



CHAPTER 3

ISDN Backhaul Support Using IUA/SCTP

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Introduction

This chapter describes the support of ISDN backhaul using ISDN Q.921-User Adaptation (IUA) and the Stream Control Transmission Protocol (SCTP). This support applies to both the user and network interfaces of an ISDN PRI configuration for facility associated signaling (FAS) as defined in RFC 3057. At this time, only FAS is supported for IUA. Using the Reliable User Datagram Protocol (RUDP) for PRI backhauling is not impacted by IUA/SCTP support. An ISDN trunking gateway can be configured to use either RUDP or IUA, but not both at the same time.

IUA/SCTP Protocols

IUA and SCTP are two protocols defined for the transportation of telephony signaling over a packet network. SCTP is a reliable transport protocol like RUDP. IUA is the adaptation layer that makes SCTP services available to Q.921 services users, such as Q.931 and NI2. There are several benefits to using IUA/SCTP in place of Session Manager (SM)/RUDP, including the following:

- the multi-streaming feature of SCTP allows each D-channel to use a different stream to prevent head-of-line blocking.
- the multi-homing feature of SCTP provides more efficient network redundancy compared to RUDP.
- SCTP allows a configurable maximum outstanding receive window in number of bytes to get data through the network faster. RUDP supports a fixed value of 32 datagrams.
- SCTP uses dynamic timers based on calculated round trip time; RUDP has fixed timers.
- SCTP provides a cookie mechanism for better security.

In a typical network topology, one SCTP association is established between the gateway and each Call Agent. Multiple SCTP streams are carried out within each association. One stream is always dedicated for management purposes, and separate SCTP streams are used for each D-channel. Two IP addresses for each side are designated to the same SCTP association for multi-homing.

The IUA manager (IUM) process provides an interface to the IUA and SCTP stacks and communicates with the gateways. The Cisco SCTP and IUA stacks are used for this feature.

Provisioning an IUA Trunk Group

This section provides examples of the steps required to build and provision an IUA trunk group on the Cisco BTS 10200 Softswitch.



Note

These tasks include examples of CLI commands that illustrate how to provision the specific feature. Most of these tables have additional tokens that are not included in the example. For a complete list of all CLI tables and tokens, refer to the *Cisco BTS 10200 Softswitch Command Line Interface Reference Guide*.

Step 1 Add a media gateway profile.



Note

Several tokens have values that can be overwritten after the Call Agent queries the media gateway for supported capabilities. If the media gateway returns a value different from the value originally provisioned, the returned value automatically replaces the originally provisioned value.

```
add mgw-profile id=5400-iuasctpmgwp;vendor=Cisco;refresh-digit-map=y;
```

Step 2 Add a media gateway.

```
add mgw id=5400-iuasctp-mgw; tsap-addr=c5400-93; call-agent-id=CA146;
mgw-profile-id=5400-iuasctpmgwp; type=TGW; mgw-port=2427;
```

Step 3 Add an SCTP Association profile. The remote port configured in the SCTP Association table must match the local port specified in the gateway side when the Application Server was configured.

```
add sctp-assoc-profile id=5400-sctp-asscp;
```

Step 4 Add an SCTP Association. The ULP token must be set to IUA for IUA/SCTP backhauling. The remote port specified in the gateway to configure ASP must match the standard local port used in the Cisco BTS 10200 Softswitch (for example, 9900).

```
add sctp-assoc id=iuasctp-assc1;ulp=IUA;
mgw-id=5400-iuasctp-mgw;sctp-assoc-profile-id=5400-sctp-asscp;platform-id=CA146;
remote-port=9900;remote-tsap-addr1=c5400-93;
```

Step 5 Add an ISDN D channel profile.

```
add isdn-dchan-profile id=iua-dchanp
```

Step 6 Add the ISDN interface. The ISDN Interface table defines the number of T1s per primary rate interface (PRI).

```
add isdn-intf intf=0;isdn-dchan-id=iua-s70;
```

Step 7 Add the ISDN D-channel. Backhaul type must be set to IUA for IUA/SCTP backhauling.

```
add isdn-dchan id=iua-s70; dchan-type=PRIMARY; dchan-format=slot-port; dchan-slot=7;
dchan-port=0; sctp-assoc-id=iuasctp-assc1; backhaul-type=IUA;
isdn-dchan-profile-id=iua-dchanp;
```

Step 8 Add an ISDN trunk group profile.

```
add isdn-tg-profile id=iua-dchnl-tgp1;
```

Step 9 Add a trunk group. Pop1 and tb16 have already been provisioned.

```
add trunk-grp id=54007001;call-agent-id=CA146;tg-type=ISDN;tg-profile-id=iua-dchnl-tgp1;
glare=ALL; mgcp-pkg-type=T; dial-plan-id=tb16; isdn-dchan-id=iua-s70;pop-id=pop1;
```

Step 10 Add a termination.

```
add termination prefix=S7/DS1-0/;port-start=1;port-end=23;type=trunk;
mgw-id=5400-iuasctp-mgw;
```

Step 11 Add a trunk.

```
add trunk cic-start=1; cic-end=23; tgn-id=54007001; mgw-id=5400-iuasctp-mgw;
termination-prefix=S7/DS1-0/; termination-port-start=1; termination-port-end=23; intf=0;
```



Note

To support multiple trunk groups in one D-channel configuration, the 23 B-channels or CICs in the trunk table can be split or logically grouped into different trunk groups. See [Chapter 2, “Multiple Trunk Groups on a Single ISDN D-Channel”](#) for more information.

Step 12 Add a route. The Route table contains a list of up to ten trunk groups to route a call.

```
add route id=isdn-iua-te; tgn1-id=54007001;
```

Step 13 Add a route guide.

```
add route-guide ID=isdn-iua-rg; policy-type=ROUTE; policy-id=isdn-iua-rte;
```

Step 14 Add a destination.

```
add destination dest-id=isdn-iua; call-type=toll; route-type=ROUTE; route-id=isdn-iua-rte;
route-guide-id=isdn-iua-rg;
```

Step 15 Add a dial plan.

```
add dial-plan id=tb16; digit-string=416483; dest-id=isdn-iua;
```

Step 16 Control the media gateway, SCTP Association, ISDN D-Channel and the trunk group in service (in the order stated).

```
control mgw id=5400-iuasctp-mgw;target-state=INS;mode=forced;
control sctp-assoc id=iuasctp-assc1;target-state=INS;mode=forced;
control isdn-dchan id=iua-s70;dchan-type=PRIMARY; target-state=INS;
control trunk-grp id=54007001;target-state=INS;mode=forced;
```

Step 17 Equip the trunk termination and control it in service.

```
equip trunk-termination tgn-id=54007001;cic=all;

control trunk-termination tgn-id=54007001; cic=all; target-state=INS; mode=forced;
```

