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Command Reference Guide

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SmartWare Command Reference Guide

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EU Declaration of Conformity

The EU Directives covered by this Declaration

89/336/EEC	Electromagnetic Compatibility Directive amended by 92/31/EEC & 93/68/EEC
72/23/EEC	Low Voltage Equipment Directive amended by 93/68/EEC

Note: During the transition period, products may not comply with the Low Voltage Directive.

The Products covered by this Declaration

The products covered by this declaration are the SmartNode 1000 and 2000 family series devices.

The Basis on which Conformity is being Declared

The products identified above comply with the requirements of the above EU directives by meeting the following standards:

- Safety compliance: EN 60950
- EMC compliance: EN 55022, EN 55024
- ETSI TBR3 (BRI)
- TBR4 (PRI)

The CE mark was first applied in 2000.

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ABOUT THIS GUIDE

Objective

The objective of this *SmartWare Command Reference Guide* is to provide information concerning the syntax and usage of the command set.
The aim is to enable you to be able to consult a more detailed command description than is given in the *Software Configuration Guide*.
For hardware configuration information refer to the *SmartNode Hardware Installation Guide.*

Intended Audience

The guide is intended primarily for the following audiences:

- Technical staff who are familiar with electronic circuitry, networking theory and have experience as an electronic or electromechanical technician.
- System administrators with a basic networking background and experience, but who might not be familiar with the SmartNode.
- System administrators who are responsible for installing and configuring networking equipment and who are familiar with the SmartNode.

Document Conventions

Inalp documentation uses the conventions listed in Table i below to convey information.

Notice	Description
Note	Helpful suggestion or important information and instructions
Warning	Situation that could cause bodily injury, or equipment damage or data loss
Caution	Situation that could put equipment or data at risk

Table i: Notice Conventions

Document Organization

This document consists of following chapters:

- Command Line Interface
- Operator Execution Mode
- Administrator Execution Mode
- Configure Mode
- System Mode
- IC Voice Mode
- Profile ACL Mode
- Profile Service-Policy Mode
- Source Mode
- Profile NAPT Mode
- Profile Call-Progress-Tone Mode
- Profile Tone-Set Mode
- Profile VoIP Mode
- Context IP Mode
- Interface Mode
- Context CS Mode

- Interface PSTN Mode
- Interface H.323 Mode
- Interface ISoIP Mode
- Gateway H.323 Mode
- Gateway ISoIP Mode
- Port Ethernet Mode
- Port Serial Mode
- Frame Relay Mode
- PVC Mode
- Port ISDN Mode

In addition three appendixes and an index are to be found at the end of the document.

Typographical Conventions

Throughout this guide, we use certain typographical conventions to distinguish elements of commands and examples. In general, the conventions we use conform to those found in IEEE POSIX publications. The following sections summarize our conventions for command and example descriptions.

Command Description

Command descriptions use the following conventions:

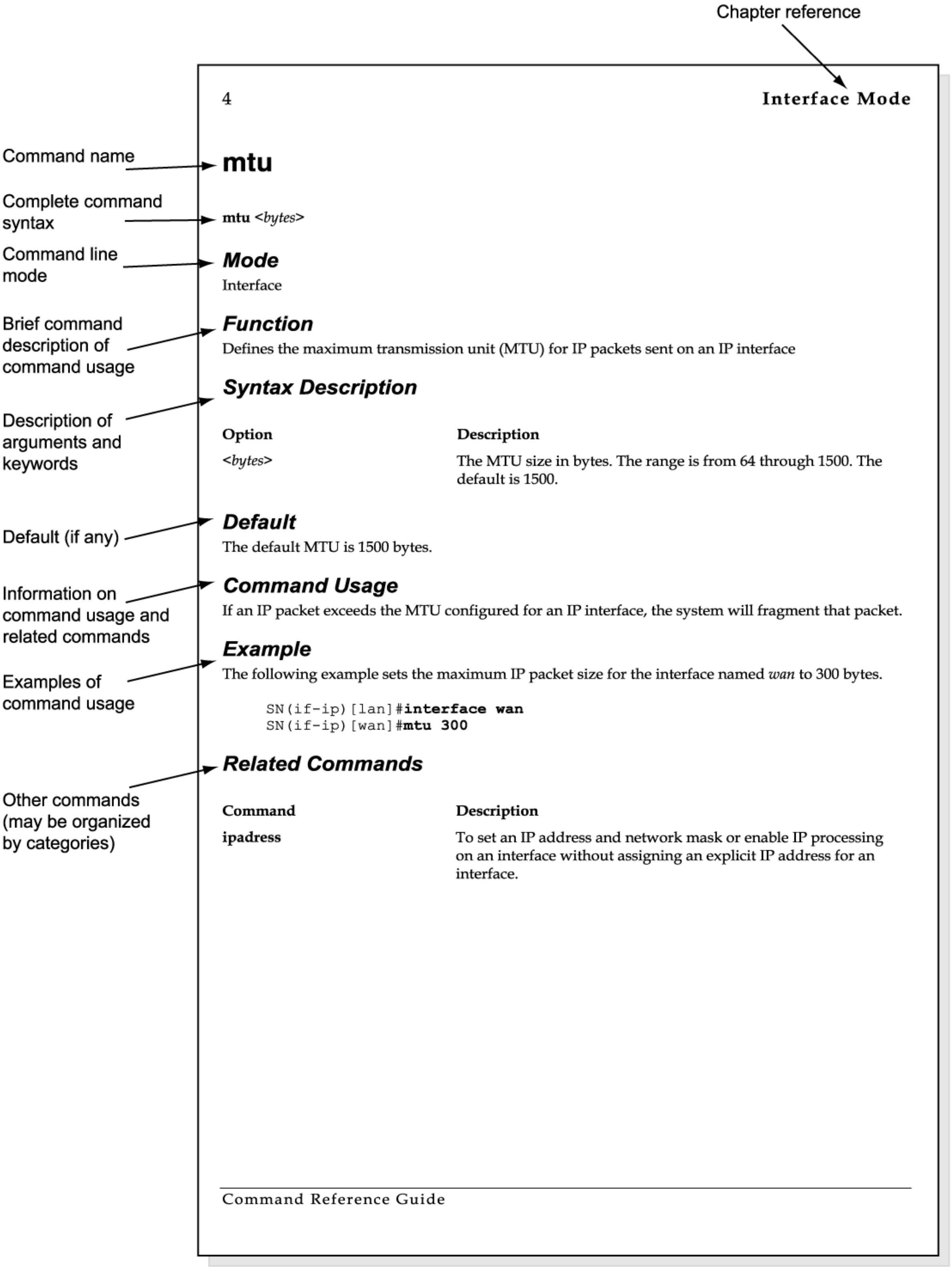
- Commands and keywords are indicated in **boldface** style.
- Arguments where the user supplies the value are indicated in *italics* style and are surrounded by <*angle brackets*>.
- Optional arguments within commands are shown in square brackets ([ ]), alternative parameters within commands are separated by vertical bars (|).
- Alternative but required parameters are shown within grouped braces ({ }) and are separated by vertical bars (|).

