Cisco 3640 Series Gateway-PBX Interoperability: Siemens Hicom 300E PBX with Analog E&M Signaling

This document describes the interoperability and configuration of a Cisco 3640 voice gateway with a Siemens Hicom 300E PBX using Analog E&M signaling. It includes the following sections:

- System Components
- Connectivity Diagrams

System Components

PBX Model	Siemens Hicom 300E
PBX Release	
Telephony Signaling	Analog E&M
Voice Gateway	Cisco 3640
Gateway Release	IOS™ 12.1(1)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
- Set Up Notes
- Cabling Requirements

Connectivity Diagrams

Figure 1: *Test Configuration*

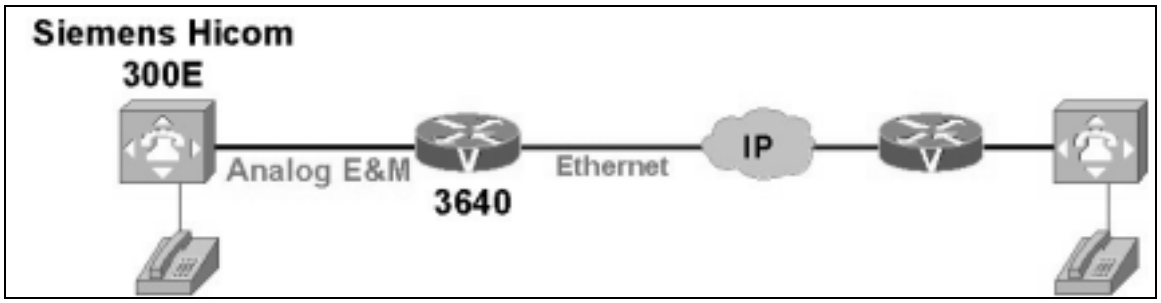

Figure 1 represents the configuration used for testing. A Siemens Hicom 300E PBX connected to a Cisco 3640 voice gateway via an Analog E&M connection.

Set Up Notes

- The Siemens PBX only supports **Type I 4-wire E&M**.

Cabling Requirements

E&M Wiring Connections:

RJ45	Cisco 3640	Siemens Hicom 300E
1	N/C	N/C
2	M	M11
3	R	R1
4	R1	R11
5	T1	T11
6	T	T1
7	E	E11
8	N/C	N/C

Siemens Hicom PBX Configuration

E&M Immediate Start DTMF

```
+-------------------------------------------------------------------------------+
| TGRP NUMBER    :    21   TGRP NAME  : E&MIMM          /N    MAXIMUM NO:    1 |
| SUBGROUP NUMBER:    15   DEVICE TYPE: TIE E&M IMMEDIATE     DIR TYPE  : BOTH |
| ACD THRESHOLD  :     *   TRACENO    :          0           USAGE TYPE: TERR |
| ALLOCATED TO AT LEAST ONE ROUTE                             GDTR RULE :    0 |
| SELECTION      :  ROUND  CFBLOCK    : DISABLED                                |
| THE FOLLOWING PORTS (LTG-LTU-SLOT-CIRCUIT) ARE ALLOCATED:                     |
```

```
+-------------------------------------------------------------------------------+
|  1- 2- 49- 1|  -  -   -  |  -  -   -  |  -  -   -  |  -  -   -  |  -  -   -  |
+-------------------------------------------------------------------------------+
```

E&M Wink Start DTMF

```
+-------------------------------------------------------------------------------+
| TGRP NUMBER    :    22   TGRP NAME  : E&MWINK         /N    MAXIMUM NO:    1 |
| SUBGROUP NUMBER:    14   DEVICE TYPE: TIE E&M WINK          DIR TYPE  : BOTH |
| ACD THRESHOLD  :     *   TRACENO    :          0           USAGE TYPE: TERR |
| ALLOCATED TO AT LEAST ONE ROUTE                            GDTR RULE :    0 |
| SELECTION      :  ROUND  CFBLOCK    : DISABLED                               |
| THE FOLLOWING PORTS (LTG-LTU-SLOT-CIRCUIT) ARE ALLOCATED:                     |
+-------------------------------------------------------------------------------+
|  1- 2- 49- 2|  -  -   -  |  -  -   -  |  -  -   -  |  -  -   -  |  -  -   -  |
+-------------------------------------------------------------------------------+
```

