

IP Phone Call Failure with VT Advantage – Bearer Capability

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Introduction

This document describes and provides a solution for one reason why 7940, 7941, 7960, 7961, 7970, and 7971 IP phones associated with a camera fail to complete a call after the installation of Cisco VT Advantage. This solution also applies to the new 9951 series IP Phones that include the video camera attachment.

Note: This problem does not exist before the installation of Cisco VT Advantage.

Prerequisites

Requirements

Cisco recommends that you have knowledge of these topics:

- Cisco CallManager
- VT Advantage

Components Used

The information in this document is based on these software and hardware versions:

- Cisco CallManager 4.x
- VT Advantage 1.x

The information in this document was created from the devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If your network is live, make sure that you understand the potential impact of any command.

Conventions

Refer to Cisco Technical Tips Conventions for more information on document conventions.

Background Information

The bearer channel is the fundamental component of ISDN interfaces. It carries 64,000 bits per second (64 kbps) in either direction.

A number called the bearer cap (literally means 'bearer capability') is transmitted as part of the ISDN Q.931 setup messages during the setup of an ISDN call. This number is a request to the network exchange equipment to ask if a particular type of encoding is allowed. If the Telco exchange equipment allows it, this is indicated back to the originating equipment and the call is attempted to the destination.

The first four rows of this table show common bearer caps for voice calls. The last three rows show common bearer caps that can cause a call that originates from a Third party H.323 device to fail.

| Bearer Cap | Information Transfer Capability | User Information Layer 1 Protocol |
|-------------------|--|--|
| 0x8090A2 | Speech | G.711 u-Law Speech |
| 0x8090A3 | Speech | G.711 A-law |
| 0x9090A2 | 3.1 KHz Audio | G.711 u-Law Speech |
| 0x9090A3 | 3.1 KHz Audio | G.711 A-law |
| 0x8890A2 | Unrestricted digital information | G.711 u-Law Speech |
| 0x8890A3 | Unrestricted digital information | G.711 A-law |
| 0x8890 | Unrestricted digital information | 64 Kbps (64k data call) |

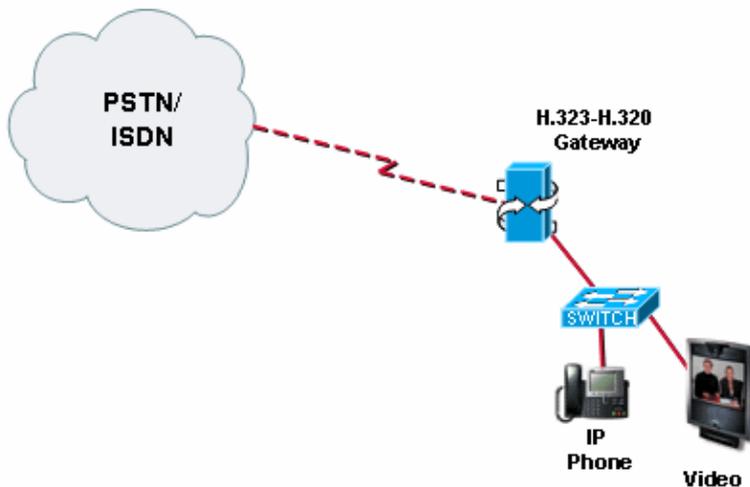
Problem

After you install Cisco VT Advantage, a call from the 7970 phone associated with a camera cannot complete a call. This problem does not exist before you install Cisco VT Advantage.

Here is the call failure sequence:

1. A call is made with a 7970 that includes a camera.
2. The call arrives at the gateway.
3. The gateway sends the call to Telco.
4. Telco rejects the call.

Figure 1 Topology



Solution

When you issue the **debug isdn q.931** command on the gateway to analyze the trace output created, these items are identified:

- **Information Transfer Capability** Unrestricted digital information.
- **Information Transfer Mode** Circuit mode information.
- **Information Transfer Rate** Multirate, 64 kbps base rate, Rate = 384 kbps, == 6 B-channels.
- **User Information Layer 1 Protocol** H.221 and H.242.

This problem is centered on the Information Transfer Capability. It is a compatibility issue between the gateway and Telco. Calls from a 7970 with a camera receive one-way audio because the bearer cap in the ISDN Q.931 SETUP message indicates that the Information Transfer Capability is set for Unrestricted Digital Information. The reason this occurs is because the originating H.323 device sets the bearer cap in the H.225 SETUP message for Unrestricted Digital Information. The gateway transparently passes that information to Telco in the Q.931 SETUP message. Telco is unable to handle this bearer cap and rejects the call.

The solution is to modify the Cisco IOS® gateway configuration to overwrite the bearer cap in the ISDN Q.931 SETUP message. Use the **bearer-cap** command in voice-port configuration mode to set the gateway for speech or 3100 hz audio as appropriate.

This example output shows a configuration for a Cisco AS5300 that serves as the gateway:

```
test-5300-2(config)#voice-port 0:D
test-5300-2(config-voiceport)#bearer-cap ?
    3100hz  enable 3100hz
    speech  enable speech
esc-5300-2(config-voiceport)#bearer-cap speech
```

```
!--- Sample output of the IOS configuration
!--- <some output omitted>.
```

```
!
voice-port 0:D
  bearer-cap Speech
!
```

The problem is solved after you modify the bearer-cap on the gateway to match what Telco supports (either speech or 3100 hz audio).

Note: In some situations this solution is not enough to make the voice call from Cisco VT Advantage to an H.323 gateway work. You need to make some configuration changes in the Cisco CallManager to which Cisco VT Advantage is registered.

Complete these steps in order to set the Video Call Bandwidth for calls from the VT Advantage region towards the H.323 gateway region to **None**.

1. Identify the regions to which both VT Advantage and the H.323 gateway belong. In order to do this, find the device pool to which the device belongs and then find the region to which the device pool belongs.
2. Go to the Cisco CallManager Administration page, and choose **System >Region**.
3. Click the region to which VT Advantage belongs, and click **None** under **Video Call Bandwidth** for the corresponding region to which the H.323 gateway belongs.

Region Configuration

Region: VT Advantage
Status: Ready

Update Delete Restart Devices

Region Information

Region Name* VT Advantage

Call Information

The maximum audio codec/video bandwidth supported within this region and between 5 other regions are:

| Region | Audio Codec | Video Call Bandwidth |
|-----------------------------------|-------------|--|
| AB1 | G.711 | <input type="radio"/> None <input checked="" type="radio"/> 384 kbps |
| Default | G.711 | <input type="radio"/> None <input checked="" type="radio"/> 384 kbps |
| H.323 PSTN gateway | G.711 | <input checked="" type="radio"/> None <input type="radio"/> kbps |
| VT Advantage (Within this Region) | G.711 | <input type="radio"/> None <input checked="" type="radio"/> 384 kbps |

4. Click **Update**.
5. Restart all of the devices in their respective regions in order for the change to take effect.

Refer to CallManager to use VT Advantage Configuration Example for more information on how to configure VT Advantage with Cisco CallManager.

Related Information

- **Voice Technology Support**
- **Voice and IP Communications Product Support**
- **Troubleshooting Cisco IP Telephony**
- **Technical Support & Documentation – Cisco Systems**