Example Description

Examples use the following conventions:

- The style `Terminal` is used for example descriptions.
- System prompts are of the form `SN(mode)#` for interactive sessions. Here `SN` is the currently configured nodename of the device, and `mode` is a string indicating the current configuration mode, if applicable. For example, the prompt in interface mode, assuming an IP interface named `lan`, is `SN(if-ip)[lan]#`.
- Information displayed by the system is in `Terminal` style.
- Information that you should enter is in **`boldface Terminal`** style.

Figure i shows the various fields in a command description.



Chapter reference
Command name
Complete command syntax
Command line mode
Brief command description of command usage
Description of arguments and keywords
Default (if any)
Information on command usage and related commands
Examples of command usage
Other commands (may be organized by categories)

4 Interface Mode

mtu

mtu <*bytes*>

Mode

Interface

Function

Defines the maximum transmission unit (MTU) for IP packets sent on an IP interface

Syntax Description

Option	Description
<*bytes*>	The MTU size in bytes. The range is from 64 through 1500. The default is 1500.

Default

The default MTU is 1500 bytes.

Command Usage

If an IP packet exceeds the MTU configured for an IP interface, the system will fragment that packet.

Example

The following example sets the maximum IP packet size for the interface named *wan* to 300 bytes.

```
    SN(if-ip)[lan]#interface wan
    SN(if-ip)[wan]#mtu 300
```

Related Commands

Command	Description
ipadress	To set an IP address and network mask or enable IP processing on an interface without assigning an explicit IP address for an interface.

Command Reference Guide

Figure i: Command Example

1 COMMAND LINE INTERFACE

1.1 Introduction

The user interface to the SmartWare is called the Command Line Interface (CLI). You can access the CLI either from the console port or through a Telnet session. You can perform all configuration tasks and monitor the SmartWare configuration by the input of commands at the CLI. All CLI commands are simple strings of keywords and user-specified arguments.

This chapter gives an overview of the user interface and the basic features that allow you to navigate the CLI effectively. The following topics are covered:

- Modes and Mode Groups
- Navigating the CLI
- Command Editing
- Syntax Description

1.2 Modes and Mode Groups

1.2.1 Modes

The CLI commands are grouped into *modes*, which are organized hierarchically. A command mode is an environment within which a group of related commands is valid.

All commands are mode-specific, and certain commands are valid in more than one mode. A command mode provides command line completion and context help for the commands within that mode.

1.2.2 Mode Groups

The various modes are organized into *mode groups*. There are two mode groups:

- The **executive mode group**, which contains the modes *operator excution* and *administrator execution.* **Note** that 'execution' is often shortened to 'exec' in the text
- the **configuration mode group**, which contains all of the remaining modes.

Figure ii shows the hierarchy of modes and mode groups.

An overview of the modes, the commands used to enter them and the resulting changes in the CLI prompt is given in Table 1-1.

The operator's current working mode is indicated by the CLI prompt, as described in Chapter 1.2.3, "System Prompt".

1.2.3 System Prompt

In operator execution mode the system prompt is of the form:

```
SN>
```

In the privileged administrator execution mode:

```
SN#
```

In the privileged configuration modes:

```
SN(mode)#
```

Where:

- `SN` is the currently configured name of the node, or the IP address of the node or the hardware type of the device that is being configured, and
- `mode` is a string indicating the current configuration mode as applicable.

Example: The prompt in Port ISDN Mode while configuring the ISDN interface at slot 0 port 0 is shown below.

```
SN(prt-isdn)[0/0]#
```

1.3 Navigating the CLI

1.3.1 Initial Mode

Upon login, the CLI is always in the operator execution mode that is nonprivileged execution, by default. This mode allows the operator to examine the state of the system through a subset of the available CLI commands, but not to configure the system.

1.3.2 System Changes

In order to make configuration changes to the system, administrator execution (privileged execution) modes must be entered. The **enable** command is used for this purpose. Once in administrator execution mode, all of the system commands are available to the privileged user.

1.3.3 Configuration

To make configuration changes the configuration modes must be entered using the **configure** command. From here the other configuration modes are accessible as diagrammed in the overview in Figure ii.

1.3.4 Changing Mode and Exit

Within any configuration mode, the **exit** command brings the user up one level in the mode hierarchy. For example, when in *isdn port configuration* mode, typing **exit** will take you to *configuration mode*. The **exit** command also terminates a CLI session when typed from the operator execution mode.

The **end** command causes the CLI to immediately exit any configuration mode and return to the administrator execution mode. A session can also be terminated using the **quit** command within any mode. To end a session the **logout** command can be used.

