



Nortel SL100 PBX using T1 DMS100 to Cisco Unified CallManager 4.1

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Table of Contents

Introduction	1
Network Topology.....	2
Limitations.....	2
System Components	2
Features	3
Features Supported.....	3
Features Not Supported	3
Configuration.....	4
Configuring the Nortel SL100 PBX	4
Configuring the Cisco Call Manager.....	12
Configuring the Cisco 3725 MGCP gateway:	12
Acronyms	13

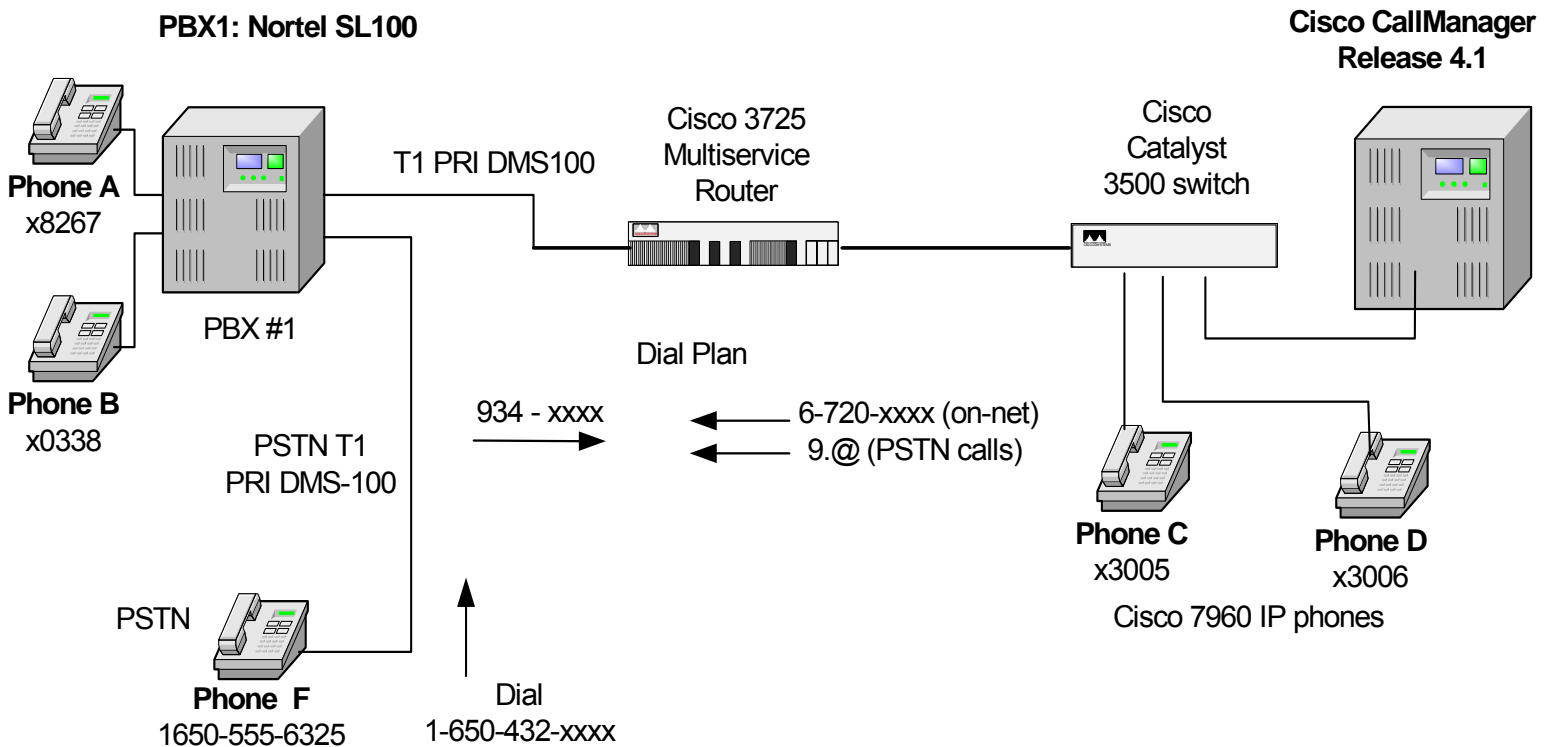
Introduction

- This is an application note for connectivity of Nortel SL100 PBX with Cisco Unified CallManager Release 4.1 using Cisco 3725 MGCP gateway with T1 PRI DMS-100 ISDN switch-type.
- The network topology diagram (Figure 1) shows the test setup for end-to-end interoperability with the Cisco Unified CallManager connected to the PBX via Cisco 3725 MGCP gateway with T1 PRI DMS-100 link.
- This Application Note uses the 3725-T1 voice gateway, however other Cisco voice gateways can also be option since Cisco Unified CallManager PRI DMS-100 switch-type implementation does not depend on the type of voice gateway used

Network Topology

Figure 1. Basic Call Setup

Basic Call Setup End-to-End Configuration



Limitations

System Components

Hardware Requirements

Cisco Hardware:

- Cisco Catalyst 3500 switch
- Cisco 3725 voice gateway with NM-HDV-2MFT-T1 network module



- Cisco Unified CallManager 4.1

Nortel DMS-100 Hardware:

- SL100 switch Hardware Version 6x50ab

Software Requirements

Nortel SL-100 Software Version ISD00023

Cisco Unified CallManager 4.1

Features

This section lists new and changed features and features that are not supported.

Features Supported

- CLIP-Calling Line (Number) Identification Presentation
- CLIR-Calling Line (Number) Identification Restriction
- CNIP-Calling Name Identification Presentation
- CNIR-Calling Name Identification Restriction
- COLP-Connected Line (Number) Identification Presentation
