Cisco 3640 Series Gateway-PBX Interoperability: Siemens Hicom 300E PBX with T1 CAS Signaling

This document describes the interoperability and configuration of a Cisco 3640 Series voice gateway with a Siemens Hicom PBX using T1 CAS signaling. It includes the following sections:

- System Components
- Configuration Tasks

System Components

PBX Model	Siemens Hicom 330E
PBX Release	9006.4
Telephony Signaling	T1 CAS, E&M
Voice Gateway	Cisco 3640
Gateway Release	IOS™ 12.0(2)T
VoX Protocol	H.323

Configuration Tasks

See the following sections for configuration tasks for this feature:

- Set Up
- Siemens Hicom PBX Configuration
- Cisco 3640 Gateway Configuration

Set Up

This section includes the following information:

- Connectivity Diagrams

Connectivity Diagrams

Figure 1: *Test Configuration*

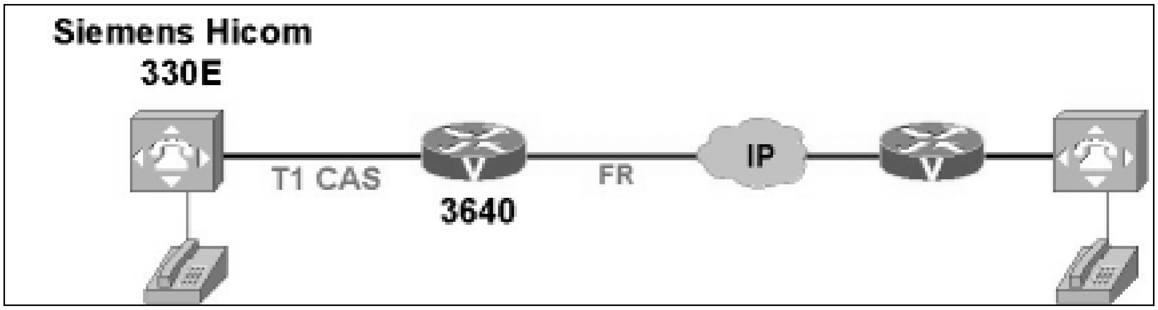

Figure 1 represents the configuration used for testing. A Siemens Hicom 330E PBX connected to a Cisco 3640 voice gateway via a T1 CAS connection.

Siemens Hicom PBX Configuration

PBX Screen for Trunk configuration using Wink-Start signaling; Trunk 13 (TAC-83)

```
<dis-tcsu:1-7-85-1;
DIS-TCSU:1-7-85-1;
H500:  AMO TCSU STARTED
+----------------------------------------------------------------------------------+
|  PEN:  1- 7- 85- 1   INS:  Y   BOARD:   TMD24BOS   DEV:  T1EMW    TGRP:   13 |
+----------------------------------------------------------------------------------+
|  TRKID    : 0846          TCCID      :                                         |
|  CCT      :         /0846                                                      |
|                                                                                |
|  ACDATA   :  0            DPLN       :  0          PFDGT     :                 |
|  ATNTNYP  :  TIE          EXPDG      : 10          PTTBLIDX  :  *              |
|  COPNO    :  13           ITR        :  0          REMANA    :                 |
|  COSNO    :  10           LCRCOSD    :  4          RULEIDX   :                 |
|  COTNO    :  13           LCRCOSV    :  1          TRTBL     :   DIDCR         |
|  DITDIX   :  0            LOCANA     :                                         |
|                                                                                |
|   *   =  NOT APPLICABLE   TO THIS BOARD TYPE                                   |
+----------------------------------------------------------------------------------+

AMO-TCSU  -111          TRUNK CONFIGURATION,  SWITCHING UNIT
DISPLAY COMPLETED;
```

PBX Screen for Class of Parameters Trunk 13

```
<dis-cop:13;
DIS-COP:13;
H500:   AMO   COP    STARTED

:      :                                   :       :       :      :
:      : S                   E  A          :       :       :      :
:      : T                E  S  N          :       :       :      :
:      : A     S     V    S  P  I  D       : DD    : S     :      :
:      : D     Z     L    P  D  D  T       : TT    : U     : P    :
:      : I  A  A  S  S    A  N  N  O       : MM    : P     : D    :
```

COP IDX	ANCKT LS	ANTIS	INSE	FFL	V 12	P 1234
13	X X			X	X	X

AMO-COP -111 CLASS OF PARAMETER
DISPLAY COMPLETED;