Mode Name	Commands Used to Access	Command-Line Prompt
Operator Execution	Operator log on	*SN*>
Administrator Execution	**enable** command from Operator Execution Mode	*SN#*
Configure	**configure** command from Administrator Exececution Mode	*SN*(config)#
System	**system** command from Configure Mode	*SN*(sys)#
IC Voice	**ic voice** <*slot*> command from System Mode	*SN*(ic-voice)[<*slot*>]#
Context IP	**context ip [router]** command from configure mode	*SN*(ctx-ip)[router]#
Interface	**interface** <*name*> command from Context IP Mode	*SN*(if-ip)[<*name*>]#
Context CS	**context cs [switch]** command from Configure Mode	*SN*(ctx-cs)[switch]#
Interface PSTN	**interface pstn** <*name*> command from Context CS Mode	*SN*(if-pstn)[<*name*>]#
Interface ISoIP	**interface isoip** <*name*> command from Context CS Mode	*SN*(if_isoip)[<*name*>]#
Interface H.323	**interface h323** <*name*> command from Context CS Mode	*SN*(if-h323)[<*name*>]#
Gateway ISoIP	**gateway isoip [isoip]** command from Configure Mode	*SN*(gw-isoip)[isoip]#
GatewayH.323	**gateway h323 [h323]** command from Configure Mode	*SN*(gw-h323)[h323]#
Port Ethernet	**port ethernet** <*slot*> <*port*> command from Configure Mode	*SN*(prt-eth)[<*slot*/<*port*>]#
Port Serial	**port serial** <*slot*> <*port*> command from Configure Mode	*SN*(prt-ser)[<*slot*/<*port*>]#
Frame Relay	**framerelay** command from Port Serial Mode	*SN*(frm-rel*)*[<*slot*/<*port*>]#
PVC	**pvc** <*dlci*> command from Frame Relay Mode	*SN*(pvc)[<*dlci*>]#
Port ISDN	**port isdn** command from Configure Mode	*SN*(prt-isdn)[<*slot*/<*port*>]#
Profile ACL	**profile acl** <*name*> command from Configure Mode	*SN*(pf-acl)[<*name*>]#
Profile NAPT	**profile napt** <*name*> command from Configure Mode	*SN*(pf-napt)[<*name*>]#
Profile Service-Policy	**profile policy-map** <*name*> command	*SN*(pf-srvpl)[<*name*>]#

Mode Name	Commands Used to Access	Command-Line Prompt
	from Configure Mode	
Source	**source {class|policy}** <*name*> command from Profile Service-Policy Mode	*SN*(src)[<*name*>]#
Profile VoIP	**profile voip** <*name*> command from Configure Mode	*SN*(pf-voip)[<*name*>]#
Profile Tone-Set	**profile tone-set** <*name*> command from Configure Mode	*SN*(pf-tones)[<*name*>]#
Profile Call-Progress-Tone	**profile call-progress-tone** command from Configure Mode	*SN*(pf-callp)[<*name*>]#

Table 1-1: Modes, their Access Commands and corresponding Prompts

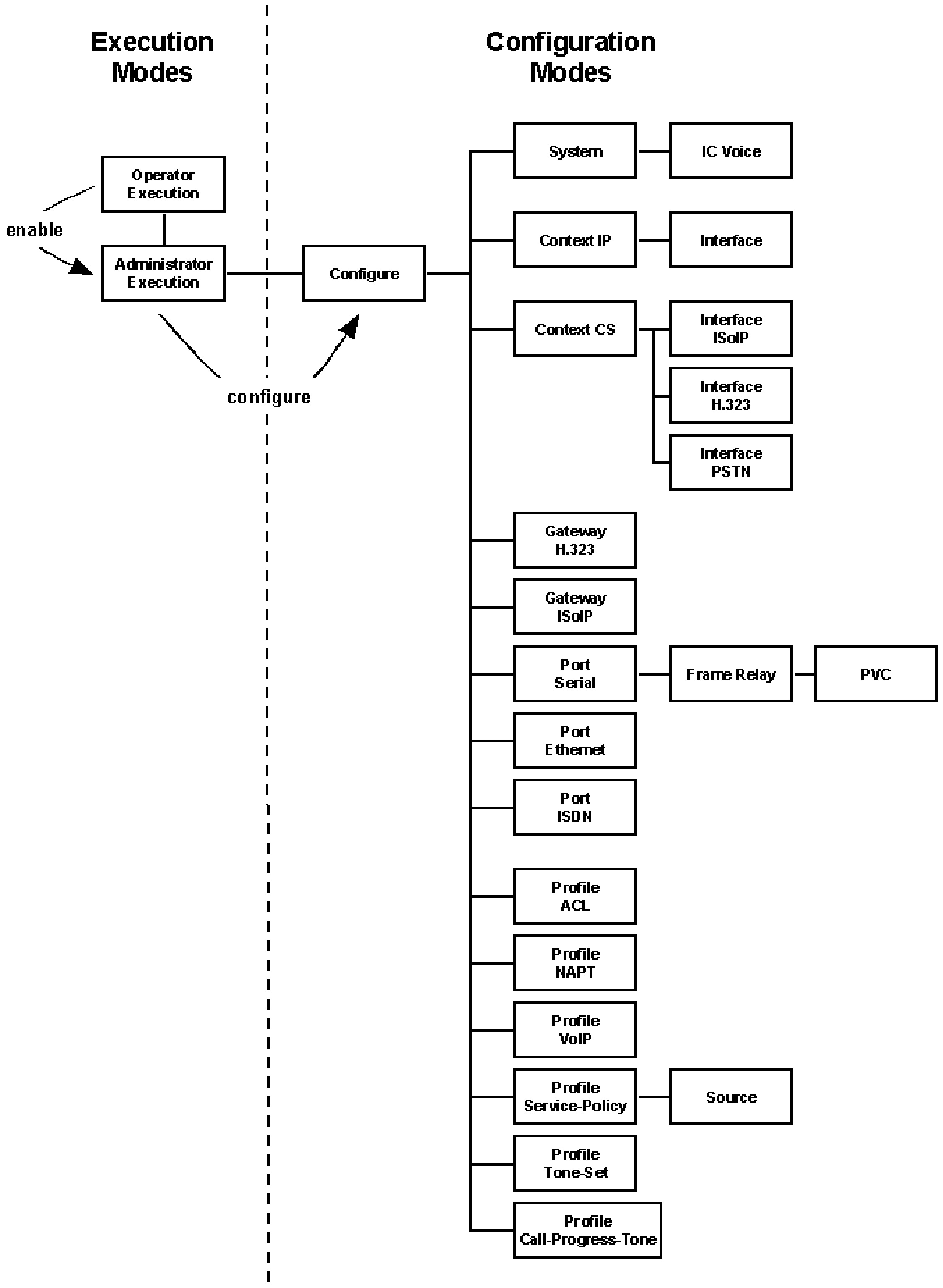


Figure ii: Mode Hierarchy

1.4 Command Editing

1.4.1 Command Help

To see a list of all CLI commands available within a mode, type a question mark (**?**) at the system prompt in the mode of interest. A list of all available commands is displayed. Commands that have

become available in the current mode are displayed at the bottom of the list, separated by a line. Commands from higher hierarchy levels are listed at the top.
You can also type the question mark while in the middle of entering a command. Doing so displays the list of allowed choices for the next keyword in the command. Liberal use of the question mark function is an easy and effective way to explore the command syntax.

