAX

T.38 FAX support is enabled via the selection of the BCM profile in the GWC. Supported functionality and detailed configuration information for the CS2K, GWC, and the BCM can be found on www.nortel.com .

3.2 Key Codes

Ensure that the system has an appropriate number of the following key coded functionality:

- IP Client seats
- VoIP GW Trunks

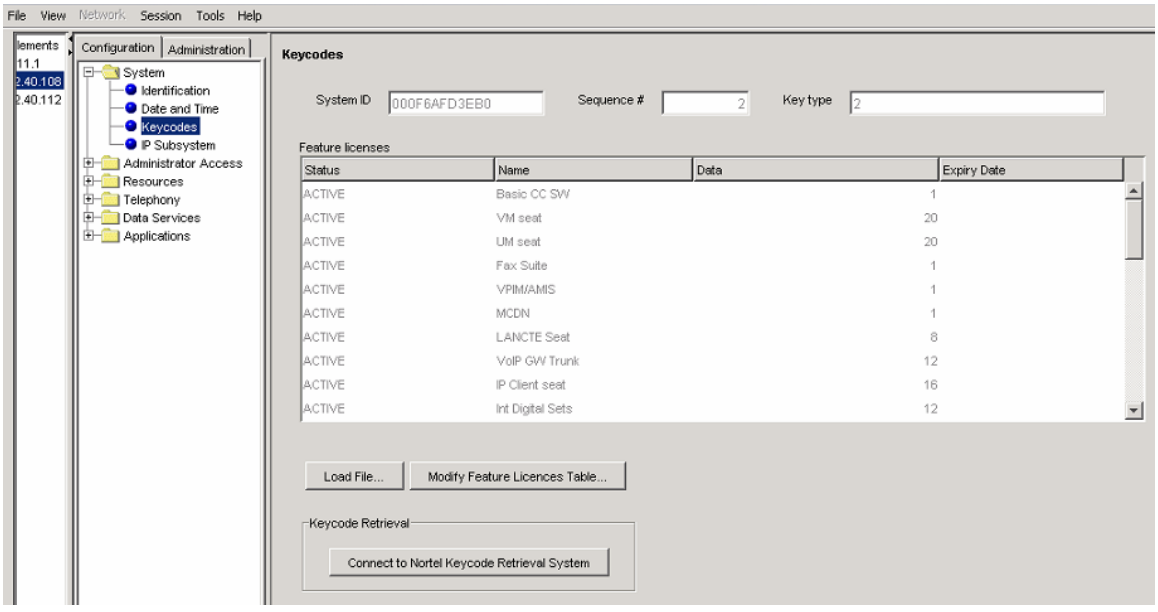

Figure 4: BCM50 Key Codes

3.3 IP Networking

The BCMs in this example are configured as per Figure 2: Detailed Network Diagram on page 5. If DHCP is used for the IP Sets, it needs to be activated and a range of IPs need to be setup via the Address Range Tab (Figure 6: BCM50 DHCP, General Settings).

Note: in order to simplify the setup, BCM50 NAT is not used.

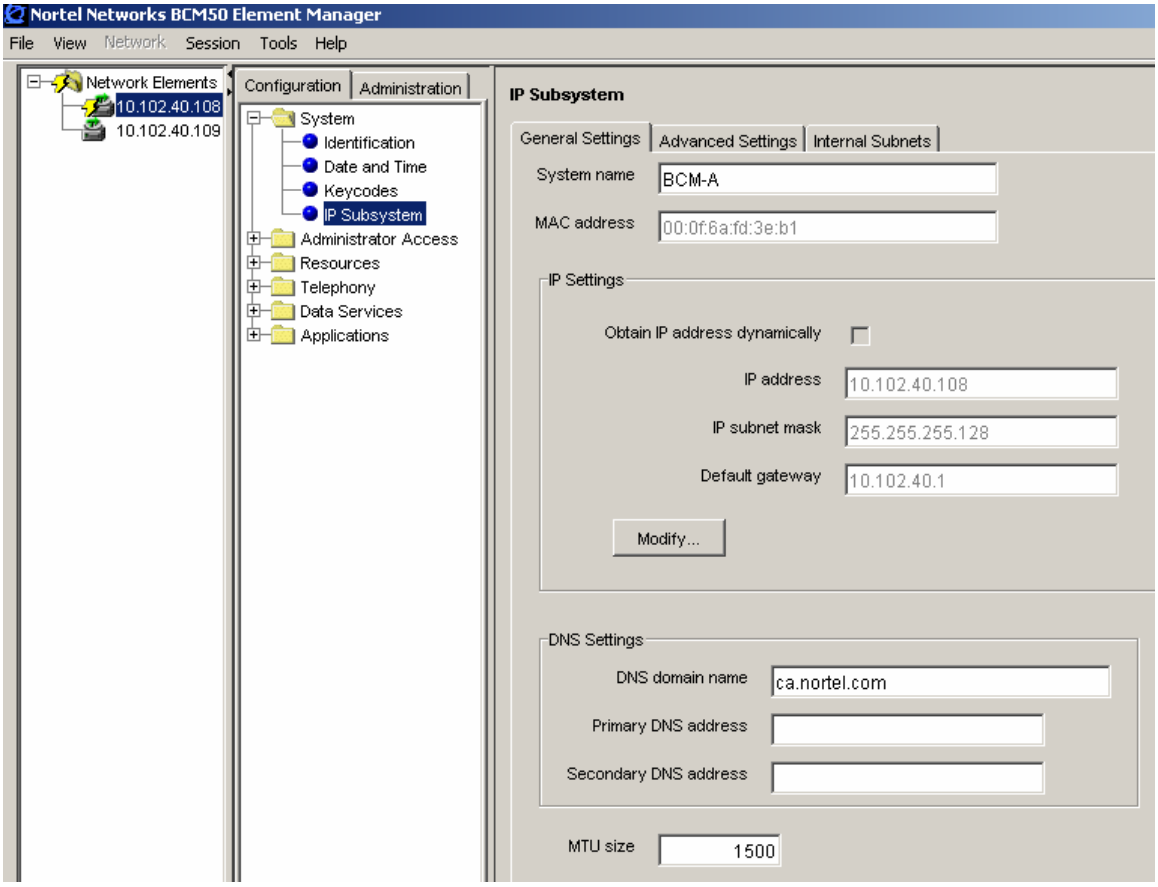

Figure 5: BCM50 IP Addressing

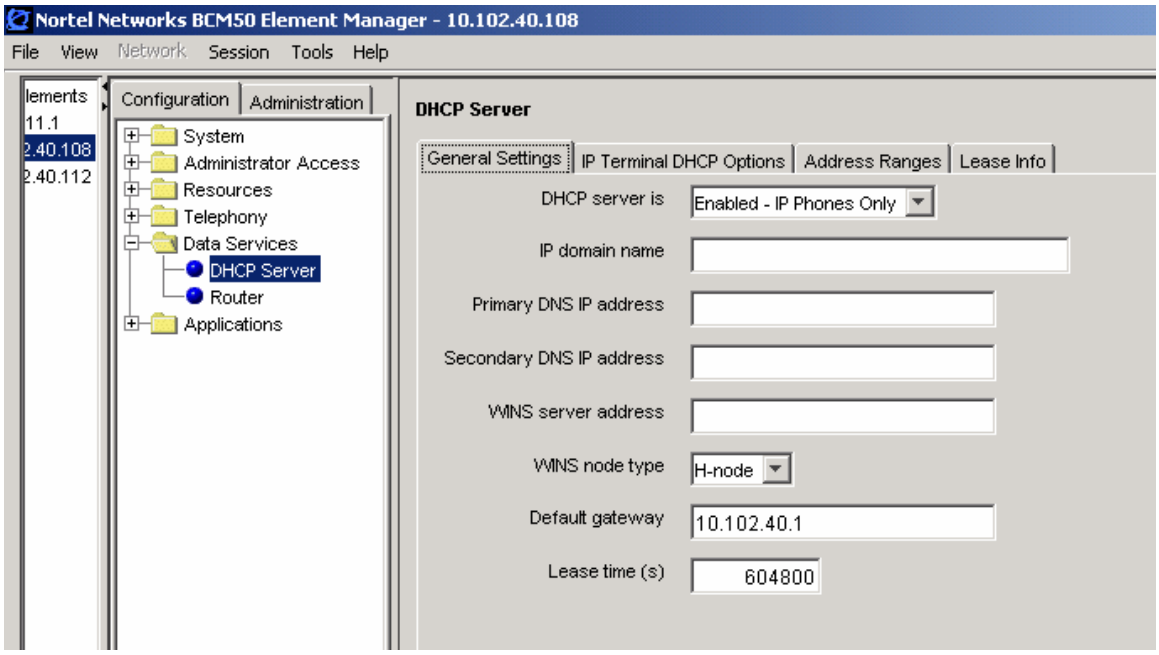

Figure 6: BCM50 DHCP, General Settings

3.4 IP Telephony Resources

The IP Telephony resources are listed in the Telephony Resources level of the Resources level. It is at this point where the default CODEC and packetization (payload size) are configured.

In section 2.4 Packetization, the reader is reminded that Succession supports both 10 and 20 mS sampling rates, and the selected value must be consistently applied to both the IW-SPM and the GWC. The selected value must also be used in the BCM50.

Note that the IP and Application Sets module must be highlighted (clicked upon) in order to see the details.