- COLR- Connected Line (Number) Identification Restriction
- CONP-Connected Name Identification Presentation
- CONR- Connected Name Identification Restriction
- Sending Alerting Name
- CT-Call Transfer (by join)
- CFU-Call Forwarding Unconditional (by join)
- CFB-Call Forwarding Busy (by join)
- CFNR-Call Forwarding No Reply (by join)

Features Not Supported

None



Configuration

Configuring the Nortel SL100 PBX

PRI Programming to Cisco Call Manager:

PROGRAMMING

CLLI "CALLMGR" occurs in the following tuples:

Table	Key:	Sub	Tuple
CLLI			CALLMGR 171 23 T1_TO_CISCO_CALL_MGR
TRKGRP			CALLMGR IBNT2 0 PRAC NCRT VISA_OCW 0 CCWCTH 240 N ANSDISC 0 Y N N N N N Y 0 0 N 0 0 0 0 N N N N N N N N N NATL (LTID PRITRK 24) \$
CLLIMTCE			CALLMGR CALLMG 5 10 15 NSS 0 0 N N (23)
IBNRTE			235 (ISA N N N CALLMGR N PVT 1 PVT 235) \$ \$
IBNRT3			235 (ISA N N N CALLMGR N PVT 1 PVT 2) \$ \$
TRKSGRP			CALLMGR 0 DS1SIG ISDN 8 12 87Q931 2 N STAND NETWORK PT_PT USER N UNEQ 7 Y CPND LTC 2 4 24 64K HDLC \$ \$
TRKMEM			CALLMGR 1 0 LTC 2 4 1
TRKMEM			CALLMGR 2 0 LTC 2 4 2
TRKMEM			CALLMGR 3 0 LTC 2 4 3
TRKMEM			CALLMGR 4 0 LTC 2 4 4
TRKMEM			CALLMGR 5 0 LTC 2 4 5
TRKMEM			CALLMGR 6 0 LTC 2 4 6
TRKMEM			CALLMGR 7 0 LTC 2 4 7
TRKMEM			CALLMGR 8 0 LTC 2 4 8
TRKMEM			CALLMGR 9 0 LTC 2 4 9
TRKMEM			CALLMGR 10 0 LTC 2 4 10
TRKMEM			CALLMGR 11 0 LTC 2 4 11
TRKMEM			CALLMGR 12 0 LTC 2 4 12
TRKMEM			CALLMGR 13 0 LTC 2 4 13
TRKMEM			CALLMGR 14 0 LTC 2 4 14
TRKMEM			CALLMGR 15 0 LTC 2 4 15
TRKMEM			CALLMGR 16 0 LTC 2 4 16
TRKMEM			CALLMGR 17 0 LTC 2 4 17
TRKMEM			CALLMGR 18 0 LTC 2 4 18
TRKMEM			CALLMGR 19 0 LTC 2 4 19
TRKMEM			CALLMGR 20 0 LTC 2 4 20
TRKMEM			CALLMGR 21 0 LTC 2 4 21
TRKMEM			CALLMGR 22 0 LTC 2 4 22
TRKMEM			CALLMGR 23 0 LTC 2 4 23
TRKNAME			171 CALLMGR
LTMAP			PRITRK 24 CLLI CALLMGR (TEI 0) \$
=====			
Total of			31
occurrences of CALLMGR			
TABLE: LTDEF			
PRITRK	24	B	
PRA	24	NTNAPRI V1	SL1PROFL (NOPMD) \$



