SCCP Protocol

bintec Dm782-I

Copyright© Version 11.00 bintec elmeg

Legal Notice

Warranty

This publication is subject to change.

bintec offers no warranty whatsoever for information contained in this manual.

bintec is not liable for any direct, indirect, collateral, consequential or any other damage connected to the delivery, supply or use of this manual.

Table of Contents

I Related Documents

bintec Dm722-I Telephony over IP

Chapter 1 Introduction

1.1 SCCP Protocol: Description

The Skinny Client Control Protocol (SCCP) is a proprietary terminal control protocol originally developed by Selsius Corporation. It now belongs to Cisco Systems Inc., and defines a messaging set between an IP telephone with a skinny client and a Call Manager.

Skinny is a lightweight signaling protocol, which allows for efficient communication with the server using TCP/IP. The server opens a TCP port (normally port 2000) and receives the events from the registered clients sending, in turn, the responses and commands for these events. Call audio is transmitted using RTP/UDP/IP.

SCCP is a stimulus based protocol and is designed as a communications protocol for clients with very limited hardware regarding the CPU and the memory.

1.2 Functionality available in the router

Our router implements an SCCP server to provide IP telephony functions for Skinny telephones. This simultaneously supports two operating modes.

- When there is a main Call Manager, you can provide IP telephony survival functions for Skinny terminals, which have the *Survival Remote Site Telephony* (SRST) functionality configured. When there are connectivity losses with the Call Manager, the telephones connect to the router and continue executing calls between them, as well as incoming and outgoing calls through the PSTN/ISDN interfaces the device has. It is not necessary to configure the telephone extensions in this mode as the router is capable of ascertaining each of the telephones extensions used with the Call Manager.
- This can also operate autonomously as Call Manager Express. In this case, the router acts as the main Call Manager and you need to configure the extensions associated to each terminal. To do this, configure an SCCP dial-peer with the target equal to the telephone mac and configure a destination-pattern equal to the extension of each telephone line in said dial-peer (see the **target mac** command in the telephony manual: bintec Dm722-I Telephony over IP).

When a telephone is registered in the router, a check is carried out to see if the terminal mac is configured as the **target mac** for a dial-peer. If it is, the configured extensions are assigned; if not this checks (through the telephone) the extensions used with the main Call Manager. In both cases, a dynamic dial-peer is created for each telephone extension.

The following is list of the services provided for these terminals:

- When operating in SRST mode, the terminal extensions and the types of terminals are automatically detected, so you don't have to enter the terminals in the router's configuration.
- Calls between SCCP telephones.
- Calls such as incoming and outgoing Media Gateway SCCP.
- Calls between SCCP telephones and SIP devices.
- Caller/calling name and number identification.
- CDR storing.
- Maintenance of data.
- Call back.
- Receiver and hands free.
- DND key.
- Unconditional call forwarding.
- Call on hold, generating music in PSTN/ISDN interfaces while waiting.
- Ring groups (simultaneously calling various mixed telephones; SCCP, SIP, FXS).
- Hunt groups if busy.
- Pickup groups and directed pickup.
- Call transfer between SCCP terminals.
- Call transfer between SCCP terminals and PSTN/ISDN interfaces.

Chapter 2 SCCP Protocol Configuration

2.1 Configuring the SCCP Protocol

To configure SCCP, enter **protocol sccp** from the general configuration menu.

Syntax:

```
Config>protocol sccp


--  Skinny protocol configuration --
SCCP Config>
```

The options given in the SCCP configuration menu are as follows:

```
SCCP Config>?
  application      Set sccp configuration parameters
  no               Negate a command or set its defaults
  pick-up          Pick-up softkey emulation
  system-message   Set survival system messages
  exit
SCCP Config>
```

2.1.1 [NO] APPLICATION

Configures the global parameters relative to the SCCP protocol operations.

2.1.1.1 [NO] APPLICATION ADDRESS

Configures the IP to be used for the packets sent by the SCCP server. If nothing is configured, the device's internal IP is used.

Syntax:

```
SCCP Config>APLICATION ADDRESS <ip>
SCCP Config>
```

2.1.1.2 [NO] APPLICATION KEEP-ALIVE

Configures the time interval between SCCP clients sending keep-alive packets to the server. In the registration process, the server informs the clients the time configured through this parameter. If a telephone stops sending these messages during a period exceeding said value, the server considers the connection is dead and eliminates it. Default is 2 minutes.