E&M Delay Start DTMF

```
+-------------------------------------------------------------------------------+
| TGRP NUMBER    :    23   TGRP NAME  : E&MDELAY        /N    MAXIMUM NO:    1 |
| SUBGROUP NUMBER:    10   DEVICE TYPE: TIE E&M DELAY         DIR TYPE  : BOTH |
| ACD THRESHOLD  :     *   TRACENO    :          0           USAGE TYPE: TERR |
| ALLOCATED TO AT LEAST ONE ROUTE                            GDTR RULE :    0 |
| SELECTION      :  ROUND  CFBLOCK    : DISABLED                               |
| THE FOLLOWING PORTS (LTG-LTU-SLOT-CIRCUIT) ARE ALLOCATED:                     |
+-------------------------------------------------------------------------------+
|  1- 2- 49- 3|  -  -   -  |  -  -   -  |  -  -   -  |  -  -   -  |  -  -   -  |
+-------------------------------------------------------------------------------+
```

Class of Trunk

```
H500:  AMO COT   STARTED
       |D|A|D|D|D|M|S|V|E|E|A|R|
       |I|N|S|S|I|D|A|L|S|S|N|F|
       |T|S|A|A|S|R|T|S|P|P|I|L|
       | |R| |S| | | |A|A|D|D|A|
       | | | | | | | |T|N|N|N|S|
       | | | | | | | | |I|I|I|H|
   COT | | | | | | | | |S|S| |
   ----+-+-+-+-+-+-+-+-+-+-+-+-+
     1 | |X| | | | | | | | | |
     2 | |X| | | | | | | | | |
     3 | | | | | | | | | | | |
     4 | | | | | | | | | | | |
     5 | | | | | | | | | | | |
     6 | |X| | | | | | | | | |
     7 | | | | | | | | | | | |
    10 |X|X| | |X|X| | | | | |
    11 | |X| | |X| | | | | | |
    12 | |X| | |X| | | | | | |
    13 | |X| | |X|X| | | | | |
    21 | |X| | |X| | | | | | |
    22 | |X| | |X| | | | | | |
    23 | |X| | |X| | | | | | |
    30 | | | | | |X| | | | | |
    31 | |X| | |X| | | | | | |
    32 | |X| | |X| | | | | | |
    33 | |X| | |X| | | | | | |
    90 | | | | | | | | | | | |
   ----+-+-+-+-+-+-+-+-+-+-+-+-+
```

Class of Parameter

```
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| A N C A A N I I N |FF| V|  P |
|IDX| L S K T T I S S E | L|12|1234|
+---+-------------------+--+--+----+
|  1|   X               |  |  |    |
|  2| X X               |  |  |X   |
|  3|                   |  |  |X   |
|  4|                   |  |  |X   |
|  5|                   |  |  |X   |
|  6| X X             X |  |  |X   |
|  7|                   |  |  |X   |
|  8|                   |X |  |    |
| 10| X X             X |X |  | X  |
| 11| X X               |X |X |X   |
| 12|   X               |X |  | X  |
| 13| X X X             |X |X |X   |
| 14| X X X             |X |X |X   |
| 15| X X X           X |X |X |X   |
| 16| X X X             |X |X | X  |
| 17| X X             X |X |  |X   |
| 18| X X               |X |X |X   |
| 19| X X               |X |X |X   |
| 20| X X X             |X | X|X   |
| 21|   X               |X |  | X  |
| 22| X X               |X |X |X   |
| 23| X X X             |X |X |X   |
| 30|                   |  |  |    |
| 31|   X               |  |  | X  |
| 32| X X               |  |X |X   |
| 33| X X X             |  |X |X   |
| 42| X X X           X |X |  | X  |
| 90|                   |X |  |    |
+---+-------------------+--+--+----+
```