PBX Screen for Class of Trunk; Trunk 13

<**dis-cot:13;**
DIS-COT:13;
H500: AMO COT STARTED

COT	DIT	ANSR	DSA	DSAS	DIS	MDR	SAT	VLSAT	ESPANI	ESPDNIS	ANIDNIS	RFLASH
13		X			X							

AMO-COT -111 CLASS OF TRUNK FOR CALL PROCESSING
DISPLAY COMPLETED;

Route pattern definitions for TAC-83 (Trk-13)

```
------------------------------------------------------------------------------------------------------------------------
                                                | DIGIT PATTERN              : 83
                                                | AREA CODE FIELD IDX        : NONE
PLAN NUMBER:              2                     | OFFICE CODE FIELD IDX      : NONE
                                                | TYPE OF NUMBER                    : UNKNOWN
                                                | NUMBERING PLAN ID                 : WINK_TELEPHONY
------------------------------------------------------------------------------------------------------------------------
DIGIT ANALYSIS GROUP    :         0
ROUTE                   :         10
ACCOUNT FLAG            :
USER AUTHORIZATION      :         3
------------------------------------------------------------------------------------------------------------------------

------------------------------------------------------------------------------------------------------------------------
| ROUTENUM      = 10              SCHED A = X       AORT =          INFORMATION    |
|ROUTEELE       = 1                         B =     AUTH = 2        TRANS CAP = S  |
| BEARER = ONE                    C =       ONHKQ = N               TRKSIG = TIE   |
| BANDWTH       = 1                         D =     OFFHKQ = N              SCCID =    |
| TRUNKGRP      = 13                        E =     ODRNUM = 1              SVCVCE = NON   |
| MASTGRP       = 9                         F =     APLTYP = V              SVCN-V = NON   |
|                                           G =                             FACNUM =   |
|                                           H =   |
------------------------------------------------------------------------------------------------------------------------
END OF LCR ROUTE DEFINITION TABLE DISPLAY
AMO-LROUT-111           ROUTE DEFINITION DETERMINATION PACKAGE
DISPLAY COMPLETED;
```

PBX Screen for TRUNK GROUP ACCESS CODE; Trunk-13

```
<dis-tgacc:13;
DIS-TGACC:13;
H500:    AMO    TGACC    STARTED
+-------------------------------------------------------------------------------------------------------------------+
| TGRP NUMBER    :13          TGRP NAME          : 3640 VOIP1    /N    MAXIMUM NO:      24          |
| SUBGROUP NUMBER          :11          DEVICE TYPE        : T1  E&M WINK      DIR TYPE   :          |
| ACD THRESHOLD :          *            TRACENO            :0            USAGE TYPE:  TERR           |
| SELECTION                :    ROUND                      |
| ALLOCATED TO AT LEAST ONE ROUTE  GDTR RULE  :    0                                                          |
| THE FOLLOWING PORTS (LTG-LTU-SLOT-CIRCUIT) ARE ALLOCATED :                                                  |
+-------------------------------------------------------------------------------------------------------------------+
|  1- 7- 85- 1| 1- 7- 85- 2| 1- 7- 85- 3| 1- 7- 85- 4| 1- 7- 85- 5| 1-  85- 6|
+-------------------------------------------------------------------------------------------------------------------+
| 1- 7- 85- 7| 1- 7- 85- 8| 1- 7- 85- 9| 1- 7- 85- 10| 1- 7- 85- 11| 1- 85- 12|
+-------------------------------------------------------------------------------------------------------------------+
| 1- 7- 85- 13| 1- 7- 85- 14| 1- 7- 85- 15| 1- 7- 85- 15| 1- 7- 85- 16| 1- 7- 85- 17| 1- 85- 18|
+-------------------------------------------------------------------------------------------------------------------+
| 1- 7- 85- 19| 1- 7- 85- 20| 1- 7- 85- 21| 1- 7- 85- 22| 1- 7- 85- 23| 1- 85- 24|
+-------------------------------------------------------------------------------------------------------------------+

AMO-TGACC-111                TRUNK GROUP ACCESS CODE
DISPLAY COMPLETED;
```