1.4.2 Command No Form

Almost every command supports the keyword **no**. Typing the **no** keyword in front of a command disables the function or “cancels” a command’s effect from the configuration.

Example: To enable send RIP on an interface, enter the command **rip supply**.
To disable send RIP on an interface and remove the command’s effect from the configuration, enter the command **no rip supply**.

1.4.3 Command Completion

You can use the Tab key in any mode to carry out command completion. Partially typing a command name and pressing the Tab key causes the command to be displayed in full up to the point where a further choice has to be made. In all modes, the system recognizes and accepts partially typed command keywords, provided a sufficient amount has been entered to uniquely recognize it.
For example, rather than typing **configur**e, typing **conf** causes the CLI to enter configuration mode. However, if you entered the string **co**, an error would be returned because insufficient characters have been entered to distinguish between the **configure** command and the **copy** command.
Automatic pagination of output at the command line interface for console and Telnet sessions is supported. SmartWare displays `-More-` to indicate the presence of more output. You can use a subset of the commands available in the UNIX **more** command, such as pressing **space** to show the next page of output, typing **q** to quit, pressing **enter** to show one additional line of output, and so on.

1.4.4 Command History

SmartWare maintains a list of previously entered commands that you can step through by pressing the **up-arrow** and **down-arrow** keys, and then pressing **enter** to enter the command. In addition, SmartWare also supports Emacs-style command editing.

Keyboard Shortcut	**Description**
Ctrl-p and <up-arrow>	Recall previous command in the command history.
Ctrl-n and <down-arrow>	Recall next command in the command history.
Ctrl-f and <right-arrow>	Move cursor forward one character.
Ctrl-b and <left-arrow>	Move cursor backward one character.
Esc-f	Move cursor forward one word.
Esc-b	Move cursor backward one word.
Ctrl-a	Move cursor to beginning of line.
Ctrl-e	Move cursor to end of line.
Ctrl-k	Delete to end of line.
Ctrl-u	Delete to beginning of line.
Ctrl-d	Delete character.
Esc-d	Delete word.

Keyboard Shortcut	Description
Ctrl-c	Quit editing the current line.
Ctrl-l	Refresh (redraw) the display.
Ctrl-t	Transpose characters.

Table 1-2: Command Edit Shortcuts

1.4.5 Command Editing Shortcuts

The SmartWare CLI provides a number of Emacs-Style command shortcuts that facilitate editing of the command line. Table 1-2 summarizes the available command editing shortcuts. The syntax **Ctrl-p** means press the **p** key while holding down they keyboard's **Control** key (sometimes labeled **Ctl** or **Ctrl**, depending on the keyboard and operating system of your computer). Similarly, **Esc-f** means holding down the **Escape** key (often labeled **Esc** on many keyboards) then typing the **f** key.

1.4.6 Command Confirmation

The **reload** and **logout** commands require you to confirm their actions before they are accepted.

1.5 Basic User Interface Commands

This section describes the basic commands you use to display brief system help and to exit a current command line mode and return to the next highest level within the same mode. These commands are available in both the operator (nonpriviledged) execution and administrator (priviledged) execution command modes.

?, help

? | help

Function

Displays brief system help on the available commands or command options. Help is available on commands and parameters as follows:

- Context sensitive help, by leaving the cursor in position and pressing the '?' key.
- By pressing '?' on an empty line, a list of those commands that are available in the current working mode is shown.

Syntax Description

This command has no keywords or arguments.

Default

None

Mode

Both commands are available in all execution and configuration modi.

Command Usage

Help can be requested at any point in a command by entering a question “?” mark.

To list all valid commands available in the current mode, enter a question mark “?” at the system promt.

To list the asscociated keywords or arguments for a command, enter the question mark “?” in place of a keyword or argument on the command line. This form of help is called *command syntax help*, because it lists the keywords or arguments that apply to the command based on the command command, keywords, and arguments you have already entered.

To obtain a list of commands that beginn with a particular character string, enter the first few characters of the command a press the tabulator key to list all commands that match.

Examples

The following example shows how to display the commands available in operator execution mode.

```
SN>?
  call                        Call operations
  clear                       Clears the screen
  debug                       Enables/Disables debug monitors
  enable                      Enters administration execution mode
  exit                        Brings you up one hierarchy
  fg                          Resumes a suspended command
  help                        Displays help
  jobs                        Displays the current running commands
  logout                      Terminates session
  ping                        Verifies if another IP host is reachable
  show                        Displays system information
  su                          Changes login identity
  who                         Shows your identity
```

The following example shows how to use command syntax help to display the next argument of a partially complete static route command.

```
SN(ctx-ip)[router]#route ?
  <A.B.C.D>                   Destination network/host IP address
SN(ctx-ip)[router]#route
```

The last example shows the information the system displays after entering the help command in the IP router context.

```
SN(ctx-ip)[router]#help
Help is available on commands and parameters as follows:
1. Context sensitive help, by leaving the cursor in position and
   pressing the '?' key.
2. By pressing '?' on an empty line, a list of those commands that
   are available in the current working mode is shown.

SN(ctx-ip)[router]#
```

Related Commands

None

exit

exit

Function

Exits the current configuration mode and returns to the next highest level configuration mode. At the operator or administrator execution prompt, closes an active Telnet or console session and terminates the command shell.

Syntax Description

This command has no keywords or arguments.

Default

None

Mode

The exit command is available in all execution and configuration modi.

Command Usage

If you enter the exit command at the operator or administrator execution prompt in a Telnet or console session, you will terminate the command shell, log off of the SmartNode, and terminate the Telnet or console session.

Warning: At the operator or administrator execution prompt the exit command, closes an active Telnet or console session and terminates the command shell without any user inquiry.

Example

The following examples shows how an administrator uses the exit command to return from the onfiguration mode for an IP interface LAN to the next highest level, which is the context IP mode.

```
SN(if-ip)[LAN]#exit
SN(ctx-ip)[router]#
```

Related Commands

None

2 OPERATOR EXECUTION MODE

2.1 Command Overview

This chapter describes in detail all the commands that are available to a system operator.