ROUTING

TABLE: LTCALLS

LTID XLARTSEL OPTIONS

PRITRK 24 PUB XLAIBN 18 CCSA_SP18 NLCA_NIL VISA_OCW 0 240 \$
PRITRK 24 PVT XLAIBN 18 CCSA_SP18 NLCA_NIL VISA_OCW 0 240 \$
PRITRK 24 TIE XLAIBN 2 NSCR_TRK NLCA_NIL VISA_OCW 0 240 \$

TABLE: STDPRTCT

>pos sp18
SP18 (1) (0)

>sub stdprt
TOP
FROMDIGS TODIGS PRETRTE

2 5 N NP 0 NA
6 6 T NP 0 IBNRTE 34 8 8 NONE
90 90 T DD 0 IBNRT4 2 7 12 NONE
91 91 T DD 0 IBNRT4 7 7 12 NONE
92 99 T DD 0 IBNRT4 2 7 12 NONE
BOTTOM

Dial Plan for Call Manager to PBX and vice versa:

1. Call Manager to local PSTN via the SL100 PBX:

>traver tr callmgr 95040011 b
TABLE TRKGRP
CALLMGR IBNT2 0 PRAC NCRT VISA_OCW 0 CCWCTH 240 N ANSDISC 0 Y N N N N N Y 0 0 N
0 0 0 0 N N N N N N N N N NATL (LTID PRITRK 24) \$
TABLE LTCALLS
PRITRK 24 PUB XLAIBN 18 CCSA_SP18 NLCA_NIL VISA_OCW 0 240 \$
TABLE CUSTSTN
TUPLE NOT FOUND
TABLE OFCVAR
AIN_OFFICE_TRIGGRP NIL
TABLE LINEATTR
18 IBN NONE NT 0 0 NILSFC 0 NIL NIL 00 CCSA_SP18 NLCA_NIL \$
LCABILL OFF - BILLING DONE ON BASIS OF CALLTYPE
TABLE XLAPLAN
CCSA_SP18 CCSA 650 SP18 AMRX N \$ \$
TABLE RATEAREA
NLCA_NIL NLCA NIL NILLATA \$
TABLE STDPRTCT
SP18 (1) (0) 1
. SUBTABLE STDPRT
WARNING: CHANGES IN TABLE STDPRT MAY ALTER OFFICE
BILLING. CALL TYPE DEFAULT IS NP. PLEASE REFER TO
DOCUMENTATION.
. 95 99 T DD 0 IBNRT4 2 7 12 NONE



```

. . TABLE IBNRT4
. . 2 ISA N N N SBC_4 N PUB NONE 0 N 915
. . . TABLE TRKGRP
. . . SBC_4 IBNT2 0 PRAC NCRT VISA_OCW 0 MIDL 201 N ANSDISC 0 Y N N N N N Y 0 201 N
0
. . . 0 0 1 N N N N N N N N NATL (LTID PRITRK 11) $
. . . TABLE LTCALLS
. . . PRITRK 11 PUB XLAIBN 2 NSCR_TRK NLCA_NIL VISA_OCW 0 201 $
. . . TABLE DIGMAN
. . . 915 (REM 1) (INC 1650)
. . . EXIT TABLE DIGMAN
. . EXIT TABLE IBNRT4
. SUBTABLE AMAPRT
. KEY NOT FOUND
. DEFAULT VALUE IS: NONE OVRNONE N
LNP00100 SOC Option is IDLE.
AIN Info Collected TDP: no subscribed trigger.
AIN Info Analyzed TDP: no subscribed trigger.

