

VCO/4K: Provisioning Circuits for ISUP and MTP Provisioning

Document ID: 14056

Cisco has announced the end of sale for the VCO/4K product line. For more information, refer to End-of-Sales Announcement for the Cisco VCO/4K Product Line.

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Introduction

Signaling System 7 (SS7) is a multilayer communication protocol. The Message Transfer Part (MTP) defines the first three layers. These layers are Layers 1, 2, and 3. After the establishment of these layers, applications perform these functions:

- Route messages Signaling Connection Control Part (SCCP)
- Set up a path through the network ISDN User Part (ISUP)
- Perform call processing services Transaction Capabilities Application Part (TCAP)
- Monitor Operations, Administration, Maintenance, and Provisioning (OAM&P)

This document discusses only the setup of ISUP and MTP for the Virtual Central Office (VCO) SS7 subsystem.

Prerequisites

Requirements

Readers of this document should have knowledge of these topics:

- SS7 concepts
- Cisco VCO administration

Components Used

The information in this document is appropriate for all VCO/4K software and hardware versions.

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

For more information on document conventions, refer to the Cisco Technical Tips Conventions.

ISUP.mml

The VCO SS7 subsystem is a UNIX-based system that uses ASCII files in order to configure ISUP. The primary file that the system uses is ISUP.mml. This file is in the \$SPA path. You can use any one of several UNIX text editors, which include vi, in order to write the ISUP.mml file. The ISUP file provisions the ISUP trunk groups along with other generic information, such as the Destination Point Code (DPC).

The parameters for ISUP are:

- **DPC** This parameter is the DPC of the end office to which the ISUP trunks connect.
- **group id (GRPID) and trunk group id (TRNKGRPID)** These parameters are used for the route of calls on ISUP trunks.
- **CCTNUM and Range** These parameters are the number of ISUP trunks in the trunk group.