Least Cost Routing Table

```
<dis-tgacc:13;
DIS-TGACC:13;
H500:    AMO   TGACC    STARTED
+-------------------------------------------------------------------------------------------------------------------------+
| TGRP NUMBER    :          13          TGRP NAME          : 3640 VOIP1    /N    MAXIMUMNO: 24   |
| SUBGROUP NUMBER          :11         DEVICE TYPE        : T1  E&M WINK      DIR TYPE  : B|
| ACD THRESHOLD :           *          TRACENO            :          0        USAGE TY PE:  TERR |
| SELECTION                 :    ROUND                    |
| ALLOCATED TO AT LEAST ONE ROUTE  GDTR RULE  :    0                                          |
| THE FOLLOWING PORTS (LTG-LTU-SLOT-CIRCUIT) ARE ALLOCATED :                                  |
+-------------------------------------------------------------------------------------------------------------------------+
|  1- 7- 85- 1| 1- 7- 85- 2| 1- 7- 85- 3| 1- 7- 85- 4| 1- 7- 85- 5| 1-  85- 6|
+-------------------------------------------------------------------------------------------------------------------------+
| 1- 7- 85- 7| 1- 7- 85- 8| 1- 7- 85- 9| 1- 7- 85- 10| 1- 7- 85- 11| 1- 85- 12|
+-------------------------------------------------------------------------------------------------------------------------+
| 1- 7- 85- 13| 1- 7- 85- 14| 1- 7- 85- 15| 1- 7- 85- 15| 1- 7- 85- 16| 1- 7- 85- 17| 1- 85- 18|
+-------------------------------------------------------------------------------------------------------------------------+
| 1- 7- 85- 19| 1- 7- 85- 20| 1- 7- 85- 21| 1- 7- 85- 22| 1- 7- 85- 23| 1- 85- 24|
+-------------------------------------------------------------------------------------------------------------------------+

AMO-TGACC-111                TRUNK GROUP ACCESS CODE
DISPLAY COMPLETED;
```

PBX Screen for TRUNK GROUP ACCESS CODE; Trunk-12

```
<dis-tgacc: 12;
DIS-TGACC: 12;
H500:   AMO   TGACC   STARTED
+-------------------------------------------------------------------------------------------------------------------------
----+
| TGRP NUMBER    :          12          TGRP NAME          : 3640 VOIP2    /N    MAXIMUM NO:      24 |
| SUBGROUP NUMBER          :          14          DEVICE TYPE        : T1  E&M WINK      DIR TYPE   :BOTH  |
| ACD THRESHOLD :           *          TRACENO            :          0        USAGE TY PE:       TERR      |
| SELECTION                 :          HIGH                                                              |
| ALLOCATED TO AT LEAST ONE ROUTE  GDTR RULE  :    0                                                      |
| THE FOLLOWING PORTS  (LTG-LTU-SLOT-CIRCUIT)  ARE ALLOCATED :                                            |
+-------------------------------------------------------------------------------------------------------------------------+
|  1- 7- 79- 1| 1- 7- 79- 2| 1- 7- 79- 3| 1- 7- 79- 4| 1- 7- 79- 5| 1- 79- 6|
+-------------------------------------------------------------------------------------------------------------------------+
|  1- 7- 79- 7| 1- 7- 79- 8| 1- 7- 79- 9| 1- 7- 79- 9| 1- 7- 79- 10| 1- 7- 79- 11| 1- 79- 12|
+-------------------------------------------------------------------------------------------------------------------------+
|  1- 7- 79- 13| 1- 7- 79- 14| 1- 7- 79- 15| 1- 7- 79- 16| 1- 7- 79- 17| 1- 79- 18|
+-------------------------------------------------------------------------------------------------------------------------+
|  1- 7- 79- 19| 1- 7- 79- 20| 1- 7- 79- 21| 1- 7- 79- 22| 1- 7- 79- 23|  - 7- 79 - 24 |
+-------------------------------------------------------------------------------------------------------------------------+

AMO-TGACC-111                TRUNK  GROUP  ACCESS  CODE
DISPLAY COMPLETED;
```

Cisco 3640 Gateway Configuration

The following is the configuration of the Cisco 3640 gateway connected to the Siemens Hicom 300E -PBX, T1 CAS E&M wink-start Interface.