```

+++ TRAVER: SUCCESSFUL CALL TRACE +++

DIGIT TRANSLATION ROUTES

1 SBC_4 **N CDN E164 IN 16505040011 NIL_NSF BC SPEECH**
 Outpulsing on this route is modified by the following options:
 (DNIS)

TREATMENT ROUTES. TREATMENT IS: GNCT
 1 T120

+++ TRAVER: SUCCESSFUL CALL TRACE +++

2. Call Manager to long distance PSTN via the SL100 PBX:

```

>traver tr callmgr 914088346132 b
TABLE TRKGRP
CALLMGR IBNT2 0 PRAC NCRT VISA_OCW 0 CCWCTH 240 N ANSDISC 0 Y N N N N N Y 0 0 N
0 0 0 0 N N N N N N N N NATL (LTID PRITRK 24) $
TABLE LTCALLS
PRITRK 24 PUB XLAIBN 18 CCSA_SP18 NLCA_NIL VISA_OCW 0 240 $
TABLE CUSTSTN
TUPLE NOT FOUND
TABLE OFCVAR
AIN_OFFICE_TRIGGRP NIL
TABLE LINEATTR
18 IBN NONE NT 0 0 NILSFC 0 NIL NIL 00 CCSA_SP18 NLCA_NIL $
LCABILL OFF - BILLING DONE ON BASIS OF CALLTYPE
TABLE XLAPLAN
CCSA_SP18 CCSA 650 SP18 AMRX N $ $
TABLE RATEAREA
NLCA_NIL NLCA NIL NILLATA $
TABLE STDPRTCT

```



```

SP18 ( 1) ( 0) 1
. SUBTABLE STDPRT
WARNING: CHANGES IN TABLE STDPRT MAY ALTER OFFICE
BILLING. CALL TYPE DEFAULT IS NP. PLEASE REFER TO
DOCUMENTATION.
. 91 91 T DD 0 IBNRT4 7 7 12 NONE
. . TABLE IBNRT4
. . . 7 ISA N N N SBC_4 N PUB NONE 0 N 917
. . . TABLE TRKGRP
. . . SBC_4 IBNT2 0 PRAC NCRT VISA_OCW 0 MIDL 201 N ANSDISC 0 Y N N N N N Y 0 201 N
0
. . . 0 0 1 N N N N N N N NATL (LTID PRITRK 11) $
. . . TABLE LTCALLS
. . . PRITRK 11 PUB XLAIBN 2 NSCR_TRK NLCA_NIL VISA_OCW 0 201 $
. . . TABLE DIGMAN
. . . 917 (REM 1)
. . . EXIT TABLE DIGMAN
. . EXIT TABLE IBNRT4
. SUBTABLE AMAPRT
. KEY NOT FOUND
. DEFAULT VALUE IS: NONE OVRNONE N
LNP00100 SOC Option is IDLE.
AIN Info Collected TDP: no subscribed trigger.
AIN Info Analyzed TDP: no subscribed trigger.