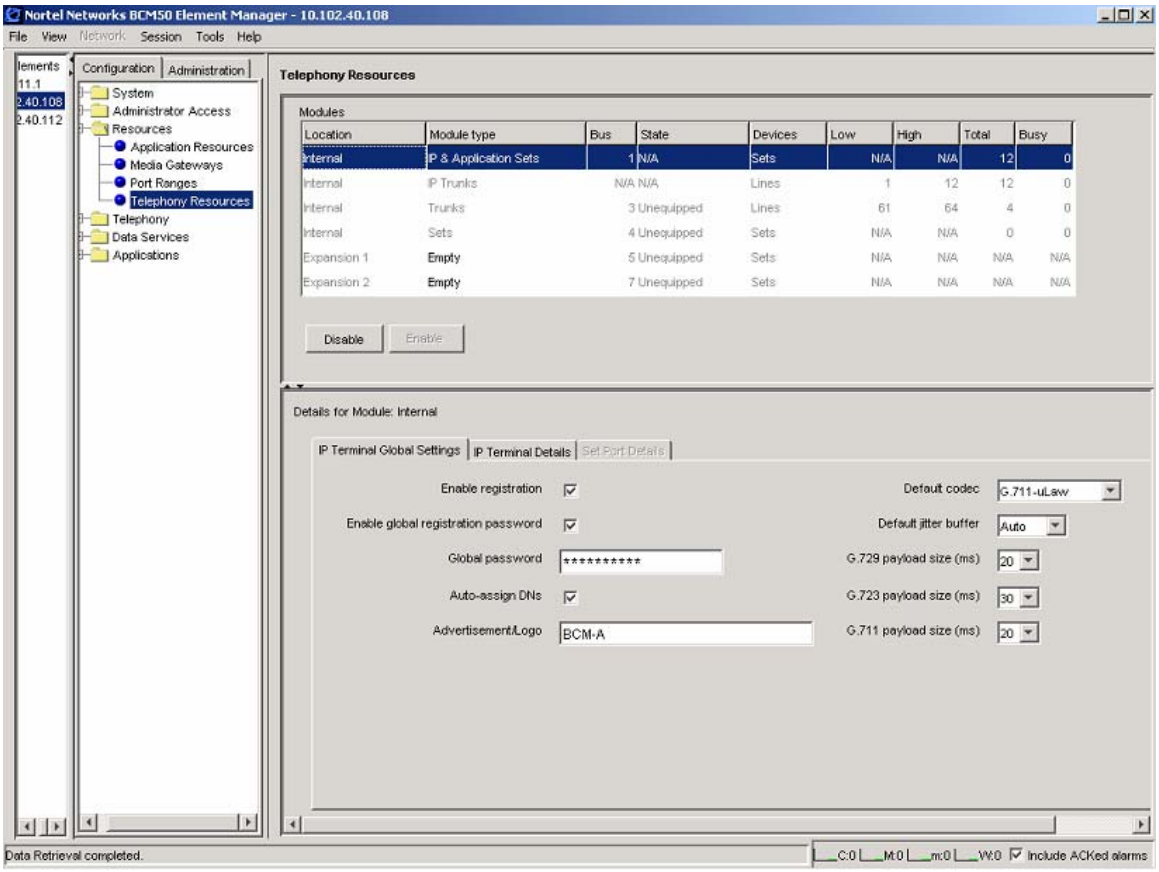

Figure 7: BCM50 Telephony Resources, IP Terminal Global Settings

Any active IP sets will be displayed in the IP Terminal.

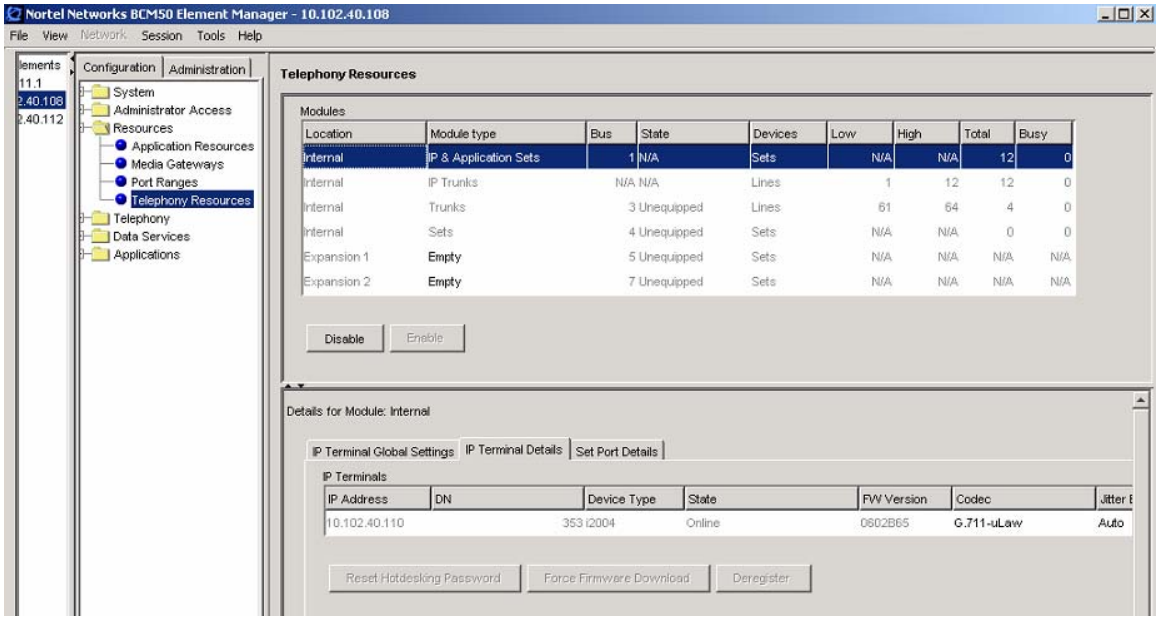

Figure 8: BCM50 Telephony Resources, IP Terminal Details

3.5 Telephones & Lines

Start with the selection of a target line. Program both the Public and Private received digits.

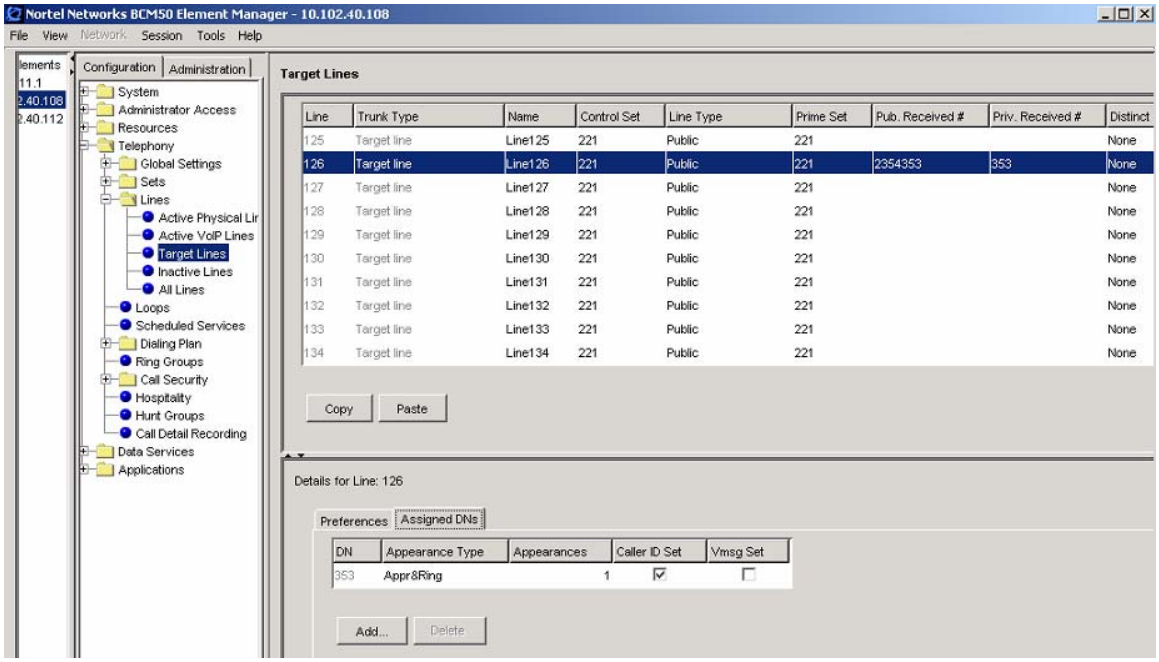

Figure 9: BCM50 Lines, Target Lines

The target line is assigned to the Set at the Active Sets level. In addition the Public and Private Outgoing Line Identification (OLI) can to be programmed here.

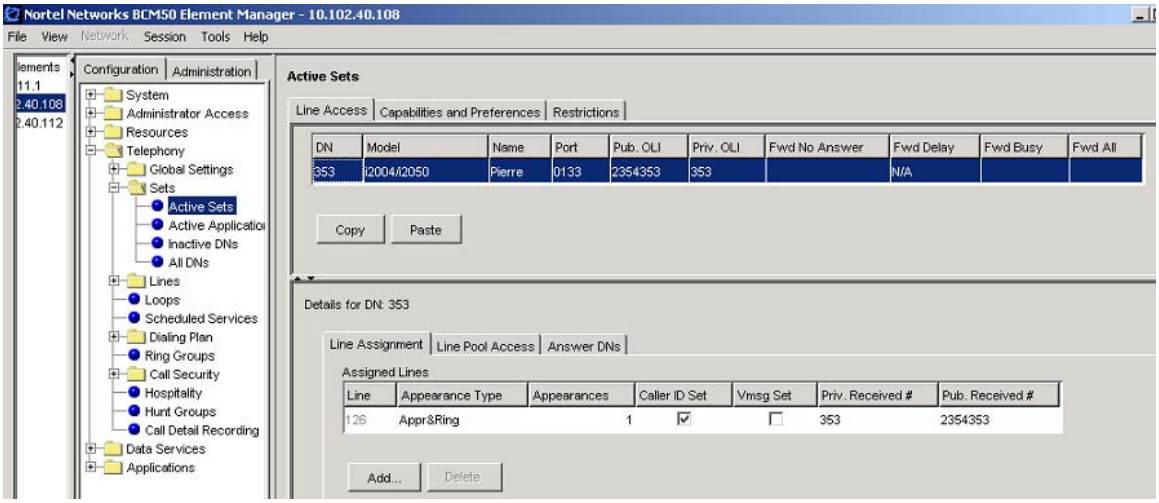

Figure 10: BCM50 Telephony, Active Sets

3.6 Dialing Plan

A few key settings are captured in the following screen shots:

- Public received number length: 7 digits (CS2K pushes 613-234-4353)
- Public network dialing plan: National

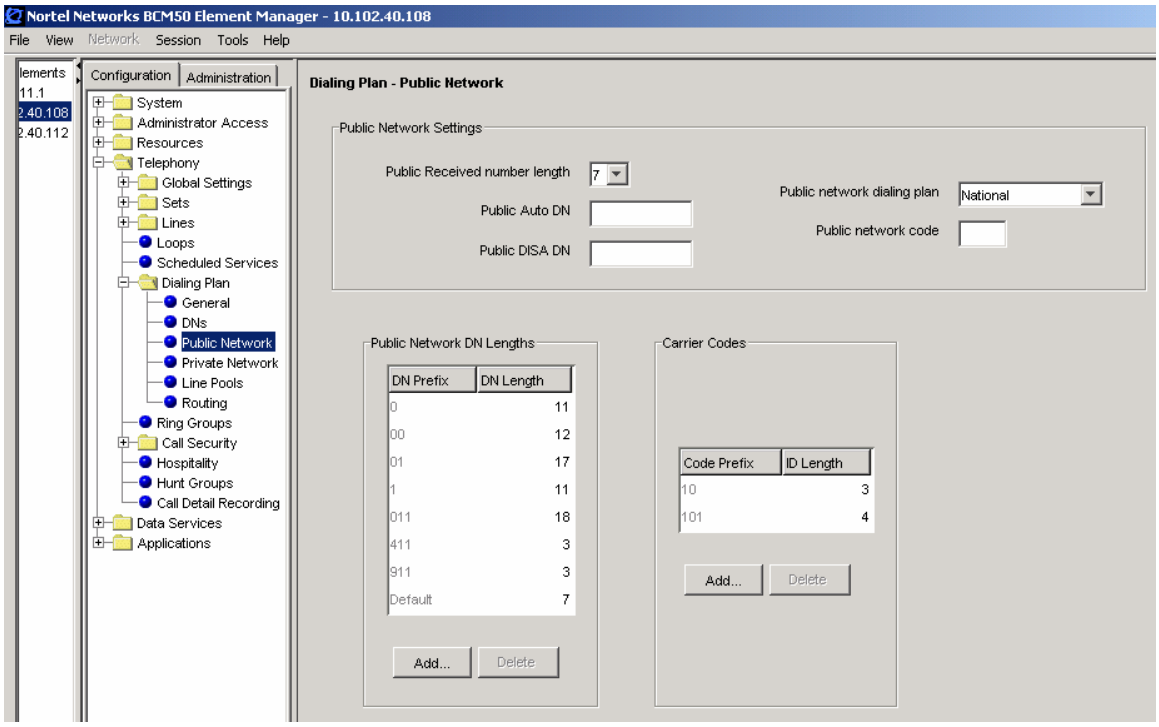

Figure 11: BCM50 Dialing Plan, Public Network

Note: No changes were made to the Private Network settings. Pictured here are the defaults used.

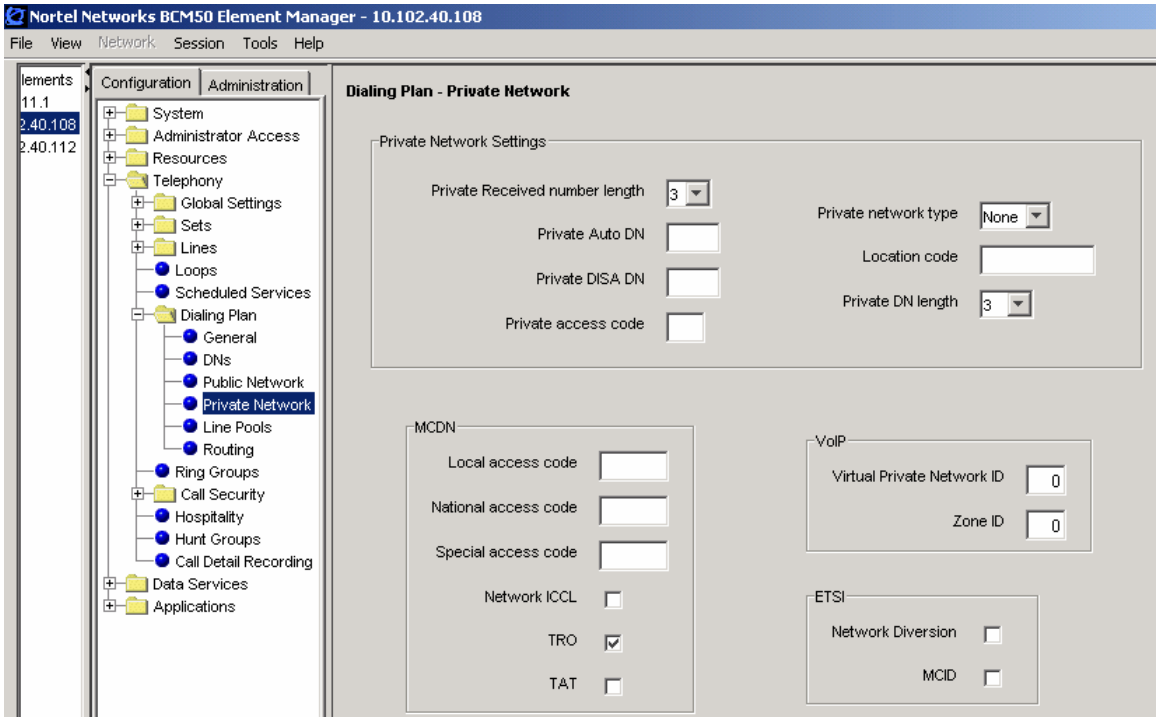

Figure 12: BCM50 Dialing Plan, Private Networks

A new route, number 100, was created and assigned to BlocA the VoIP pooled resources. Note that the external number, digits that can be inserted as a prefix, was intentionally left blank.

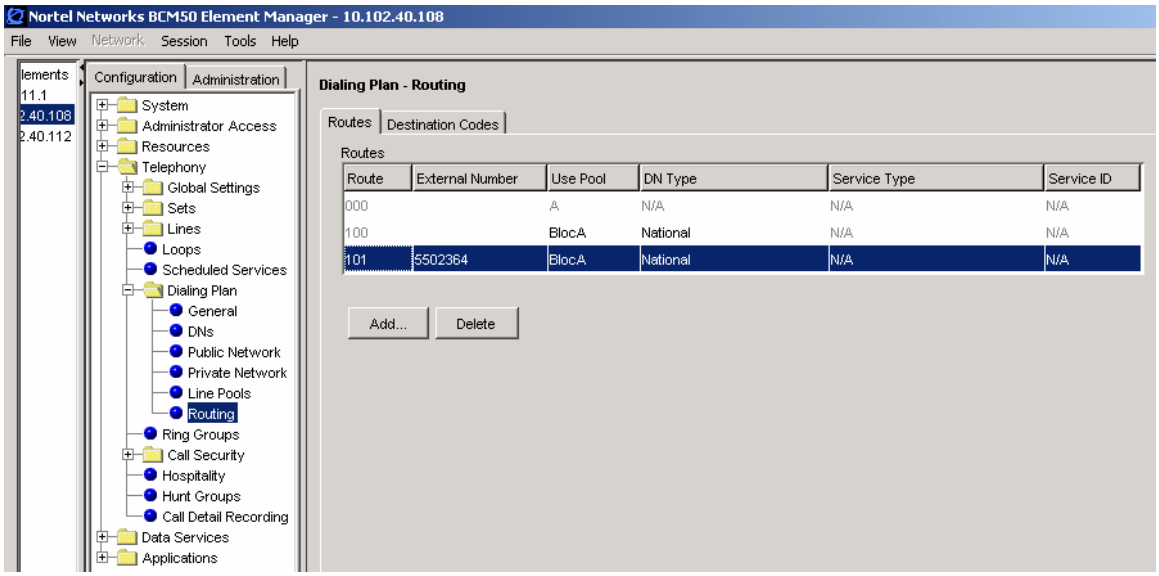

Figure 13: BCM50 Dial Plan - Routing, Routes

It was simpler if the access code of 9 was to be used to access an outgoing line form the BCM50. Thus, destination code 9 was mapped to route 100, with an absorbed length of all (digit 9 is not passed to the CS2K).

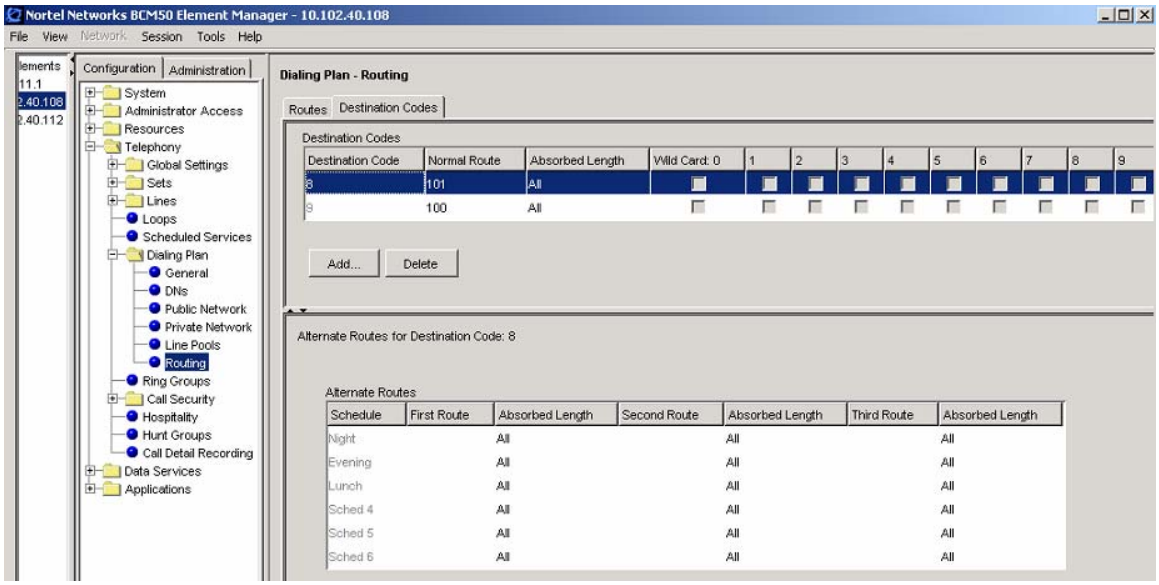

Figure 14: BCM50 Dial Plan - Routing, Destination Codes

As a final check, the linepool to DN assignment is verified. Here, DN 353 does have access to BlocA.