The commands that are available in this mode are listed in Table 2-1 below:

Command	Description
call	Call operations
clear	Clears the screen
debug call	Enables or disables call application debug monitor
help	Displays help text
jobs	Displays the current running commands
fg	Resumes a suspended command
logout	Terminates session
ping	Verifies if another IP host is reachable
show call	Displays call application information
show clock	Displays current system date and time
show dsp	Display DSP information
show framerelay	Displays framerelay informations
show history	Displays command line history
show ip interface	Displays ip interface information
show ip route	Displays IP route information
show log	Displays system log
show napt interface	Displays NAPT usage of an IP interface
show port ethernet	Displays port ethernet informations
show port isdn	Displays ISDN information
show port serial	Displays port serial informations
show profile call-progress-tone	Display information about call-progress tones
show profile tone-set	Display information about tone sets
show profile voip	Display information about voip profiles
show rip	Displays RIP information
show service-policy	Displays link arbitration status
show uptime	Shows time since last restart
show version	Displays version information
show version cli	Displays CLI version
su	Changes login identity
who	Shows users currently logged in

Table 2-1: Commands available in Operator Execution Mode

call

```
[no] call { ( <callkey>
    { (dial <interface> [ <called-party> [ <calling-party> ] ] ) | (o verlap <called-party> ) |
    accept |
    drop |
    ( display <display-data> ) | ( keypad <keypad-data> ) | ( user <user-data> ) |
    hold | ( suspend [ <parkcode> ] ) |
    retrieve | ( resume [ <parkcode> ] ) } ) |
    autoaccept | ( bearer-capability { audio | speech | digital } ) |
    ( { called-numbering-plan | calling-numbering-plan } { e164 | private } ) |
    ( { called-type-of-number | calling-type-of-number } { unknown | national | international |
    subscriber } ) }
```

Function

Call operations

Syntax Description

Option	Description
<callkey>	Call identification number (hexadecimal)
dial	Opens a call
<interface>	Destination interface name
<called-party>	Called party number or '-' for none
<calling-party>	Calling party number
overlap	Overlap sending
<called-party>	Called party number digits
accept	Accepts an incoming call in the alerting state
drop	Drops the call
display	Sends an info message with a display IE appended
<display-data>	Data to send in the display information element
keypad	Sends an info message with a keypad info IE appended
<keypad-data>	Keypad information to send
user	Sends an info message with a user-to-user IE appended
<user-data>	User-to-user information to send
hold	Sends a hold message
suspend	Sends a suspend message
<parkcode>	Defines the parkcode to be used in the suspend message
retrieve	Sends a retrieve message
resume	Sends a resume message
<parkcode>	Defines the parkcode to be used in the suspend message

autoaccept	Enables automatic accepting of incoming calls
bearer-capability	Defines the bearer-capability for outgoing calls
audio	Sets bearer-capability to 3.1kHz audio
speech	Sets bearer-capability to speech
digital	Sets bearer-capability to unrestricted digital (64kBit/s)
called-numbering-plan	Defines the numbering plan to use for the called number
calling-numbering-plan	Defines the numbering plan to use for the calling number
e164	Sets the numbering plan to E.164/ISDN
private	Sets the numbering plan to private
called-type-of-number	Defines the called party's type-of-number
calling-type-of-number	Defines the calling party's type-of-number
unknown	Sets the type of number to unknown
national	Sets the type of number to national
international	Sets the type of number to international
subscriber	Sets the type of number to subscriber

Default

The following default values for optional values are set:

Called-numbering-plan	E.164/ISDN
Calling-numbering-plan	E.164/ISDN
Called-type-of-number	unknown
Calling-type-of-number	unknown
Auto-accept	disabled

Mode

Operator Execution

Command Usage

The call command is used to place and accept calls for debugging purposes. It supports also several parameters, which define the details of the call to be established or accepted.

Example

The following example shows how to use the command to place an outgoing call:

```
SN>call 3 dial isdn3 0311234567 323
```

The next example accepts an incoming call, which is already alerting:

```
SN>call 8003 accept
```

Related Commands

Command	**Description**

debug call	Enables the call application monitor to see the responses
debug session-control	Enables the session-control monitor to see its activities

clear

clear

Function

Clears the screen

Syntax Description

Option	**Description**
This command has no keywords or options	

Default

None

Mode

Operator Execution

Command Usage

Clears the screen of the terminal window you are currently logged in.

Example

The following example clears the screen of the current terminal window:

```
SN>clear
```

Related Commands

None

debug call

[no] debug call [*<detail>* **]**

Function

Enables or disables call application debug monitor

Syntax Description

Option	**Description**
<detail>	Detail level

Default

None

Mode

Operator Execution

Command Usage

This monitor is used in conjunction with the call command to see the responses to call application activities.

Example

The following example shows how to enable the monitor:

```
SN>debug call
```

The next example shows how to disable the monitor:

```
SN>no debug call
```

Related Commands

Command	**Description**
call	Establishes or accepts calls for debugging purposes
debug session-control	Enables the session-cntrol monitor

jobs

jobs

Function

Displays the current running commands

Syntax Description

Option	Description
This command has no keywords or options	

Default

None

Mode

Operator Execution

Command Usage

This command displays a list of current running CLI commands. Most of the configuration commands terminate immediately after configuring the system. However there are some commands that need some time to finish. Ping is one of them. Pressing Ctrl-Z can suspend a command like this, and the prompt is reprinted. Now the command continues running in the background. The `jobs` command lists all command that run in fore- or background.