```

+++ TRAVER: SUCCESSFUL CALL TRACE +++

DIGIT TRANSLATION ROUTES

```

1 SBC_4 N CDN E164 IN 14088346132 NIL_NSF BC SPEECH
Outputpulsing on this route is modified by the following options:
(DNIS)

```

```

TREATMENT ROUTES. TREATMENT IS: GNCT
1 T120

```

+++ TRAVER: SUCCESSFUL CALL TRACE +++

3. Call Manager to extension off the SL100 PBX (on-net call):

```

>traver tr callmgr 67208999 b
TABLE TRKGRP
CALLMGR IBNT2 0 PRAC NCRT VISA_OCW 0 CCWCTH 240 N ANSDISC 0 Y N N N N N Y 0 0 N
0 0 0 0 N N N N N N N N NATL (LTID PRITRK 24) $
TABLE LTCALLS
PRITRK 24 PUB XLAIBN 18 CCSA_SP18 NLCA_NIL VISA_OCW 0 240 $
TABLE CUSTSTN
TUPLE NOT FOUND
TABLE OFCVAR
AIN_OFFICE_TRIGGRP NIL
TABLE LINEATTR
18 IBN NONE NT 0 0 NILSFC 0 NIL NIL 00 CCSA_SP18 NLCA_NIL $

```



LCABILL OFF - BILLING DONE ON BASIS OF CALLTYPE

TABLE XLAPLAN

CCSA_SP18 CCSA 650 SP18 AMRX N \$ \$

TABLE RATEAREA

NLCA_NIL NLCA NIL NILLATA \$

TABLE STDPRTCT

SP18 (1) (0) 1

. **SUBTABLE STDPRT**

WARNING: CHANGES IN TABLE STDPRT MAY ALTER OFFICE BILLING. CALL TYPE DEFAULT IS NP. PLEASE REFER TO DOCUMENTATION.

. 6 6 T NP 0 IBNRTE 34 8 8 NONE

. . **TABLE IBNRTE**

. . 34 RX VISA_OCW 0 11 2 \$

. . . **TABLE DIGMAN**

. . . 2

. . . EXIT TABLE DIGMAN

. . EXIT TABLE IBNRTE

. SUBTABLE AMAPRT

. KEY NOT FOUND

. DEFAULT VALUE IS: NONE OVRNONE N

LNP00100 SOC Option is IDLE.

AIN Info Collected TDP: no subscribed trigger.

AIN Info Analyzed TDP: no subscribed trigger.

+++ TRAVER: SUCCESSFUL CALL TRACE +++

DIGIT TRANSLATION ROUTES

1 LINE 6504328999 ST

TREATMENT ROUTES. TREATMENT IS: GNCT

1 T120

+++ TRAVER: SUCCESSFUL CALL TRACE +++

4. SL100 PBX call to Cisco Call Manager extension:

>traver 1 4328999 3004 b

TABLE KSETLINE

MTRO 04 0 11 14 1 MDN SCA 0 Y Y 4328999 VISA_OCW 0 17 650 (3WC) (LNR) (KSH)
(AUTODISP) (CFX) (MWT) \$ IVD

TABLE DNATTRS

650 432 8999

(PUBLIC (NAME NEXTIRAONE) (MEMDISP) (NONUNIQUE) \$)

(PRIVATE (NAME NEXTIRAONE) (MEMDISP) (NONUNIQUE) \$)\$ \$

TABLE DNGRPS

650 432 8999 8999

(PUBLIC (ADDRESS 650 432 NNNN) \$)

(PRIVATE (ADDRESS DDD 720 NNNN) \$)\$

TABLE KSETFEAT

TUPLE NOT FOUND



TABLE CUSTSTN

TUPLE NOT FOUND

TABLE OFCVAR

AIN_OFFICE_TRIGGRP NIL

AIN Orig Attempt TDP: no subscribed trigger.