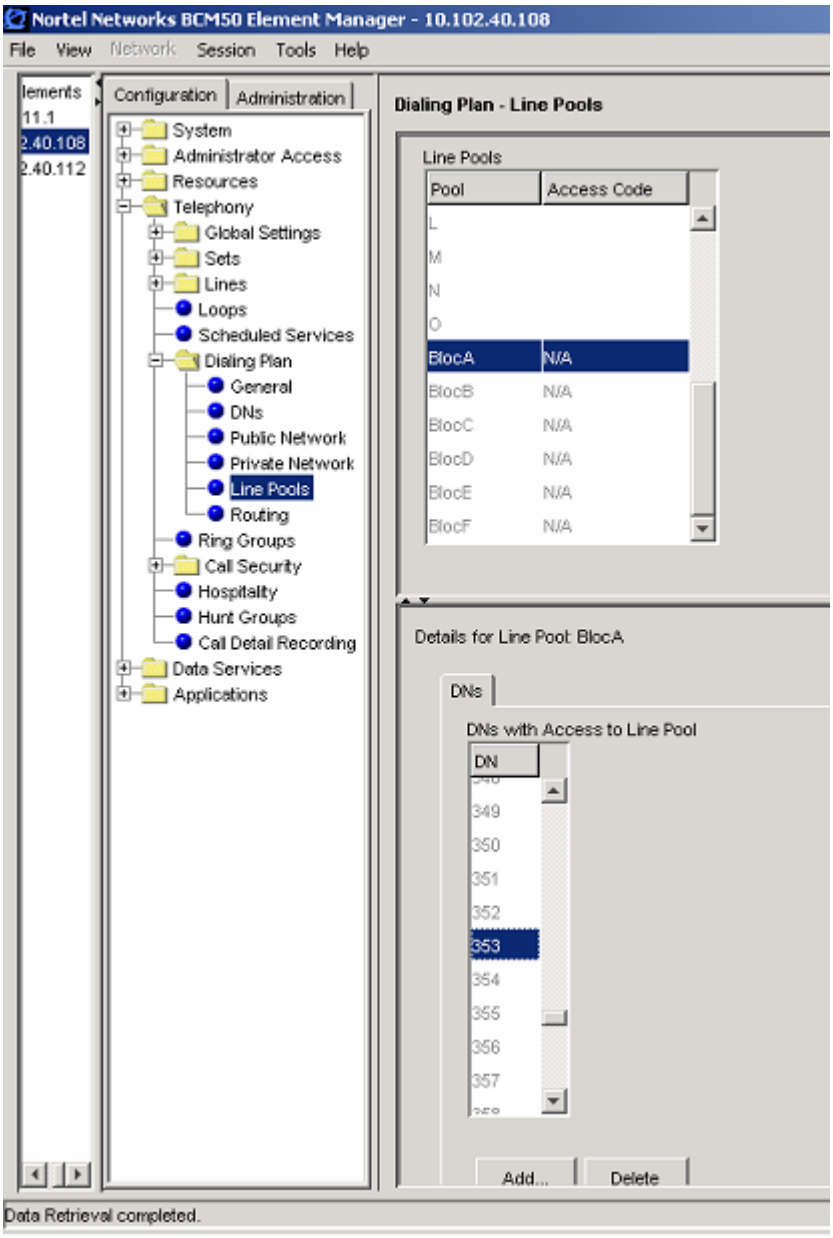

Figure 15: BCM50 Dialing Plan - Line Pools

3.7 H.323

Key points for this part of the setup are:

- RTP and UDP Ports Ranges were left to the default settings
- Verify that the call signaling port is set to 1720 and the RAS to 1719. The RAS setting must match the GWC value (see Figure 21: GWC – Associate Media Gateway)[1]

[1] This follows the common convention for Call Signaling and RAS port settings. Note that for BCM 3.x on the BCM200/400/1000, port 1719 is used for the internal gatekeeper associated with support for Symbol NetVision phones and cannot be used for CS2K RAS. See Nortel technical configuration ITAS TIP 317 GL, January 2005, for additional details on selecting an appropriate RAS port for BCM 3.x systems.

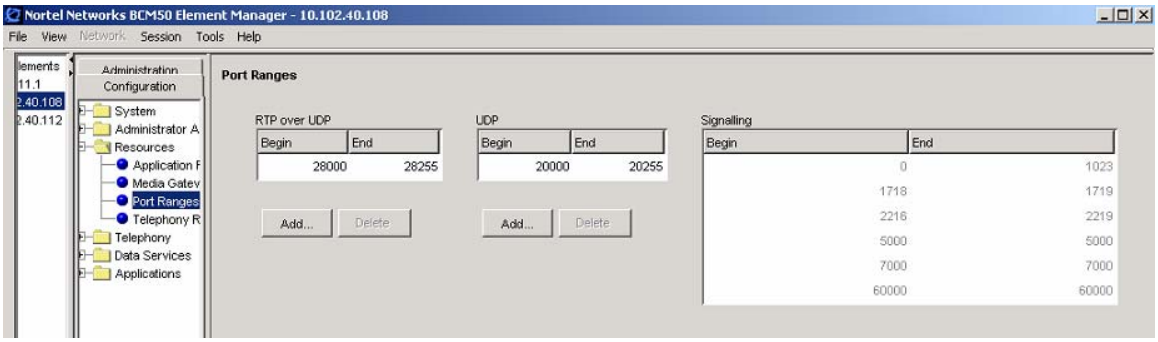

Figure 16: BCM50 Port Ranges

The details of the CS2K are added at the Telephony Resource, IP Trunks level:

- H.323 Call signaling: Gatekeeper Routed
- Primary Gatekeeper IP: the GWC's IP
- Alias Name: must match value in GWC (Figure 21: GWC – Associate Media Gateway)
- Gateway Protocol: none

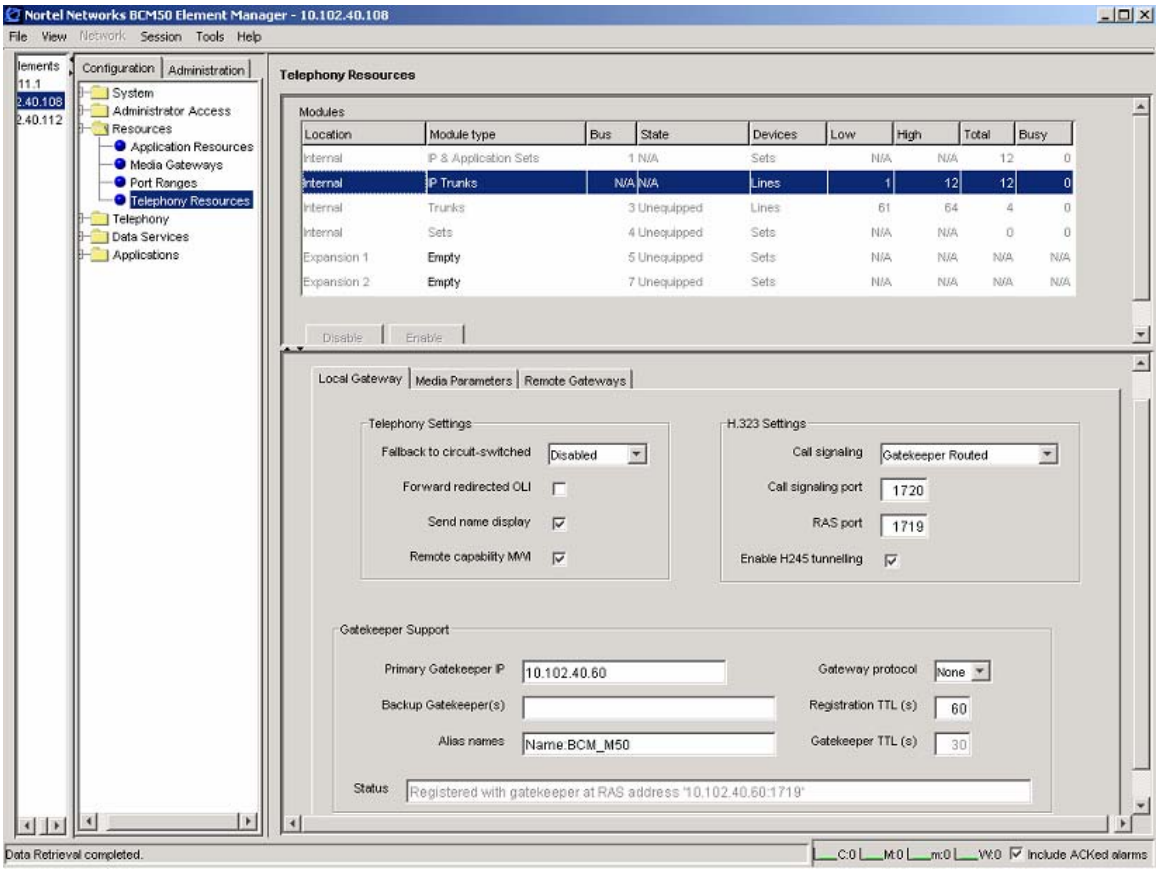

Figure 17: BCM50 Telephony Resources – IP Trunks, Local Gateway

Click on the Media Parameters tab, and verify/set the values for

- Preferred CODEC list: ensure G.711 and G.729 are included
- Set the default sample sizes to either 10 or 20 mS and remember to set matching values on IW-SPM and GWC.