Here is an illustration of the ISUP.mml file:

```
MODIFY-ISUPCONF:CFGNAME=CF0,VARIANT=GENERIC,MNTIND=ON;
ADD-ISUPNODE:PCNO=1,DPC=240-050-002;
ADD-ISUPCGRP:PCNO=1,GRPID=0,CCTNUM=24,TRNKGRPID=1;
ADD-ISUPCCT:PCNO=1,GRPID=0,CCTNUM=0,RANGE=24;
ADD-ISUPCGRP:PCNO=1,GRPID=1,CCTNUM=24,TRNKGRPID=2;
ADD-ISUPCCT:PCNO=1,GRPID=1,CCTNUM=0,RANGE=24;
ADD-ISUPCGRP:PCNO=1,GRPID=2,CCTNUM=24,TRNKGRPID=3;
ADD-ISUPCCT:PCNO=1,GRPID=2,CCTNUM=0,RANGE=24;
ADD-ISUPCGRP:PCNO=1,GRPID=3,CCTNUM=24,TRNKGRPID=4;
ADD-ISUPCCT:PCNO=1,GRPID=3,CCTNUM=0,RANGE=24;
ADD-ISUPCGRP:PCNO=1,GRPID=4,CCTNUM=24,TRNKGRPID=5;
ADD-ISUPCCT:PCNO=1,GRPID=4,CCTNUM=0,RANGE=24;
ADD-ISUPCGRP:PCNO=1,GRPID=5,CCTNUM=24,TRNKGRPID=6;
ADD-ISUPCCT:PCNO=1,GRPID=5,CCTNUM=0,RANGE=24;
ADD-ISUPCGRP:PCNO=1,GRPID=6,CCTNUM=24,TRNKGRPID=7;
ADD-ISUPCCT:PCNO=1,GRPID=6,CCTNUM=0,RANGE=24;
ADD-ISUPCGRP:PCNO=1,GRPID=7,CCTNUM=24,TRNKGRPID=8;
ADD-ISUPCCT:PCNO=1,GRPID=7,CCTNUM=0,RANGE=24;
ADD-ISUPCGRP:PCNO=1,GRPID=8,CCTNUM=24,TRNKGRPID=9;
ADD-ISUPCCT:PCNO=1,GRPID=8,CCTNUM=0,RANGE=24;
ADD-ISUPCGRP:PCNO=1,GRPID=9,CCTNUM=24,TRNKGRPID=10;
ADD-ISUPCCT:PCNO=1,GRPID=9,CCTNUM=0,RANGE=24;
ADD-ISUPCGRP:PCNO=1,GRPID=10,CCTNUM=24,TRNKGRPID=11;
ADD-ISUPCCT:PCNO=1,GRPID=10,CCTNUM=0,RANGE=24;
ADD-ISUPCGRP:PCNO=1,GRPID=11,CCTNUM=24,TRNKGRPID=12;
ADD-ISUPCCT:PCNO=1,GRPID=11,CCTNUM=0,RANGE=24;
ADD-ISUPCGRP:PCNO=1,GRPID=12,CCTNUM=24,TRNKGRPID=13;
ADD-ISUPCCT:PCNO=1,GRPID=12,CCTNUM=0,RANGE=24;
ADD-ISUPCGRP:PCNO=1,GRPID=13,CCTNUM=24,TRNKGRPID=14;
ADD-ISUPCCT:PCNO=1,GRPID=13,CCTNUM=0,RANGE=24;
ADD-ISUPCGRP:PCNO=1,GRPID=14,CCTNUM=24,TRNKGRPID=15;
ADD-ISUPCCT:PCNO=1,GRPID=14,CCTNUM=0,RANGE=24;
ADD-ISUPCGRP:PCNO=1,GRPID=15,CCTNUM=24,TRNKGRPID=16;
ADD-ISUPCCT:PCNO=1,GRPID=15,CCTNUM=0,RANGE=24;
ADD-ISUPCGRP:PCNO=1,GRPID=16,CCTNUM=24,TRNKGRPID=17;
ADD-ISUPCCT:PCNO=1,GRPID=16,CCTNUM=0,RANGE=24;
ADD-ISUPCGRP:PCNO=1,GRPID=17,CCTNUM=24,TRNKGRPID=18;
ADD-ISUPCCT:PCNO=1,GRPID=17,CCTNUM=0,RANGE=24;
ADD-ISUPCGRP:PCNO=1,GRPID=18,CCTNUM=24,TRNKGRPID=19;
ADD-ISUPCCT:PCNO=1,GRPID=18,CCTNUM=0,RANGE=24;
ADD-ISUPCGRP:PCNO=1,GRPID=19,CCTNUM=24,TRNKGRPID=20;
```

```

ADD-ISUPCCT:PCNO=1,GRPID=19,CCTNUM=0,RANGE=24;
ADD-ISUPCGRP:PCNO=1,GRPID=20,CCTNUM=24,TRNKGRPID=21;
ADD-ISUPCCT:PCNO=1,GRPID=20,CCTNUM=0,RANGE=24;
ADD-ISUPCGRP:PCNO=1,GRPID=21,CCTNUM=24,TRNKGRPID=22;
ADD-ISUPCCT:PCNO=1,GRPID=21,CCTNUM=0,RANGE=24;
ADD-ISUPCGRP:PCNO=1,GRPID=22,CCTNUM=24,TRNKGRPID=23;
ADD-ISUPCCT:PCNO=1,GRPID=22,CCTNUM=0,RANGE=24;
ADD-ISUPCGRP:PCNO=1,GRPID=23,CCTNUM=24,TRNKGRPID=24;
ADD-ISUPCCT:PCNO=1,GRPID=23,CCTNUM=0,RANGE=24;
ADD-ISUPCGRP:PCNO=1,GRPID=24,CCTNUM=24,TRNKGRPID=25;
ADD-ISUPCCT:PCNO=1,GRPID=24,CCTNUM=0,RANGE=24;
ADD-ISUPCGRP:PCNO=1,GRPID=25,CCTNUM=24,TRNKGRPID=26;
ADD-ISUPCCT:PCNO=1,GRPID=25,CCTNUM=0,RANGE=24;
ADD-ISUPCGRP:PCNO=1,GRPID=26,CCTNUM=24,TRNKGRPID=27;
ADD-ISUPCCT:PCNO=1,GRPID=26,CCTNUM=0,RANGE=24;
ADD-ISUPCGRP:PCNO=1,GRPID=27,CCTNUM=24,TRNKGRPID=28;
ADD-ISUPCCT:PCNO=1,GRPID=27,CCTNUM=0,RANGE=24;
MODIFY-ISUPOFFINFO:PCNO=1,ANMOFF=1,ACMOFF=1,CRGOFF=0;
EXIT:;

```

MTP.mml

The VCO SS7 subsystem is a UNIX-based system that uses ASCII files in order to configure MTP. The primary file that the system uses is MTP.mml. This file is in the \$SPA path. You can use any one of several UNIX text editors, which include vi, in order to write the MTP.mml file. The MTP.mml file defines linksets, links, combined linksets, routes, and route sets.

The parameters for MTP are:

- **signaling point code name (NAME)** This parameter is the text name for a signaling point.
- **signaling point code (SPC)** This parameter is the point code for a signaling point.
- **number plan identifier (NI)** This parameter can be national, international, or private. Usually, it is national.
- **Type** This parameter specifies whether the SS7 subsystem is signaling transfer point (STP) or signaling end point (SEP).

Note: The SS7 subsystem software only supports SEP.

- **restart** You can set this parameter to on or off.