TABLE NCOS

VISA_OCW 17 0 0 CONFRM (XLAS PT17 NXLA NDGT) (CRL 1 BLOCKED)\$

TABLE CUSTHEAD: CUSTGRP, PRELIMXLA, CUSTXLA, FEATXLA, VACTRMT, AND DIGCOL

VISA_OCW CPT1 CT1 FT1 0 DGT1

TABLE DIGCOL

DGT1 3 COL S 3

TABLE IBNXLA: XLANAME PT17

TUPLE NOT FOUND

Default is to go to next XLA name.

TABLE IBNXLA: XLANAME CPT1

TUPLE NOT FOUND

Default is to go to next XLA name.

TABLE IBNXLA: XLANAME CT1

CT1 30 EXTN N Y 650 432 4 \$ \$

TABLE TOFCNAME

650 432 \$

TABLE DNINV

650 432 3004 T IBNRTE 235

TABLE DNFEAT

TUPLE NOT FOUND

TABLE DNATTRS

TUPLE NOT FOUND

TABLE DNGRPS

650 432 3004 3004

(PUBLIC (ADDRESS 650 432 NNNN) \$)

(PRIVATE (ADDRESS DDD 720 NNNN) \$)\$

. **TABLE IBNRTE**

. 235 ISA N N N CALLMGR N PVT 1 PVT 235

. . **TABLE TRKGRP**

. . CALLMGR IBNT2 0 PRAC NCRT VISA_OCW 0 CCWCTH 240 N ANSDISC 0 Y N N N N N Y 0 0 N

. . 0 0 0 0 N N N N N N N N NATL (LTID PRITRK 24) \$

. . **TABLE LTCALLS**

. . PRITRK 24 PVT XLAIBN 18 CCSA_SP18 NLCA_NIL VISA_OCW 0 240 \$

. . **TABLE DIGMAN**

. . 235 (INC 934)

. . EXIT TABLE DIGMAN

. EXIT TABLE IBNRTE

AIN Info Collected TDP: no subscribed trigger.

AIN Info Analyzed TDP: no subscribed trigger.

AIN Term Attempt TDP: no subscribed trigger.

+++ TRAVER: SUCCESSFUL CALL TRACE +++

DIGIT TRANSLATION ROUTES

1 CALLMGR

N CDN PVT L 9343004 PRVT 1 BC SPEECH

Outpulsing on this route is modified by the following options:

(DNIS)