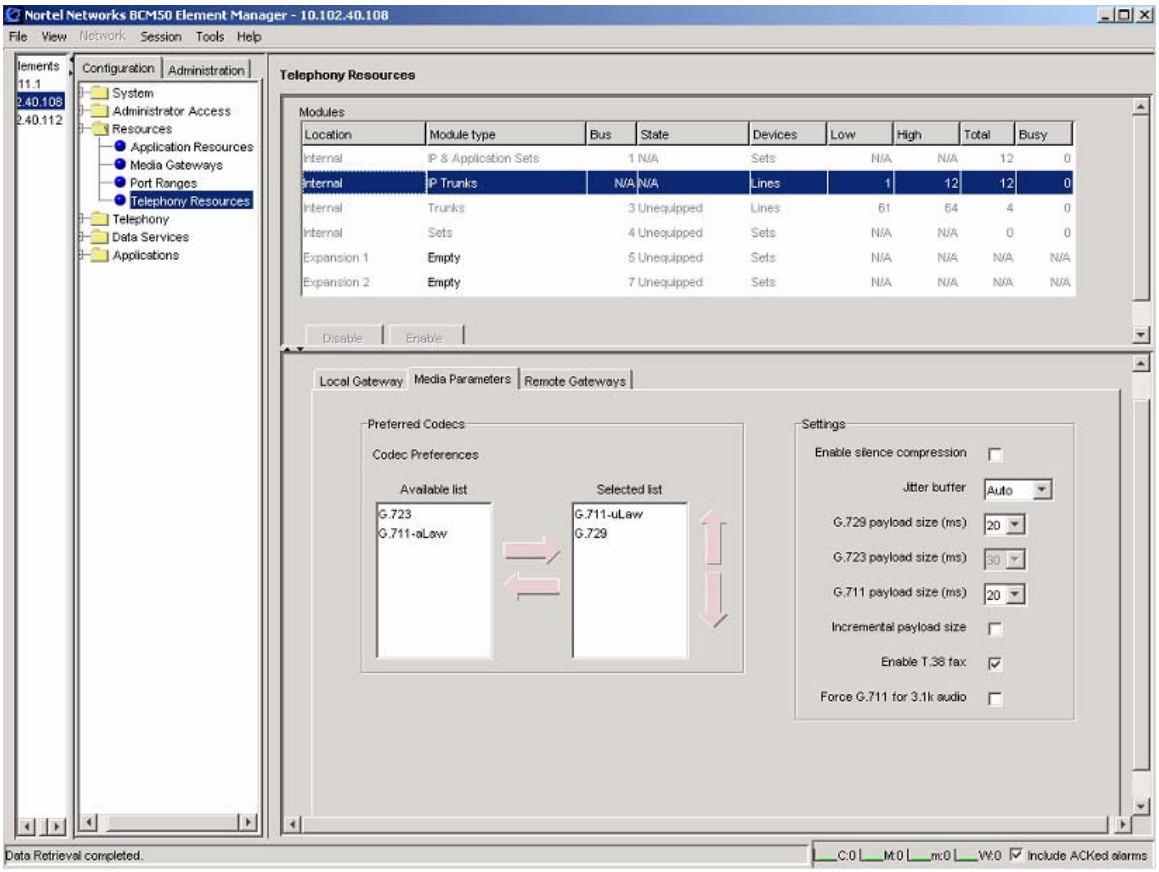

Figure 18: BCM50 Telephony Resources, Media Parameters

4. GWC

The Gateway Controller (GWC) is managed via the CS2K Management Tool (CMT): Sun workstation hosted Nortel OAM application. The following setup will be executed by the hosting Telco and not in the domain of the Enterprise.

The configuration steps are self-explanatory; additional comments have been added to highlight key input.

For further information, please refer to NN10205-511 version 05.02 Gateway Controller Configuration Management located on http://nortel.com/helmsman online repository for Packet Trunking - IP SN07 Standard (PTIP07).

4.1 Adding GWC in CMT

Follow pages 99-106 of the NTP NN10205-511. This section lists all the required information to add a GWC in CMT.

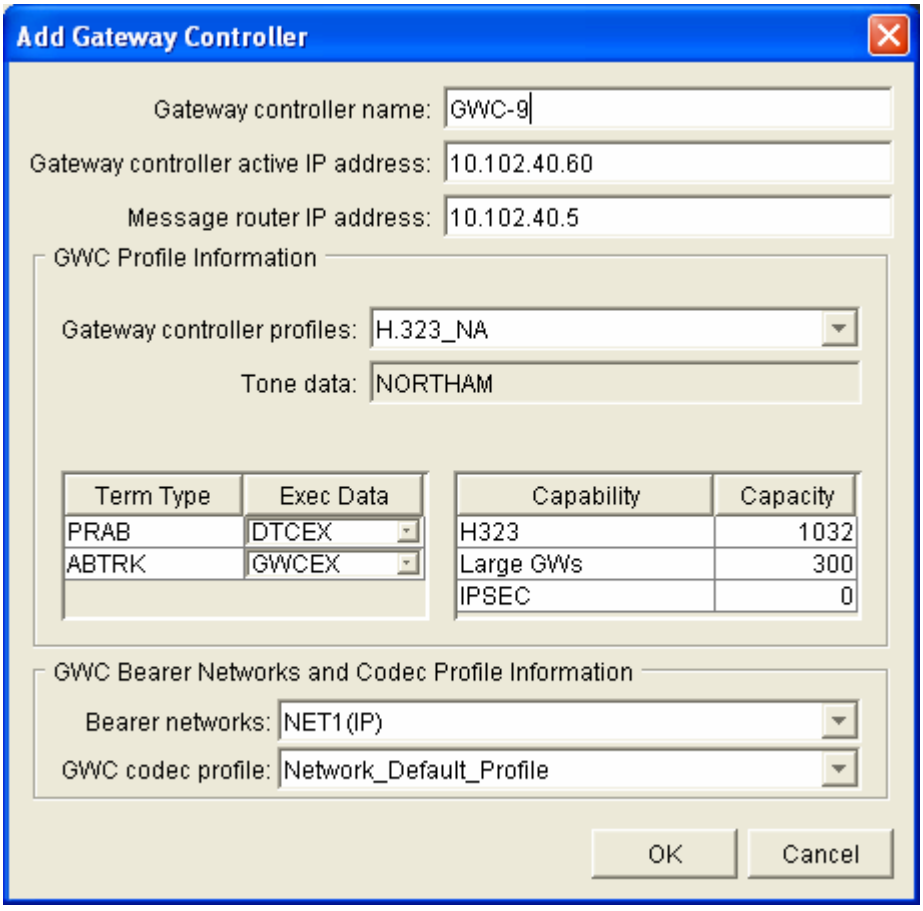

Figure 19: GWC – Add GWC

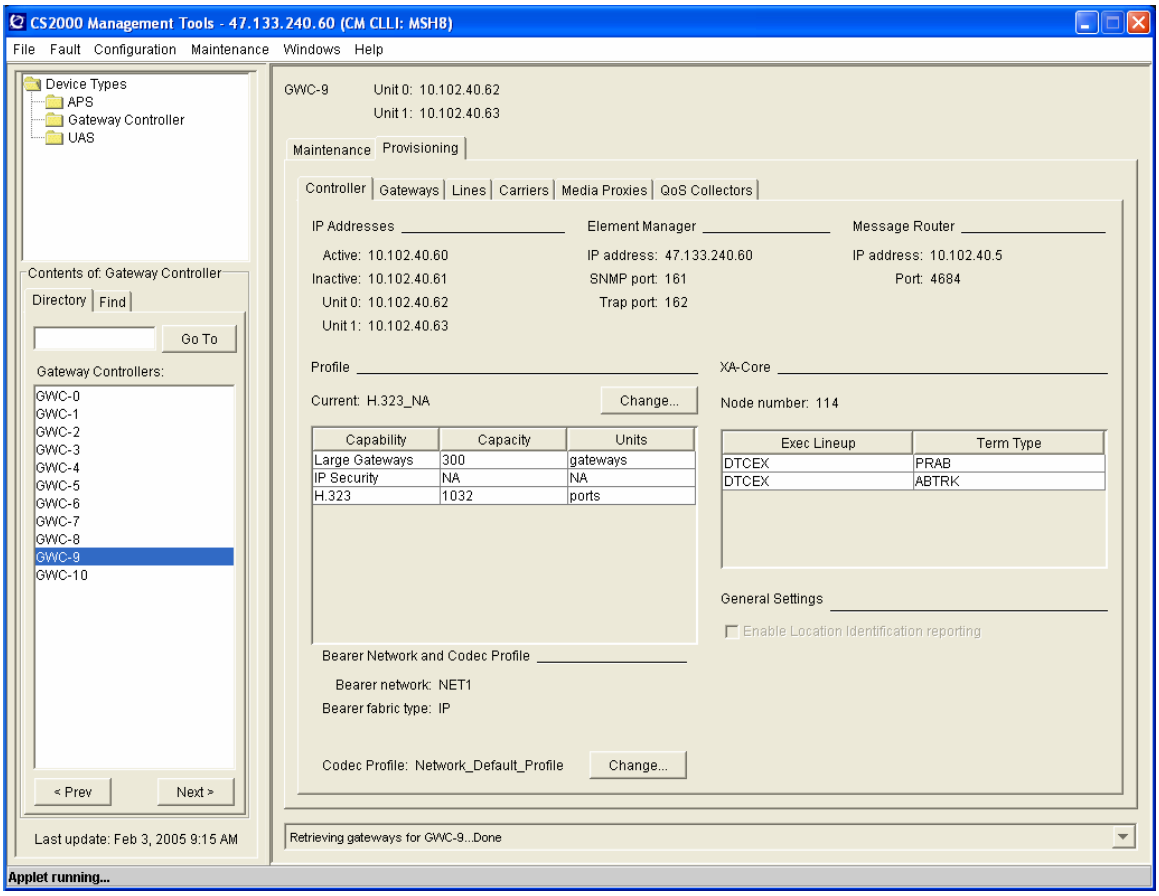

Figure 20: GWC – Provisioning

4.2 Associating H323 Gateway to GWC in CMT

Following the procedures documented in pages 147-156 of the NTP NN10205-511, a H323 Gateway is associated to a GWC in the following manner:

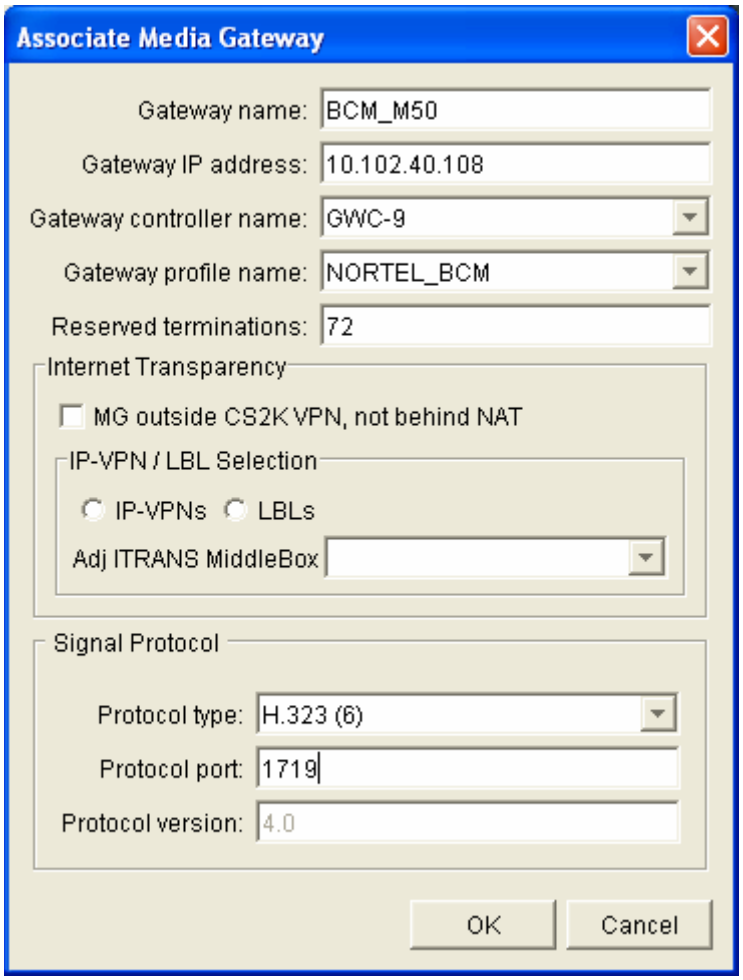

Figure 21: GWC – Associate Media Gateway

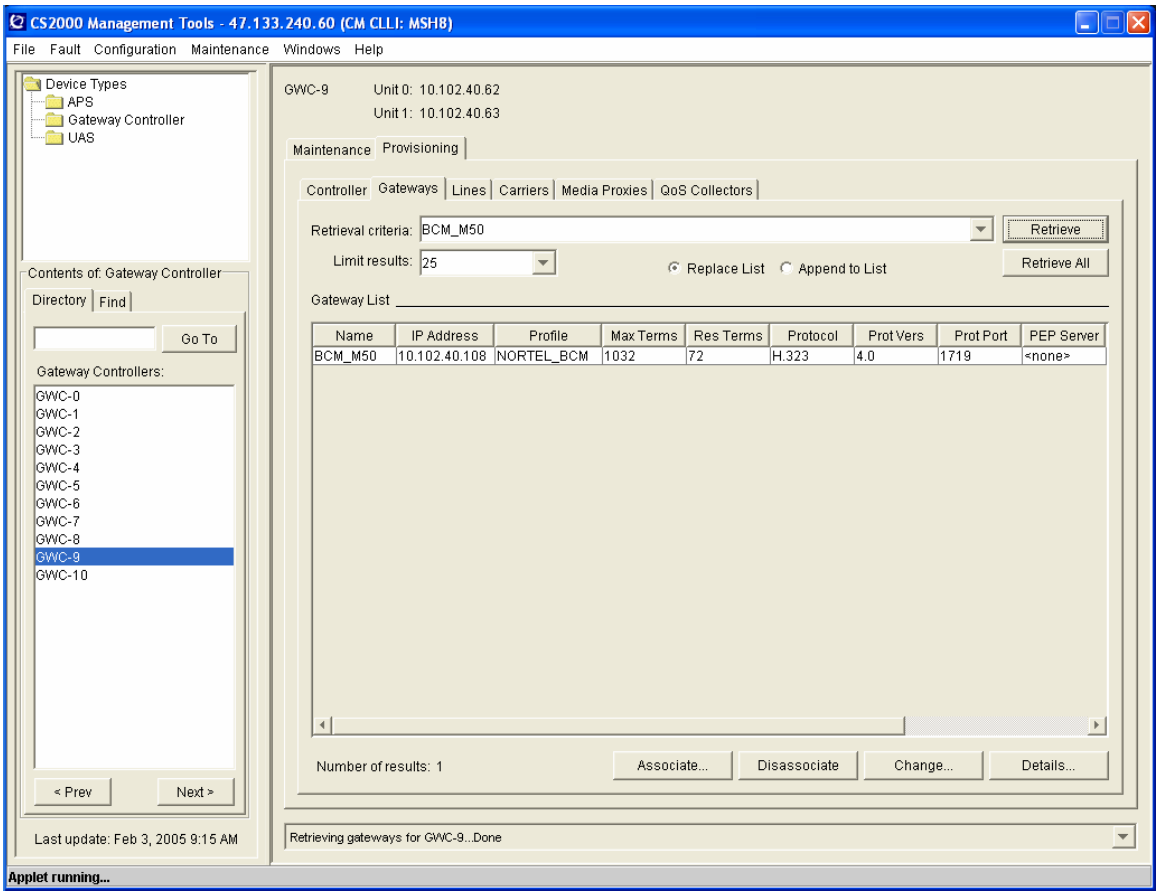

Figure 22: GWC – Provisioning Gateway

4.3 Reserving H323 Carriers on H323 Gateway in CMT

Once the Gateway is associated to the GWC, the next step is to set up the H.323 carriers. Refer to pages 169-191 of the NTP NN10205-511.