Syntax:

```
SCCP Config>APLICATION KEEP-ALIVE <time>
SCCP Config>
```

2.1.1.3 [NO] APPLICATION PORT

Configures the port where the device SCCP server listens. Default is port 2000.

Syntax:

```
SCCP Config>APLICATION PORT <port-number>
SCCP Config>
```

2.1.1.4 [NO] APPLICATION SERVER

Enables the SCCP server in the device.

Syntax:

```
SCCP Config>APLICATION SERVER
SCCP Config>
```

2.1.2 [NO] IP-TOS

Configures the TOS for the SCCP packets sent by the device. The complete TOS byte is configured through its value in hexadecimal. Default is 0.

Syntax:

```
SCCP Config$ip-tos ?
  <hex 0x0..0xff>    Hexadecimal value in the specified range
```

2.1.3 [NO] SOFTKEY

Telephone soft keys configuration.

2.1.3.1 [NO] SOFTKEY PICKUP

Indicates the digits where the Pickup key stroke is mapped in an SCCP telephone. Pressing this key is the same as pressing the digits configured through this command (so achieving pickup through the Pickup key and a pickup facility dial-peer).

Syntax:

```
SCCP Config>SOFTKEY PICK-UP <telephone>
SCCP Config>
```

Example:

Example configuration so when a Pickup key is pressed on any SCCP telephone, a pickup from peer-group 1 is executed.

```
protocol sccp
     application address 172.24.100.133
     application survival
     softkey pick-up *88
exit
telephony
     ...
     dial-peer 1000 facility
        destination-pattern *88
        target group-pickup peer-group 1
     exit
     ...
exit
```

2.1.3.2 [NO] SOFTKEY MESSAGES

Indicates the digits where the Messages key stroke is mapped in an SCCP telephone. Pressing this key is the same as pressing the digits configured through this command (allowing calls to the voice mail extension).

Syntax:

```
SCCP Config>SOFTKEY MESSAGES <telephone>
SCCP Config>
```

2.1.4 SYSTEM-MESSAGE

Configures the SCCP global messages.

2.1.4.1 [NO] SYSTEM-MESSAGE PRIMARY

Configures the message to be shown on the SCCP telephones when they are registered in the device server.

Syntax:

```
SCCP Config>SYSTEM-MESSAGE PRIMARY <message>
SCCP Config>
```

Chapter 3 SCCP Protocol Monitoring

3.1 Monitoring the SCCP Protocol

3.1.1 Accessing the monitoring prompt

Run **protocol sccp** (root monitoring menu) to access the SCCP monitoring prompt.

```
+PROTOCOL SCCP
SCCP Monitor
SCCP Mon+
```

3.1.2 Monitoring Commands

All the SCCP monitoring commands must be entered at the prompt specified above: SCCP Mon+.

These commands are described below.

3.1.2.1 LIST

Displays information on SCCP.

3.1.2.1.1 LIST REGISTERED

Run **list registered** to view information on the SCCP telephones registered in the device.

Syntax:

```
SCCP Mon+LIST REGISTERED
```

Example:

```
SCCP Mon+LIST REGISTERED
Device Info:
Mac: 000CF174D3BC        Type: CIPC (30016)
Fd:   7 Dnd: off         Address: 172.24.100.130:2047
Queue: 50/50 (available/max)    msg size: 4
        Line:        212       dial-peer: 10003      forward:
        Line:        211       dial-peer: 10002      forward:
        Line:        210       dial-peer: 10001      forward:

SCCP Mon+
```

3.1.2.2 RESTART

Run **restart** to restart one or all the telephones registered in the device.

3.1.2.2.1 RESTART ALL

Restarts all the telephones.

Syntax:

```
SCCP Mon+RESTART ALL
SCCP Mon+
```

3.1.2.2.2 RESTART <mac>

Restarts the telephone with a specified mac address.

Syntax:

```
SCCP Mon+RESTART <mac-address>
SCCP Mon+
```

Chapter 4 Configuration Example

4.1 Configuration example: SRST scenario

Let's assume we have a scenario such as the one in the following figure. This involves a device acting as an office router. Said office has four SCCP telephones and an ISDN line to receive or make calls over the public network.

At the head office, there is a Call Manager with IP address 10.81.32.17, this server being accessible through an IP network.

The aim is when the Call Manager is available, the telephones register in it. This server controls the calls, that is, the router does not intervene. If the Call Manager is unavailable, the SCCP telephones automatically pass to the configured SRST survival server (the router itself). Consequently, calls can be executed between telephones and incoming and outgoing calls over the device's ISDN interface.