TREATMENT ROUTES. TREATMENT IS: GNCT
1 T120

+++ TRAVER: SUCCESSFUL CALL TRACE +++

5. PSTN call to SL100 PBX to Cisco Call Manager extension:

```
>traver l 4328999 69343004 b
TABLE KSETLINE
MTRO 04 0 11 14 1 MDN SCA 0 Y Y 4328999 VISA_OCW 0 17 650 (3WC) (LNR) (KSH)
(AUTODISP) (CFX) (MWT) $ IVD
TABLE DNATTRS
650 432 8999
(PUBLIC ( NAME NEXTIRAONE) (MEMDISP ) (NONUNIQUE ) $)
(PRIVATE ( NAME NEXTIRAONE) (MEMDISP ) (NONUNIQUE ) $)$ $
TABLE DNGRPS
650 432 8999 8999
(PUBLIC ( ADDRESS 650 432 NNNN) $)
(PRIVATE ( ADDRESS DDD 720 NNNN) $)$
TABLE KSETFEAT
TUPLE NOT FOUND
TABLE CUSTSTN
TUPLE NOT FOUND
TABLE OFCVAR
AIN_OFFICE_TRIGGRP NIL
AIN Orig Attempt TDP: no subscribed trigger.
TABLE NCOS
VISA_OCW 17 0 0 CONFIRM ( XLAS PT17 NXLA NDGT) ( CRL 1 BLOCKED)$
TABLE CUSTHEAD: CUSTGRP, PRELIMXLA, CUSTXLA, FEATXLA, VACTRMT, AND DIGCOL
VISA_OCW CPT1 CT1 FT1 0 DGT1
TABLE DIGCOL
DGT1 6 RPT
TABLE IBNXLA: XLANAME PT17
TUPLE NOT FOUND
Default is to go to next XLA name.
TABLE IBNXLA: XLANAME CPT1
TUPLE NOT FOUND
Default is to go to next XLA name.
TABLE IBNXLA: XLANAME CT1
CT1 6 NET N Y 1 N NDGT N Y PVT 006 LCL NSCR $
TABLE DIGCOL
NDGT specified: digits collected individually
TABLE HNPACONT
006 Y 666 1000 ( 113) ( 1) ( 0) ( 0) 1 $
. SUBTABLE HNPACODE
. 9343004 9343007 LRTE 235
. SUBTABLE RTEREF
. 235 T IBNRT3 235
. . TABLE IBNRT3
. . 235 ISA N N N CALLMGR N PVT 1 PVT 2
. . . TABLE TRKGRP
```



```
. . . CALLMGR IBNT2 0 PRAC NCRT VISA_OCW 0 CCWCTH 240 N ANSDISC 0 Y N N N N N Y 0 0
N
. . . 0 0 0 0 N N N N N N N N N NATL (LTID PRITRK 24) $
. . . TABLE LTCALLS
. . . PRITRK 24 PVT XLAIBN 18 CCSA_SP18 NLCA_NIL VISA_OCW 0 240 $
. . . TABLE DIGMAN
. . . 2
. . . EXIT TABLE DIGMAN
. . . EXIT TABLE IBNRT3
. . . EXIT TABLE RTEREF
EXIT TABLE HNPACONT
LNP00100 SOC Option is IDLE.
LNP Info: Called DN is not resident.
LNP Info: HNPA results are used.
LNP00100 SOC Option is IDLE.
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
AIN Info Analyzed TDP: no subscribed trigger.
```

+++ TRAVER: SUCCESSFUL CALL TRACE +++

DIGIT TRANSLATION ROUTES

```
1 CALLMGR N CDN PVT L 9343004 PRVT 1 BC SPEECH
Outpulsing on this route is modified by the following options:
(DNIS)
```

```
TREATMENT ROUTES. TREATMENT IS: GNCT
1 T120
```

+++ TRAVER: SUCCESSFUL CALL TRACE +++



Configuring the Cisco Call Manager

- CUCM 4.1 Software Version
- CUCM 4.1-T1 Gateway Configuration
- Partitions Configuration
- Calling Search Space
- Enbloc Route Pattern Configuration
- Overlap Sending Route Pattern Configuration
- PSTN Route Pattern Configuration
- Translation Pattern for Incoming Calls
- CLIR and CNIR Route Pattern Configuration
- COLR and CONR Translation Pattern Configuration
- IP Phone Configuration
- Directory Number Configuration

Configuring the Cisco 3725 MGCP gateway:

Show version:
3725_T1#sh ver

Show diag:
3725_T1#sh diag

Show running:
3725_T1#sh run



Acronyms

Acronym	Definitions
ANF-PR	Additional Network Feature Path Replacement
AOC	Advice-of-charge. Information element is sent with the connection setup information for incoming Euro-ISDN connections. The AOC IE is used for call charge calculation.
CUCM	Cisco Unified CallManager
CCBS	Call Completion to Busy Subscriber
CCNR	Call Completion on No Reply
CFB	Call Forwarding on Busy
CFNR	Call Forwarding No Reply
CFU	Call Forwarding Unconditional
CLIP	Calling Line (Number) Identification Presentation
CLIR	Calling Line (Number) Identification Restriction
CMM	Communication Media Module (CMM) is a Cisco Catalyst® 6500 Series and Cisco 7600 Series line card that provides flexible and high-density T1/E1 gateways
CNIP	Calling Name Identification Presentation
CNIR	Calling Name Identification Restriction
COLP	Connected Line (Number) Identification Presentation
COLR	Connected Line (Number) Identification Restriction
CONP	Connected Name Identification Presentation
CONR	Connected Name Identification Restriction
CT	Call Transfer
MWI	Message Waiting Indicator
PSTN	Public Switched Telephone Network

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