Software Version

```
------------------------------------------------------------------------------
TERMINAL 1                      L O G O N                   00-09-01    08:57:28
------------------------------------------------------------------------------
  <dis-ansu;

DIS-ANSU;
H500:  AMO ANSU  STARTED
       APS TYPE     | NAME     | SP REFERENCE NO.
       -------------+----------+------------------
       SWU RES-CODE | S0-ET0SC | P30252B6500S00101
       SWU AMO-CODE | B0-ET0BC | P30252B6500B00101
       SWU RES-TEXT | S0-TTDSD | P30252B650DS00101



       SYSTEM NUMBER     | DB SUBSYSTEM NAME
       ------------------+------------------
       00000000000095393 | DB_SUSY_ZDBCCDSF
       00000000000095393 | DB_SUSY_ZDBCCDS0
       00000000000095393 | DB_SUSY_ZDBCCDS1
       00000000000095393 | DB_SUSY_ZDBCCDS2
       00000000000095393 | DB_SUSY_ZDBCCDSB
       00000000000095393 | DB_SUSY_ZDBCCDSC

AMO-ANSU -49        ENTERING THE SYSTEM NUMBERS INTO THE SWU DATABASE
DISPLAY COMPLETED;
  <
```

Cisco 3640 Gateway Configuration

The following is the configuration of the Cisco 3640 gateway connected to the Siemens Hicom 300E PBX Analog E&M interface.

Cisco 3640 Voice Gateway Version Information

```
sh ver
Cisco Internetwork Operating System Software
IOS (tm) 3600 Software (C3640-JS-M), Version 12.1(0.3.0), CISCO DEVELOPMENT TEST VERSION
Copyright (c) 1986-2000 by cisco Systems, Inc.
Compiled Wed 10-May-00 14:14 by samuel
Image text-base: 0x600088F8, data-base: 0x61484000

ROM: System Bootstrap, Version 11.1(20)AA2, EARLY DEPLOYMENT RELEASE SOFTWARE (fc1)

EUT_D uptime is 1 hour, 40 minutes
System returned to ROM by power-on
System image file is "flash:c3640-js-mz.0.3.0"

cisco 3640 (R4700) processor (revision 0x00) with 69632K/4096K bytes of memory.
Processor board ID 05589483
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.
2 Ethernet/IEEE 802.3 interface(s)
2 Voice FXO interface(s)
 --More-- ••••••••        •••••••••4 Voice FXS interface(s)
2 Voice E & M interface(s)
DRAM configuration is 64 bits wide with parity disabled.
125K bytes of non-volatile configuration memory.
12288K bytes of processor board System flash (Read/Write)
```

Cisco 3640 Voice Gateway Sample Configuration

```
sh run
Building configuration...

Current configuration:
!
version 12.1
service timestamps debug uptime
service timestamps log uptime
no service password-encryption
no service dhcp
!
hostname EUT_D
!
!
!
!
!
!
ip subnet-zero
no ip routing
no ip domain-lookup
ip host whiz 171.69.1.162
!
cns event-service server
!
!
!
!
```

```
!
!
!
interface Ethernet0/0
 ip address 171.69.231.7 255.255.255.0
 no ip route-cache
 no ip mroute-cache
 shutdown
 no cdp enable
!
interface Ethernet0/1
 ip address 10.1.1.1 255.255.255.0
 no ip route-cache
 no ip mroute-cache
 shutdown
 no cdp enable
!
ip classless
no ip http server
 --More--
no cdp run
!
!
voice-port 2/0/0
 operation 4-wire
 type 2
 signal immediate
!
voice-port 2/0/1
 operation 4-wire
 type 2
 signal immediate
!
voice-port 2/1/0
!
voice-port 2/1/1
!
voice-port 3/0/0
 timeouts ringing 15
 impedance 600c
 no battery-reversal
!
voice-port 3/0/1
 connection Tie-line +8
 impedance 600c
!
voice-port 3/1/0
!
voice-port 3/1/1
!
dial-peer voice 2 pots
 destination-pattern 2001
 port 2/1/1
!
dial-peer voice 5 pots
 destination-pattern 6
 port 2/0/1
!
dial-peer voice 6 pots
 destination-pattern 7....
!
dial-peer voice 7 voip
 destination-pattern 3...
 session target ipv4:100.100.100.1
 dtmf-relay h245-alphanumeric
 codec g711ulaw
!
```

```
dial-peer voice 3 pots
 numbering-type unknown
 answer-address 2000
 destination-pattern 9....
 port 3/0/0
!
dial-peer voice 4 pots
 destination-pattern 802
 port 2/1/0
!
!
line con 0
 transport input none
line aux 0
line vty 0 4
 no login
!
end
```