In survival mode, when a call comes in over ISDN, all SCCP telephones register in the router ring.
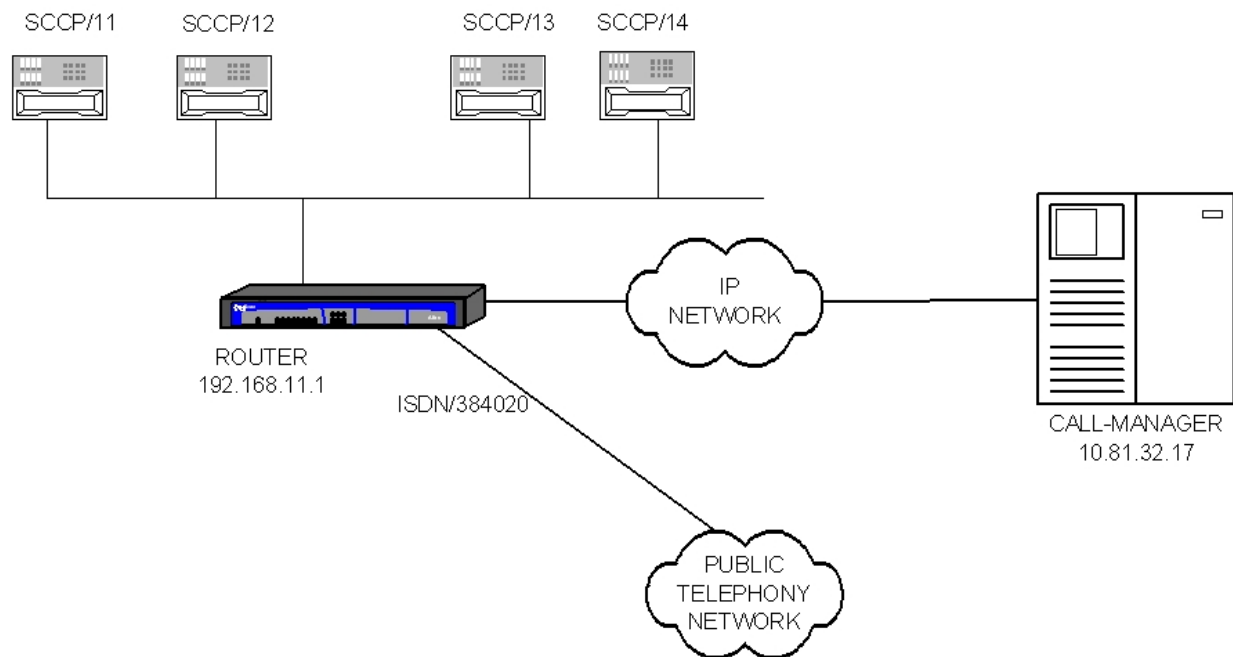
This is the resulting configuration:

```
log-command-errors
no configuration
add device voip-isdn 100
set data-link x25 serial0/0
set data-link x25 serial0/1
set data-link x25 serial0/2
;
global-profiles dial
; -- Dial Profiles Configuration --
   profile audio default
   profile audio inout
   profile audio isdn-type audio
;
exit
;
telephony
; -- Telephony configuration --
    dial-peer 2 voice-port
      description "outgoing public calls in emergency mode "
      destination-pattern 9.......
      destination-pattern 6........
      target voice-port voip100 1
   exit
;
```

```
   dial-peer 30 group
      description "incoming public calls in emergency mode ring every phone"
      destination-pattern 917171717
      target group 1
   exit
;
   peer-group 1
      dynamic-peers
   exit
;
exit
;
;
network ethernet0/0
; -- Ethernet Interface User Configuration --
   ip address 192.168.11.1 255.255.255.0
;
exit
;
;
network voip100
; -- VoIP interface Configuration --
   base-interface
; -- Base Interface Configuration --
      base-interface bri0/0 255 link
      base-interface bri0/0 255 profile audio
      base-interface bri0/0 255 number-of-circuits 1
;
   exit
;
exit
;
protocol ip
; -- Internet protocol user configuration --
   internal-ip-address 192.168.11.1
;
   route 0.0.0.0 0.0.0.0 172.24.100.129
;
;
exit
;
protocol sccp
   application address 192.168.11.1
   application server
   system-message primary "Emergency mode"
exit
;
dump-command-errors
end
; --- end ---
```