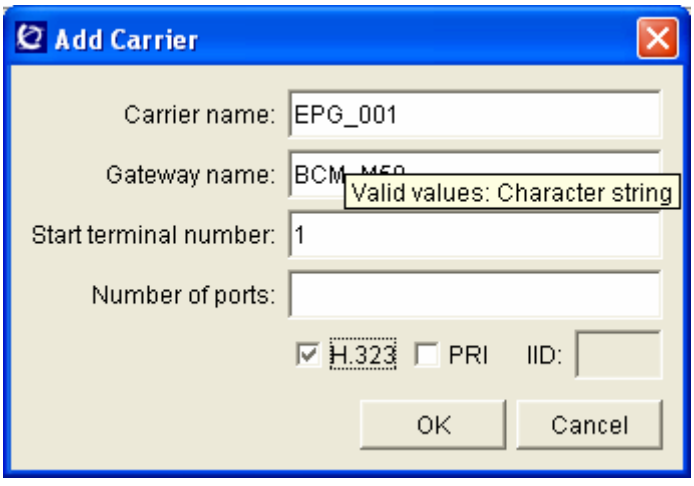

Figure 23: GWC – Add Carrier

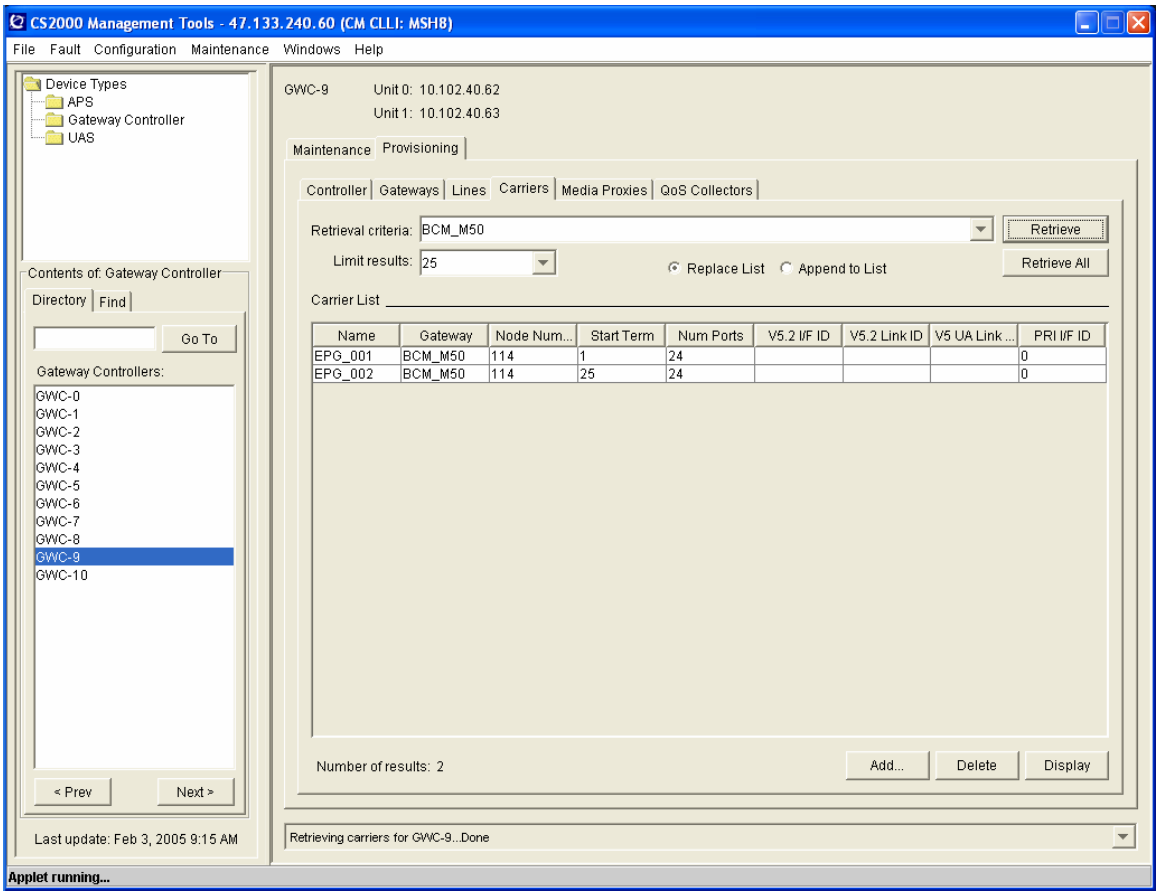

Figure 24 GWC – Carriers

4.4 Configuring Voice Network Settings

The final step in configuring the GWC is to ensure that sampling rate is correctly configured. Succession's CS2K supports 10 or 20 millisecond (mS) sampling; the IW-SPM the GWC and the BCM50 need to be set to the same value.

Details on the IW-SPM setup can be found in 1 ; the GWC details follow pages 20-27 of the NTP NN10205-511.

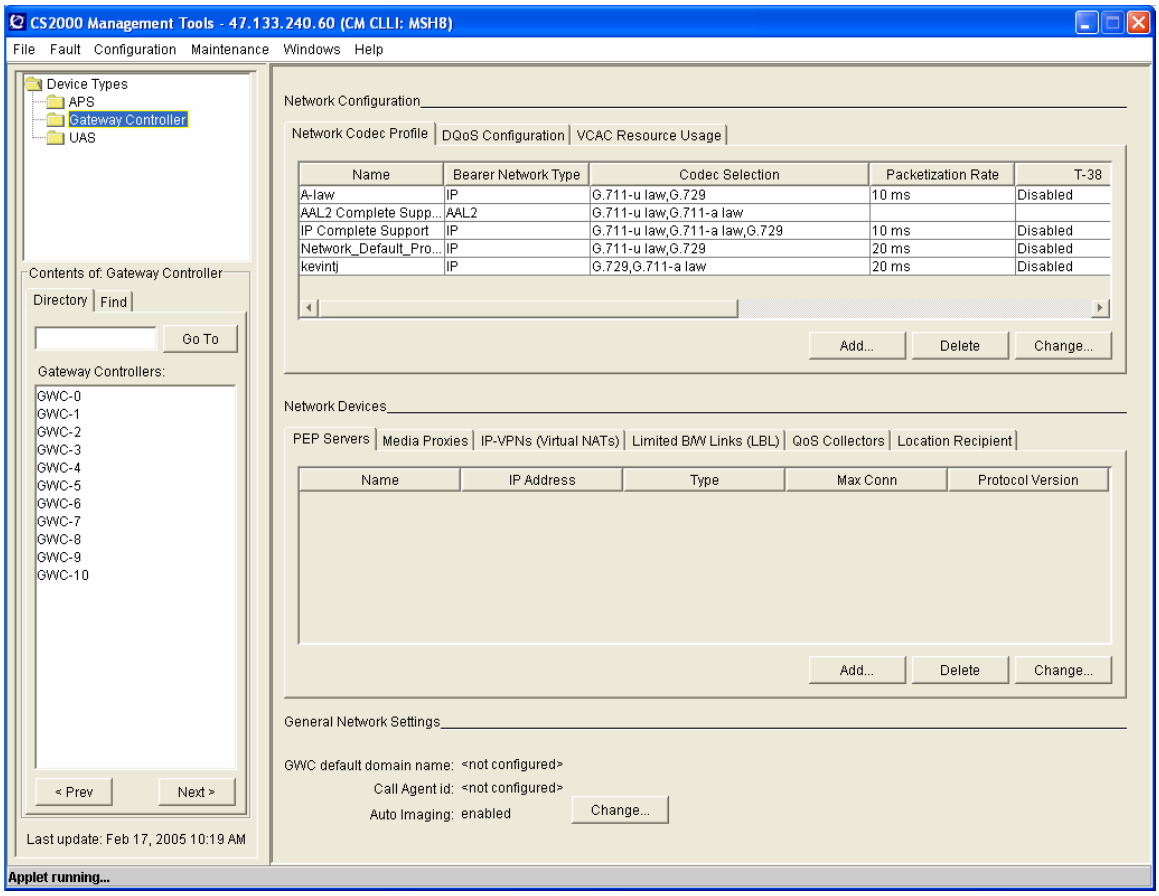

Figure 25: GWC Packet Level Main Screen

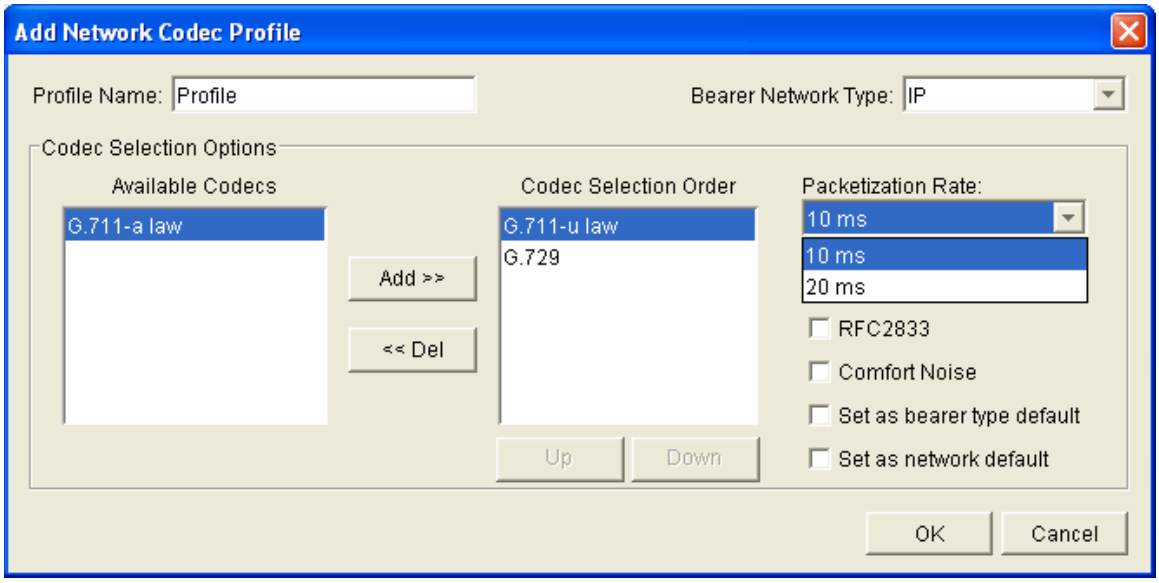

Figure 26: Packetization Rate Selection

5. Appendix A: DMS Read Files

5.1.1 Translation Verification (Traver)

The traver tool runs through the CS2K translations in the same order as the call processing software. Thus, by reviewing the attached travered calls, the reader can get a feel for the method by which the calls to and from the BCM are routed.

5.1.1.1 Debug Note

It is highly recommended that all call debugging be executed while closely observing the DMS logs; as a successful Traver does not necessarily indicate that calls are completing.

5.1.1.2 CS2K DN to BCM

Line to line call: CS2K DN 234-4025 to BCM2_M50 236-4353.

```
Traver l 2344025 2364353 b
TABLE IBNLINES
HOST 00 0 00 12 0 DT STN IBN 2344025 EO613 0 0 613 $
TABLE DNATTRS
TUPLE NOT FOUND
TABLE DNGRPS
TUPLE NOT FOUND
TABLE IBNFEAT
TUPLE NOT FOUND
TABLE CUSTSTN
EO613 AIN AIN TIID
TABLE OFCVAR
AIN_OFFICE_TRIGGRP TIID
AIN Orig Attempt TDP: no subscribed trigger.
TABLE NCOS
EO613 0 0 0 EO613 ( XLAS EO613XLA EO613FT NDGT) ( ERWT )$
TABLE CUSTHEAD: CUSTGRP, PRELIMXLA, CUSTXLA, FEATXLA, VACTRMT, AND
DIGCOL
EO613 NXLA EO613XLA EO613FT 0 NDGT
TABLE DIGCOL
NDGT specified: digits collected individually
TABLE IBNXLA: XLANAME EO613XLA
TUPLE NOT FOUND
Default from table XLANAME:
EO613XLA
    (NET N N 0 N POTS N N GEN ( LATTR 3 613_OTTPUB_3 EA613_1)
    (EA NILC Y 0) $ $)$ 9
TABLE DIGCOL
POTS specified: POTS digit collection
TABLE LINEATTR
3 1FR NONE NT 3 0 NILSFC 0 NIL NIL 00 613_OTTPUB_3 EA613_1 $
LCABILL OFF - BILLING DONE ON BASIS OF CALLTYPE
TABLE XLAPLAN
613_OTTPUB_3 NSCR 613 OTTPUB NONE Y EO613 0 0 $ $
TABLE RATEAREA
EA613_1 NLCA NIL EA613 $
TABLE STDPRTCT
OTTPUB ( 1) ( 0) 4
 . SUBTABLE STDPRT
 . KEY NOT FOUND
```

```
 . DEFAULT VALUE IS:   N NP 0 NA
 . SUBTABLE AMAPRT
 . KEY NOT FOUND
 . DEFAULT VALUE IS:   NONE OVRNONE  N
TABLE HPCPATTN
TUPLE NOT FOUND
TABLE HNPACONT
613 Y 1023 0 ( 237) ( 1) ( 0) ( 0) 0 $
 . SUBTABLE HNPACODE
 . 236 236 LRTE 56
 . SUBTABLE RTEREF
 .   56 T OFRT 551
 .  . TABLE OFRT
 .  .  551 N D BCM2_M50 0 N N
 .  . EXIT TABLE OFRT
 . EXIT TABLE RTEREF
EXIT TABLE HNPACONT
LNP Info: Called DN is not resident.
LNP Info: HNPA results are used.
AIN Info Collected TDP: no subscribed trigger.
TABLE FNPA7DIG
EMPTY TABLE: TUPLE NOT FOUND
Checking AIN SDS Trigger Items as SDS is compatible with current call
AIN Info Analyzed TDP: trigger criteria not met.

+++ TRAVER: SUCCESSFUL CALL TRACE +++


DIGIT TRANSLATION ROUTES

1 BCM2_M50                    N CDN  E164  L  2364353 NIL_NSF   BC
SPEECH

TREATMENT ROUTES.  TREATMENT IS: GNCT
1 VCA

+++ TRAVER: SUCCESSFUL CALL TRACE +++
```