Cisco 3640 Voice Gateway Version Information

```
3640-PBX-A# show version
Cisco Internetwork Operating System Software
IOS (tm) 3600 Software (C3640-JS-M), Experimental Version 12.0(19990517:072854)
[BLD-hawk.990516 106]
Copyright (c) 1986-1999 by cisco Systems, Inc.
Compiled Mon 17-May-99 10:44 by sdowler
Image text-base: 0x600088F0, data-base: 0x60ED6000

ROM: System Bootstrap, Version 11.1(7)AX [kuong (7)AX], EARLY DEPLOYMENT RELEASE
 SOFTWARE (fc2)

3640-PBX-A uptime is 3 minutes
System returned to ROM by power-on
System image file is "flash:c3640-js-mz.990516"

cisco 3640 (R4700) processor (revision 0x00) with 35840K/5120K bytes of memory.
Processor board ID 05634407
R4700 CPU at 100Mhz, Implementation 33, Rev 1.0
Bridging software.
X.25 software, Version 3.0.0.
SuperLAT software copyright 1990 by Meridian Technology Corp).
TN3270 Emulation software.
Primary Rate ISDN software, Version 1.1.
4 Ethernet/IEEE 802.3 interface(s)
1 Serial network interface(s)
3 Channelized T1/PRI port(s)
2 Voice FXO interface(s)
2 Voice E & M interface(s)
DRAM configuration is 64 bits wide with parity disabled.
125K bytes of non-volatile configuration memory.
24576K bytes of processor board System flash (Read/Write)
```

Cisco 3640 Voice Gateway Sample Configuration

```
3640-PBX-A#show running-config
!
version 12.0
service timestamps debug uptime
service timestamps log uptime
no service password-encryption
!
hostname 3640-PBX-A
!
boot system flash c3640-js-mz.990516
enable secret 5 $1$q8p8$9WpmKtpFAEi82gl0zvQJf0
!
!
!
!
!
voice-card 1
!
ip subnet-zero
!
!
!
controller T1 1/0
 framing esf
 clock source line primary
 linecode b8zs
```

```
 ds0-group 1 timeslots 1-24 type e&m-wink-start
 description TDM T1 to PBX RBS
!
controller T1 1/1
 framing esf
 linecode b8zs
!
controller T1 3/0
 framing esf
 linecode b8zs
 channel-group 0 timeslots 1-24 speed 64
!
!
voice-port 0/0/0
 description E&M to PBX
 operation 4-wire
!
voice-port 0/0/1
 operation 4-wire
 signal immediate
!
voice-port 0/1/0
 description FXO PORT TO PBX
!
voice-port 0/1/1
!
voice-port 1/0:1
!
dial-peer voice 4 voip
 destination-pattern 89796
 session target ipv4:10.0.0.2
!
dial-peer voice 40 pots
 destination-pattern 89795
 port 1/0:1
!
! NEXT TWO DIAL PEERS USED FOR TESTING
!
dial-peer voice 5 voip
 destination-pattern 9.....
 session target ipv4:10.0.0.2
!
dial-peer voice 6 pots
 destination-pattern 8.....
 port 1/0:1
!
process-max-time 200
!
interface Loopback1
 ip address 50.0.0.1 255.0.0.0
 no ip directed-broadcast
!
interface Ethernet2/0
 ip address 192.191.0.121 255.255.255.0
 no ip directed-broadcast
 no cdp enable
!
interface Ethernet2/1
 no ip address
 no ip directed-broadcast
 shutdown
 no cdp enable
!
interface Ethernet2/2
 no ip address
 no ip directed-broadcast
 shutdown
 no cdp enable
!
interface Ethernet2/3
 no ip address
 no ip directed-broadcast
```

```
 shutdown
 no cdp enable
!
interface Serial3/0:0
 mtu 300
 no ip address
 no ip directed-broadcast
 encapsulation frame-relay IETF
 no ip route-cache
 no keepalive
 no fair-queue
 ip rsvp bandwidth 1000 400
!
interface Serial3/0:0.1 point-to-point
 mtu 300
 ip address 10.0.0.1 255.0.0.0
 no ip directed-broadcast
 no ip route-cache
 no cdp enable
 frame-relay interface-dlci 100
!
interface Serial3/0:0.2 point-to-point
 mtu 300
 ip address 30.0.0.1 255.0.0.0
 no ip directed-broadcast
 no ip route-cache
 no cdp enable
 frame-relay interface-dlci 200
!
router rip
 network 10.0.0.0
 network 20.0.0.0
 network 135.16.0.0
!
ip classless
ip route 135.16.0.0 255.255.0.0 30.0.0.2
no ip http server
!
dialer-list 1 protocol ip permit
dialer-list 1 protocol ipx permit
no cdp run
!
!
line con 0
 exec-timeout 0 0
 password worldwide
 login
 transport input none
line aux 0
line vty 0 4
 password worldwide
 login
!
!
end
```