Example

The following example starts a ping process. After three replies the operator presses Ctrl-Z. The ping command continues in background and the prompt is reprinted. The invocation of the `jobs` command displays a list of all running commands:

```
SN>ping 172.16.1.10
Sending 10 ICMP echo requests to 172.16.1.10, timeout is 1 seconds:
Reply from 172.16.1.10: Time 20ms
Reply from 172.16.1.10: Time 10ms
Reply from 172.16.1.10: Time 10ms
% Suspended
```

At this point the operator presses Ctrl-Z

```
NOD_032_010(cfg)#Reply from 172.16.1.10: Time 10ms
Reply from 172.16.1.10: Time 10ms
```

Now, the operator displays a list of all running commands using the **jobs** command

```
jobs
   * [run ] jobs
   0 [bg  ] ping
NOD_032_010(cfg)#Reply from 172.16.1.10: Time 10ms
Reply from 172.16.1.10: Time 10ms
Reply from 172.16.1.10: Time 10ms
Reply from 172.16.1.10: Time 10ms
Reply from 172.16.1.10: Time 10ms
Ping statistics for 172.16.1.10:
  Packets: Sent 10, Received 10, Lost 0 (0% loss),
  RTT:     Minimum 10ms, Maximum 20ms, Average 11ms
% Done [ping]
```

On the last line above the **ping** command in background is finished

Related Commands

Command	**Description**
fg	Resumes a suspended command

fg

fg <*job*>

Function

Resumes a suspended command

Syntax Description

Option	**Description**
<*job*>	Job ID of the command to be resumed. The job ID is displayed by the **jobs** command.

Default

None

Mode

Operator Execution

Command Usage

This command resumes a suspended command. Most of the configuration commands terminate immediately after configuring the system. However there are some commands that need some time to finish. Ping is one of them. Pressing Ctrl-Z can suspend a command like this, and the prompt is reprinted. Now the command continues running in the background. The **fg** command resumes a background command and brings it to foreground again.

Example

The following example starts a ping process. After three replies the operator presses Ctrl-Z. The ping command continues in background and the prompt is reprinted. The invocation of the **jobs** command displays a list of all running commands. The ping command has job ID 0 and is resumed using the **fg** command.

```
SN>jobs fg
Sending 10 ICMP echo requests to 172.16.1.10, timeout is 1 seconds:
Reply from 172.16.1.10: Time 20ms
Reply from 172.16.1.10: Time 10ms
Reply from 172.16.1.10: Time 10ms
```

At this point the operator presses Ctrl-Z

```
% Suspended
NOD_032_010(cfg)#Reply from 172.16.1.10: Time 10ms
Reply from 172.16.1.10: Time 10ms
```

Now, the operator displays a list of all running commands using the **jobs** command

```
jobs
   * [run ] jobs
   0 [bg  ] ping
```

```
NOD_032_010(cfg)#Reply from 172.16.1.10: Time 10ms
Reply from 172.16.1.10: Time 10ms
```

Finally, the operator resumes the ping command with job ID 0

```
fg 0
% Resumed [ping]
Reply from 172.16.1.10: Time 10ms
Reply from 172.16.1.10: Time 10ms
Reply from 172.16.1.10: Time 10ms
Ping statistics for 172.16.1.10:
  Packets: Sent 10, Received 10, Lost 0 (0% loss),
  RTT:     Minimum 10ms, Maximum 20ms, Average 11ms
```

Related Commands

Command	**Description**
jobs	Displays the current running commands

logout

logout

Function

Terminates session

Syntax Description

Option	**Description**
This command has no keywords or options	

Default

None

Mode

Operator Execution

Command Usage

This command logs off the system and terminates the current CLI session.

Example

The following example a user logs off the system:

```
SN>logout
Press 'yes' to logout, 'no' to cancel : yes
Goodbye
```

Related Commands

Command	**Description**
exit	Exits the current mode

ping

ping <*address*> **[** <*number*> **] [timeout** <*seconds*> **]**

Function

Verifies if another IP host is reachable

Syntax Description

Option	Description
<*address*>	IP address of the host to ping in the form A.B.C.D.
<*number*>	Optional. The number of ping packets to send. The valid range is 1 to 10000; the default is 5.
timeout	To specify the time to wait for a response.
<*seconds*>	Optional. Time in seconds to wait for a response. The valid range is 1 to 100; the default is 1.

Default

This command sends five ping packets to the specified host, using a timeout value of one second.

Mode

Operator Execution

Command Usage

Ping is a diagnostic tool widely used to test and debug network connectivity. Ping sends ICMP echo request packet to the specified host and expects ICMP echo reply packets from the host within the specified timeout. The command repeats this action as many times as you specified with the <*number*> option.

Example

The following example shows the common usage of ping:

```
    SN>ping 172.16.1.10
```

The next example shows a more extended usage of ping. The command sends 10 ping packets to the host and for each expects an answer within 2 seconds:

```
    SN>ping 170.16.1.10 10 timeout 2
```

The output of the ping command depends whether the host is reachable or not and whether the host is up and answers to the ping packets.

If the network could not find a route to the specified host, the ping command produces the following output:

```
SN>ping 172.16.1.10
% No route to host
```

If the network could find a route to the specified host, but the host does not answer (e.g. because it is switched off), the ping reports that it did not receive a reply for each sent ping packet:

```
SN>ping 172.16.1.10
Sending 5 ICMP echo requests to 172.16.1.10, timeout is 1 seconds:
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Ping statistics for 172.16.1.10:
  Packets: Sent 5, Received 0, Lost 5 (100% loss),
```

If the host is reachable and responds to the ping packets, the ping command prints out the round-trip-delay between the pinging source and the pinged target host:

```
SN>ping 172.16.1.10
Sending 5 ICMP echo requests to 172.16.1.10, timeout is 1 seconds:
Reply from 172.16.1.10: Time 20ms
Reply from 172.16.1.10: Time 20ms
Reply from 172.16.1.10: Time 30ms
Reply from 172.16.1.10: Time 20ms
Reply from 172.16.1.10: Time 20ms
Ping statistics for 172.16.1.10:
  Packets: Sent 5, Received 5, Lost 0 (0% loss),
  RTT:     Minimum 20ms, Maximum 30ms, Average 22ms
```

Related Commands

None

show call

show call { config | sessions } [<*detail*> **]**

Function

Displays call application information

Syntax Description

Option	**Description**
config	Displays the call-application configuration
sessions	Displays information about running call application sessions
<*detail*>	Detail level that is a value in the range from 0 to 5

Default

None

Mode

Operator Execution

Command Usage

This command is used to display the actual running call application sessions.

Example

The following examples displays the call-application configuration:

```
SN>show call config
```

The next example displays information about running call application sessions:

```
SN>show call sessions 5
```

Related Commands

None

show clock

show clock

Function

Displays current system date and time

Syntax Description

Option	**Description**
clock	Displays current system date and time in the format yyyy-mm-ddThh:mm:ss

Default

None

Mode

Operator Execution

Command Usage

This command displays the current system date and time.