Parameters for the linkset (LSET) within the MTP.mml file are:

- **(LSET)** The linkset parameters are the linkset name.
- **(DPC)** This parameter indicates the destination point code for the linkset.
- **loaded** This parameter indicates whether you want the link loaded. 1 indicates loaded. 0 indicates not loaded.
- **active** This parameter indicates whether you want the link active or passive.
- **(TYPE)** This parameter indicates link type, either ALink, BLink, CLink, DLink, ELink, or FLink. Normally, the type is ALink for end offices.
- **(BR)** This parameter indicates the bit rate, which is either 56,000 or 64,000. The bit rate is normally 56,000 in North America.

Parameters for the linkset (LSET) within the MTP.mml file are:

- **(LINK)** This parameter indicates the link name.
- **(LSET)** This parameter indicates the linkset to which the link belongs.
- **slc** This parameter indicates the signaling link controller.
- **(PORT)** This parameter indicates the port number on the SS7 box. The number is from 1 to 4.

- **(TYPE)** This parameter indicates the equipment type, either DTE or DCE. The equipment type is usually DTE.
- **priority** The priority can be between 0 and 3. 0 is the highest priority.

Parameters for the ROUTE (ROUTE) within the MTP.mml file are:

- **(RTSET)** This parameter indicates the text route set name.
- **(LSET)** This parameter indicates the linkset to which the route belongs.
- **priority** This parameter indicates the priority of the linkset.

Parameters for the ROUTE SET (RTSET) within the MTP.mml file are:

- **(RTSET)** This parameter is the text route set name.
- **(DPC)** This parameter is the destination point code for the route set.
- **(ROUTE1)** This parameter indicates the route for the route set.

Parameters for the RTSET within the MTP.mml file are:

- **(CMBLSET)** This parameter is the text combined linkset name.
- **(LSET1)** This parameter is the first linkset.
- **(LSET2)** This parameter is the second linkset.

Additionally, you must add the modify statement in order to make the links active. This is an illustration of the MTP.mml file:

```
MML-CONFIG:LOG=ON,TIMEOUT=6000;
MODIFY-SP:NAME=WENACH1,SPC=005-065-136,NI=NATIONAL,TYPE=SEP,RESTART=OFF,SLTC=OFF;
ADD-LSET:LSET=EVERETT,DPC=240-058-000,LOADED=1,ACTIVE=1,TYPE=ALINK,BR=56000;
ADD-LSET:LSET=BOTHELL,DPC=240-057-000,LOADED=1,ACTIVE=1,TYPE=ALINK,BR=56000;
ADD-LINK:LINK=EVELINK1,LSET=EVERETT,SLC=0,PORT=1,TYPE=DTE,PRIORITY=0;
ADD-LINK:LINK=BOTLINK1,LSET=BOTHELL,SLC=0,PORT=2,TYPE=DTE,PRIORITY=0;
ADD-ROUTE:RTSET=EVERETTSTP,LSET=BOTHELL,PRIORITY=1;
ADD-ROUTE:RTSET=BOTHELLSTP,LSET=EVERETT,PRIORITY=2;
ADD-CMBLSET:CMBLSET=EVANDBO,LSET1=EVERETT,LSET2=BOTHELL;
ADD-RTSET:RTSET=GTEWENACH1,DPC=240-050-002,ROUTE1=EVANDBO;
MODIFY-LSET:LSET=EVERETT,ADMINSTATE=ACTIVE;
MODIFY-LSET:LSET=BOTHELL,ADMINSTATE=ACTIVE;
DISPLAY-RTSET:RTSET=*;DISPLAY-LSET:LSET=*;
EXIT;
```

SS7 Box with Use of isup_console

The **isup_console** command is set within the SS7 box. The command allows for ISUP circuit group resets, blocks, validation, unblocking, and switchover messages. Here is an example of this command:

```
% isup_console
ANSI Version 5.0 FSR01 Copyright (c) 1996, 1997, 1998 Summa Four, Inc.
Enter a command (b,d,f,h,i,l,m,r,s,S,u,v,x): ?
Enter: 'b' for sending a Blocking message.
'd' for setting/clearing debug switches.
'f' for setting/clearing feature flags.
'h' for help.
'i' for Ingest circuit states from AI layer.
'l' for Host and SDS Link Status.
'm' for Modification of Host Load Sharing mode.
'r' for sending a circuit Reset.
's' for getting circuit status.
'S' for Switchover of SDS in a Redundant System.
'u' for sending an Unblocking message.
```

'v' for circuit validation test.
'x' to exit program.

Related Information

- **End-of-Sales Announcement for the Cisco VCO/4K Product Line**
 - **Voice Technology Support**
 - **Voice and IP Communications Product Support**
 - **Recommended Reading: Troubleshooting Cisco IP Telephony**
 - **Technical Support & Documentation – Cisco Systems**
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Updated: Feb 02, 2006

Document ID: 14056