5.1.1.3 BCM Trunk to CS2K DN

Incoming to the CS2K from the BCM2_M50's trunk to the CS2K DN 234-4025.

```
traver tr BCM2_M50 2344025 b
TABLE TRKGRP
BCM2_M50 PRA 0 NPDGP NCRT MIDL N (ISDN 551) $ $
TABLE LTCALLS
ISDN 551 PUB XLALEC 0 BCM_PRI_TRAF NLCA_NILLA_0 $
TABLE CUSTSTN
TUPLE NOT FOUND
TABLE OFCVAR
AIN_OFFICE_TRIGGRP TIID
TABLE LINEATTR
0 IBN NONE NT 0 0 NILSFC 0 NIL NIL 00 613_NPRT_0 NLCA_NILLA_0 $

LCABILL OFF - BILLING DONE ON BASIS OF CALLTYPE
```

```
TABLE XLAPLAN
BCM_PRI_TRAF NSCR 550 PRI_TRAF NONE N $ PRI_TRAFFIC
TABLE RATEAREA
NLCA_NILLA_0 NLCA NIL NILLATA $
TABLE STDPRTCT
PRI_TRAF ( 0) ( 0) 5
 . SUBTABLE STDPRT
WARNING: CHANGES IN TABLE STDPRT MAY ALTER OFFICE
BILLING.  CALL TYPE DEFAULT IS NP.  PLEASE REFER TO
DOCUMENTATION.
 . KEY NOT FOUND
 . DEFAULT VALUE IS:   N NP 0 NA
 . SUBTABLE AMAPRT
 . KEY NOT FOUND
 . DEFAULT VALUE IS:   NONE OVRNONE  N
TABLE HPCPATTN
TUPLE NOT FOUND
TABLE HNPACONT
550 Y 700 0 ( 2) ( 1) ( 0) ( 0) 3 $
 . SUBTABLE HNPACODE
 . 234 234 DN 613 234
TABLE TOFCNAME
613 234 $
TABLE DNINV
613 234 4025 L HOST 00 0 00 12
TABLE DNFEAT
TUPLE NOT FOUND
TABLE DNATTRS
TUPLE NOT FOUND
TABLE DNGRPS
TUPLE NOT FOUND
LNP Info: Called DN is resident.
LNP Info: Called DN has native NPANXX.
LNP Info: HNPA results are used.
AIN Info Collected TDP: no subscribed trigger.
Checking AIN SDS Trigger Items as SDS is compatible with current call
AIN Info Analyzed TDP: trigger criteria not met.
AIN Term Attempt TDP: no subscribed trigger.

+++ TRAVER: SUCCESSFUL CALL TRACE +++


DIGIT TRANSLATION ROUTES

1 LINE                  6132344025         ST

TREATMENT ROUTES.  TREATMENT IS: GNCT
1 VCA

+++ TRAVER: SUCCESSFUL CALL TRACE +++
```

5.1.1.4 Inter-BCM Call

The first leg of the call originates as a trunk (BCM2_M50) which is first dialing the office code of 550, then BCM_M50's DN 235-4353.

```
>traver tr bcm2_m50 5502354353 b
TABLE TRKGRP
BCM2_M50 PRA 0 NPDGP NCRT MIDL N (ISDN 551) $ $
TABLE LTCALLS
ISDN 551 PUB XLALEC 0 BCM_PRI_TRAF NLCA_NILLA_0 $
TABLE CUSTSTN
TUPLE NOT FOUND
TABLE OFCVAR
AIN_OFFICE_TRIGGRP TIID
TABLE LINEATTR
0 IBN NONE NT 0 0 NILSFC 0 NIL NIL 00 613_NPRT_0 NLCA_NILLA_0 $
LCABILL OFF - BILLING DONE ON BASIS OF CALLTYPE
TABLE XLAPLAN
BCM_PRI_TRAF NSCR 550 PRI_TRAF NONE N $ PRI_TRAFFIC
TABLE RATEAREA
NLCA_NILLA_0 NLCA NIL NILLATA $
TABLE STDPRTCT
PRI_TRAF ( 0) ( 0) 5
 . SUBTABLE STDPRT
WARNING: CHANGES IN TABLE STDPRT MAY ALTER OFFICE
BILLING.  CALL TYPE DEFAULT IS NP.  PLEASE REFER TO
DOCUMENTATION.
 . KEY NOT FOUND
 . DEFAULT VALUE IS:   N NP 0 NA
 . SUBTABLE AMAPRT
 . KEY NOT FOUND
 . DEFAULT VALUE IS:   NONE OVRNONE  N
TABLE HPCPATTN
TUPLE NOT FOUND
TABLE HNPACONT
550 Y 700 0 ( 2) ( 1) ( 0) ( 0) 3 $
 . SUBTABLE HNPACODE
 . 550235 550235 FRTE 550
 . SUBTABLE RTEREF
 .  550 T OFRT 550
 .  . TABLE OFRT
 .  .  550 N D BCM_M50 0 N N
 .  . EXIT TABLE OFRT
 . EXIT TABLE RTEREF
EXIT TABLE HNPACONT
LNP Info: Called DN is not resident.
LNP Info: HNPA results are used.
AIN Info Collected TDP: no subscribed trigger.
Checking AIN SDS Trigger Items as SDS is compatible with current call
AIN Info Analyzed TDP: trigger criteria not met.


+++ TRAVER: SUCCESSFUL CALL TRACE +++


DIGIT TRANSLATION ROUTES

1 BCM_M50                    N CDN  E164  NA  5502354353 NIL_NSF   BC
SPEECH


TREATMENT ROUTES.  TREATMENT IS: GNCT
```

```
1 VCA

+++ TRAVER: SUCCESSFUL CALL TRACE +++
```

6. Appendix B: DMS CLLIREF

The CLLIREF tool scans all CS2K tables for instances of a specific CLLI. The output of the BCM_M50 CLLIREF is included to ensure that no tables were omitted from this document.

```
>clliref search BCM_M50
CLLI "BCM_M50" occurs in the following tuples:
Table     Key: Sub  Tuple
--------  -------> ------------------------------------------------
-----
CLLI                BCM_M50 411 50 PIERRE_FOURNIER
TRKGRP              BCM_M50 PRA 0 NPDGP NCRT MIDL N (ISDN 550) $ $
CLLIMTCE            BCM_M50 BCM_M5 5 10 15 NSS 0 0 N N (4)
OFRT                550 (N D BCM_M50 0 N N) $ $
TRKSGRP             BCM_M50 0 DS1SIG ISDN 20 20 87Q931 2 N STAND
NETWORK
                         PT_PT USER N UNEQ 160 N DEFAULT GWC 9 114 1
64K
                         HDLC $ $
TRKMEM              BCM_M50 1 0 GWC 9 114 2
TRKMEM              BCM_M50 2 0 GWC 9 114 3
TRKMEM              BCM_M50 3 0 GWC 9 114 4
TRKMEM              BCM_M50 4 0 GWC 9 114 5
TRKNAME             411 BCM_M50
LTMAP               ISDN 550 CLLI BCM_M50 (TEI 0) $
=====================
Total of           11

>clliref search BCM2_M50
CLLI "BCM2_M50" occurs in the following tuples:
Table     Key: Sub  Tuple
--------  -------> ------------------------------------------------
-----
CLLI                BCM2_M50 413 50 PIERRE_FOURNIER
TRKGRP              BCM2_M50 PRA 0 NPDGP NCRT MIDL N (ISDN 551) $ $
CLLIMTCE            BCM2_M50 BCM2_M 5 10 15 NSS 0 0 N N (4)
OFRT                551 (N D BCM2_M50 0 N N) $ $
TRKSGRP             BCM2_M50 0 DS1SIG ISDN 20 20 87Q931 2 N STAND
NETWORK
                         PT_PT USER N UNEQ 160 N DEFAULT GWC 9 114 49
64K
                         HDLC $ $
TRKMEM              BCM2_M50 1 0 GWC 9 114 50
TRKMEM              BCM2_M50 2 0 GWC 9 114 51
TRKMEM              BCM2_M50 3 0 GWC 9 114 52
TRKMEM              BCM2_M50 4 0 GWC 9 114 53
TRKNAME             413 BCM2_M50
LTMAP               ISDN 551 CLLI BCM2_M50 (TEI 0) $
=====================
Total of           11
Occurrences of BCM2_M50
```

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