Example

The following example displays the current system date and time:

```
SN>show clock
2002-04-29T15:23:24
```

Related Commands

Command	**Description**
clock set	Sets the system clock
sntp-client	Start/stop/configure SNTP client

show dsp

show dsp { *<slot>* **| (statistics** *<slot>* **) | (channel statistics** *<slot>* **) | (sw-version** *<slot>* **) | (test-result** *<slot>* **) }**

Function

Display DSP information

Syntax Description

Option	**Description**
dsp	Display DSP information
<slot>	The number of the slot
statistics	Displays DSP device statistics
<slot>	The number of the slot
channel	Displays DSP channel information
statistics	Displays DSP channel statistics
<slot>	The number of the slot
sw-version	Displays DSP software version of the current DSP code
<slot>	The number of the slot
test-result	Displays DSP self test results of the last test performed
<slot>	The number of the slot

Default

None

Mode

Operator Execution

Command Usage

This command is used to verify DSP configuration, to verify the DSP software version running and to verify the latest self-test result.

Warning: DSP statistics can only be read with special software!

Example

The following examples display DSP information on slot 0 and the latest DSP self test result on slot 1:

```
SN>show dsp 0
SN>show dsp test-result 1
```

Related Commands

None

show framerelay

show framerelay [pvc *<print-dlci>* **]**

Function

Displays Frame Relay informations

Syntax Description

Option	Description
pvc	Displays Frame Relay PVC informations
<print-dlci>	Enter DLCI

Default

None

Mode

Operator Execution

Command Usage

Since Frame Relay configuration for the serial interface is complex and requires many commands, it is helpful to list the frame relay configuration on screen.

Example

The following example displays the Frame Relay configuration settings for the serial interface.

```
SN>port serial 0 0
SN(prt-ser)[0/0]# show framerelay

Framerelay Configuration:
Port           LMI-Type       Keepalive      Fragmentation
-----------------------------------------------------------
serial 0 0 0   ansi           10             enabled

PVC Configuration:
Port           DLCI      State     Encaps    Binding
-----------------------------------------------------
serial 0 0 0   1         open      rfc1490   wan@router
```

Related Commands

None

show history

show history

Function

Displays command line history

Syntax Description

Option	Description
history	Displays command line history

Default

None

Mode

Operator Execution

Command Usage

Shows the last commands that have been entered in the current session. Each session features its own command history. The last command entered is shown as the last entry in the list.

Example

This example shows the output of the command after the commands **who**, **enable** and **help** have been entered.

```
SN>show history
who
enable
help
show history
```

Related Commands

None

show ip interface

show ip interface [*<interface_name>* **] [router]**

Function

Displays IP interface information

Syntax Description

Option	Description
<interface_name>	IP interface name
router	Predefined IP context named *router*

Default

None

Mode

Operator Execution

Command Usage

SmartWare contains the **show ip interface** command, which displays IP information for all IP interfaces.

Example

The following example shows how to display IP information for all interfaces using the **show ip interface** command from operator execution mode.

```
SN>show ip interface
------------------------------------------------------------
Context:                  router
Name:                     lan
IP Address:               172.16.40.77 255.255.0.0
MTU:                      1500
ICMP router-discovery:    enabled
ICMP redirect:            send only
State:                    OPENED
Binding:                  ethernet 0 0 0/ethernet/ip

------------------------------------------------------------
Context:                  router
Name:                     wan
IP Address:               172.17.100.210 255.255.255.0
MTU:                      1500
ICMP router-discovery:    enabled
ICMP redirect:            send only
State:                    CLOSED
Binding:                  ethernet 0 0 1/ethernet/ip
...
```

Related Commands

None

show ip route

show ip route

Function

Displays IP route information

Syntax Description

Option	Description
This command has no keywords or options	

Default

None

Mode

Operator Execution

Command Usage

This command displays the entire routing table used for IP data forwarding.

Example

The following is an example of the command:

```
SN>show ip route
Routes of IP context 'router':
Status codes: * valid, U up, H host, G Gateway, L local, D default
  Destination         Nexthop          Protocol  Metric  Flags      Used
---------------------------------------------------------------------
* 127.0.0.1/32                         local        0    LHG         n/a
* 172.19.32.10/32                      local        0    LHG         n/a
* 172.19.33.10/32                      local        0    LHG         n/a
* 172.19.32.0/24      eth01            local        1    UL            0
* 172.19.33.0/24      eth00            local        1    UL            5
* 172.19.41.0/24      172.19.33.250    static       0    U             0
* 172.19.49.0/24      172.19.33.250    static       0    U             0
* 0.0.0.0/0           172.19.32.2      static       1    UD          437
```

The `Destination` column displays the destination of the route, i.e. the destination network and the prefix length. The `Nexthop` column shows, which is the next hop host or IP interface for packets to this destination. The `Protocol` column informs you about the routing protocol that added this entry: `local` are routes that are automatically added for each local numbered IP interface; `static` routes are added with the **`route`** command; `rip` routes were added by the Routing Information Protocol (RIP). The `Metric` column displays the weight of the route. Lower metric values are more important to the router. The flags are explained in the header of the output. The `Used` column shows how many times the forwarder performed a route lookup for a specific route. The * before a route displays that it is currently active. Inactive routes are not taken into account by the router.

Related Commands

Command	Description
route	Configures static IP routes
rip	Configures the routing information protocol

show log

show log [event | reset]

Function

Displays system log

Syntax Description

Option	**Description**
event	Specifies that the event log is displayed. The event log contains system errors, warnings and informational messages.
reset	Specifies that the reset log is displayed. The reset log contains reset causes.

Default

None

Mode

Operator Execution

Command Usage

This command displays either the event or the reset log. The event log contains system errors, warings and informational messages that can occur asynchronously, i.e. not as immediate response to an entered command. It is highly recommended to display this log if one of the services does not work as expected.
The reset log displays the reset time and cause of the last few system resets. This can e.g. be power off/on, manual reload, etc.

