

# Cisco VoIP Call Leg Paths

A voice call over a packet network is segmented into discrete call legs that are associated with dial-peers (a dial-peer is associated with each call leg).

A gatekeeper is an H.323 entity on a LAN that provides address translation and control access to the LAN for H.323 terminals and gateways

c3725-ix-mz.123-9.bin

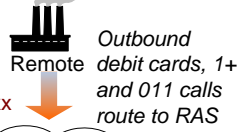
A protocol called **Registration, Admission, and Status (RAS)** is used between the gateway and the gatekeeper. This allows the gateway to register the E.164 addresses with the gatekeeper

All VoIP packets are made up of two components: **voice samples** and **IP/UDP/RTP headers**. Although the voice samples are compressed by the Digital Signal Processor (DSP) and may vary in size based on the codec used, these headers are a constant **40 bytes** in length. When compared to the 20 bytes of voice samples in a default G.729 call, these headers make up a considerable amount of overhead. Using cRTP, these headers can be compressed to **two or four bytes**. This compression offers significant VoIP bandwidth savings. For example, a default G.729 VoIP call consumes 24 Kb without cRTP, but only 12 Kb with cRTP enabled.

Because cRTP compresses VoIP calls on a **link-by-link** basis, both ends of the IP link need to be configured for cRTP.

## E0/0 (Remote router)

```
h323-gateway voip interface
h323-gateway voip id XYZVOIP ipaddr 192.16.4.237 1718
h323-gateway voip h323-id sitename
h323-gateway voip tech-prefix sitenummer
```



192.16.4.237 Cisco 3725 Router



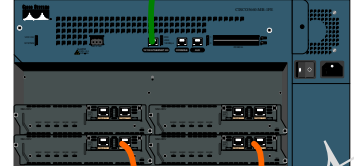
**XYZ\_BBN\_Gatekeeper**  
12.3(9)  
gatekeeper  
zone local **XYZVOIP xyzcorp.net**

**E0/0**  
h323 interface  
h323 t120 bypass

**Call leg VoIP Dial-peer 1**

```
E0/0
h323-gateway voip interface
h323-gateway voip id XYZVOIP ipaddr 192.16.4.237 1718
h323-gateway voip h323-id PRIGW3.MIA
h323-gateway voip tech-prefix 1
h323-gateway voip tech-prefix 011
```

192.16.4.63 Cisco 3660 Router



**PRIGW3.MIA**  
12.3(10a)

All voice cards:  
codec complexity high

**High Density Voice Network Modules**  
NM-HDV with one (1) VWIC-2MFT-T1-DI and four (4) PVDM-12s (3 TI 549 DSPs)

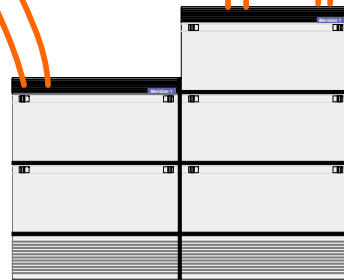
Up to 23 channels of high-complexity voice or fax-relay (G.729)

framing esf  
linecode b8zs  
pri-group timeslots 1-24

**Call leg POTS Dial-peer 2**

```
voice call carrier capacity active
voice rtp send-recv
!
voice service voip
modem passthrough nse codec g711ulaw
!
voice class codec 10
codec preference 1 g729r8 bytes 60
codec preference 2 g723r63
```

```
dial-peer voice 5551 pots
description US Domestic Calls
preference 1
destination-pattern 1.....
port 1/0:23
forward-digits all
!
dial-peer voice 5552 pots
description International Calls
destination-pattern 011T
port 1/0:23
forward-digits all
```



PBX

Public Switched Telephone Network  
**PSTN**  
Outbound POTS calls

## VoIP Billing Platform

Cisco AS5400 Routers



Database



IVR au file processing

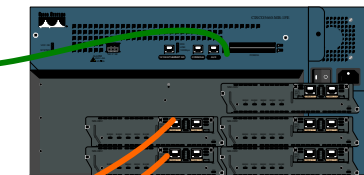
radius-server host 10.23.31.89

**Call leg POTS (via AS5400)**

**Call leg VoIP Dial-peer 3**

```
E0/0
h323-gateway voip interface
h323-gateway voip id XYZVOIP ipaddr 192.16.4.237 1718
h323-gateway voip h323-id PRIGW4.MIA
h323-gateway voip tech-prefix 1
h323-gateway voip tech-prefix 011
```

192.16.4.64 Cisco 3660 Router



**PRIGW4.MIA**  
12.3(10a)

Each gateway, 3660, is registered with the local gatekeeper.

**High Density Voice Network Modules**  
NM-HDV with one (1) VWIC-2MFT-T1-DI and four (4) PVDM-12s

The **session target** in the dial-peer voice **nnnn voip** points to Registration, Admission, and Status (RAS). RAS defines where the gateway will register with the gatekeeper, sends admission requests for each call, and conducts certain status information polling for calls.

```
dial-peer voice 5563 voip
description To Remote site
destination-pattern 4...
progress_ind setup enable 3
session target ras
dtmf-relay cisco-rtp h245-alphanumeric
codec g729r8 bytes 60
fax rate 14400
ip qos dscp cs5 media
```

### Useful voice related commands:

```
>sh gatekeeper status
>sh gatekeeper endpoints
(Status of all registered endpoints for a gatekeeper)
>sh gatekeeper gw-type-prefix
(Shows which gateways can handle which prefixes)
>sh gatekeeper calls
(Shows active calls on gatekeeper)
>sh call active voice brief
(Show the active call table)
>sh call his voice brief
>sh voice call summary
(shows call status for all voice ports on the gateway)
>sh voip rtp connections
>sh voice dsp (DSP ID information)
>sh call his voice brief | inc Orig
>sh dialplan number <number>
(Shows which dialpeer will be selected)
>csim start <number>
(Hidden command dials out w/o handset)
>debug h225 asni
>debug ras
>debug voip ccapi inout
(shows call setup information/sign)
```