Example

The following example shows an example event log:

```
SN>show log event
2002-04-26T16:16:10 : LOGINFO    : Slot 2: DSP driver for AC481xx
                                     created.
2002-04-26T16:16:10 : LOGINFO    : Slot 2: IC-E1VOIP card booted
                                     successfully.
2002-04-26T16:16:29 : LOGINFO    : Slot 3: DSP driver for AC481xx
                                     created.
2002-04-26T16:16:29 : LOGINFO    : Slot 3: IC-E1VOIP card booted
                                     successfully.
2002-04-26T16:16:32 : LOGINFO    : CLI: Registered XML specification
                                     /flash/cli/spec.xml
2002-04-26T16:16:40 : LOGINFO    : H.323_GW: Successfully started
                                     with 40 DSP channels.
2002-04-26T16:16:41 : LOGINFO    : Link down on interface eth00.
2002-04-26T16:16:41 : LOGINFO    : Link up on interface eth00.
2002-04-26T16:16:41 : LOGINFO    : Link down on interface eth01.
2002-04-26T16:16:41 : LOGINFO    : Link up on interface eth01.
```

```
    2002-04-26T16:16:59 : LOGINFO    : Warm start.
```

The next example displays the output of a typical reset log:

```
    SN>show log reset
    2002-04-18T15:06:38 : Target Shell
    2002-04-18T20:58:30 : SW Watchdog:
    2002-04-19T09:45:04 : Target Shell
    2002-04-19T10:54:40 : Target Shell
    2002-04-19T13:33:41 : Target Shell
    2002-04-25T14:44:12 : Target Shell
    2002-04-25T15:04:08 : Target Shell
    2002-04-26T14:46:06 : Target Shell
    2002-04-26T16:16:29 : Target Shell
```

Related Commands

None

show napt interface

show napt interface *<ip_interface>* **[** *<ip_context>* **]**

Function

Displays NAPT information and usage of an IP interface

Syntax Description

Option	Description
<ip_interface>	Name of the IP interface for which NAPT usage shall be displayed
<ip_context>	Context of the IP interface for which NAPT usage shall be displayed

Default

The default IP context is router.

Mode

Operator Execution

Command Usage

This command displays the NAPT usage of the specified IP interface. If the specified IP interface uses a NAPT profile, the global IP interface and information about the bound NAPT profile is displayed.

Example

The following example displays NAPT usage information about the global IP interface *access*.

```
SN>show napt interface access router
Interface global-if (IP context router):
----------------------------------------
  Bound to profile:    default

NAPT profile default:
---------------------
  Bound to interface:  router/access
  ICMP default server: (none)

  Protocol        Port  Destination Host
  --------------- ----- ----------------
  tcp                80 10.1.1.1
  tcp                23 10.1.1.1
```

The IP interface *access* is bound to the NAPT profile default, which is also displayed.

Related Commands

Command	Description
show profile napt	Displays NAPT profile information
profile napt	Network Address Port Translation profile
use profile napt	Lets a global IP interface use a NAPT profile

show port ethernet

show port ethernet [*<print-slot> <print-port>* **]**

Function

Displays port Ethernet informations

Syntax Description

Option	**Description**
<print-slot>	Ethernet slot number
<print-port>	Ethernet port number

Default

None

Mode

Operator Execution

Command Usage

The command show port ethernet is used to get detailed information for a selected Ethernet port. Since an Etnernet port has to be enabled for use, the respective port has to be in the OPENED state. If for any reason an Ethernet port is not accessible, first check that it is in the OPENED, and not in the CLOSED state. Other information which could be necessary is the MAC address, speed or transmission rate settings, encapsulation, and frame format, which all are listed on the screen.

Example

The following example shows how to display information, for Ethernet port on slot 0 and port 0 of a SmartNode:

```
SN>show port ethernet 0 0

Ethernet Configuration
-------------------------------------

Port           : ethernet 0 0 0
State          : OPENED
MAC Address    : 00:30:2B:00:0B:0C
Speed          : 10MBit/s
Duplex         : Half
Encapsulation  : ip
Binding        : access@router
Frame Format   : standard
Default Service: 0
```

Related Commands

None

show port isdn

show port isdn [*<detail>* **]**

Function

Displays ISDN information

Syntax Description

Option	Description
<detail>	Detail level as value in the range from 0 to 5

Default

By default detail level 0 is used, if not other specified.

Mode

Operator Execution

Command Usage

The command displays ISDN port specific information like configured protocols and operational state.

Example

The following example displays the information about all ISDN ports of a SmartNode 1200:

```
SN>show port isdn 5
SLOT:00 PORT:00  BRA - STATE:ACTIVE - LAYER1:DOWN
  L3PROT:DSS1 IFACE:USR L2PROT:PT-MPT
  REQUESTED STATE : ACTIVE
SLOT:00 PORT:01  BRA - STATE:ACTIVE - LAYER1:DOWN
  L3PROT:DSS1 IFACE:NET  L2PROT:PT-MPT
  REQUESTED STATE : ACTIVE
```

Related Commands

None

show port serial

show port serial [*<print-slot> <print-port>* **]**

Function

Displays port serial information

Syntax Description

Option	Description
<print-slot>	Serial slot number
<print-port>	Serial port number

Default

None

Mode

Operator Execution

Command Usage

This command is used to displays port serial information.

Example

The following example shows information for the serial interface on slot 0 and port 0 of a SmartNode 2300:

```
SN>port serial 0 0
SN(prt-ser)[0/0]#show port serial

Serial Interface Configuration
------------------------------

Port            : serial 0 0 0
State           : CLOSED
Hardware Port   : X.21
Port Type       : DTE
CRC Type        : CRC-16
Max Frame Length: 2048
Recv Threshold  : 1
Encapsulation   : framerelay
```

Related Commands

None

show profile call-progress-tone

show profile call-progress-tone [<*name*> **]**

Function

Display information about configured call-progress tones

Syntax Description

Option	**Description**
<*name*>	Call-progress tone name

Default

None

Mode

Operator Execution

Command Usage

To get an overview over all tones that are configured in SmartWare, use this command.

Example

The following example shows the configured value for a specific, configured call-progress-tone named ‘defaultBusytone’:

```
SN#show profile call-progress-tone defaultBusytone

Call progress tone defaultBusytone
-----------------------------------------------
tone id:              2
high frequency        0 Hz
low frequency         425 Hz
high frequency level: mute dBm
low frequency level:  -7 dBm
1. on duration:       500 ms
1. off duration:      500 ms
2. on duration:       0 ms
2. off duration:      0 ms
```

The next example outputs a list of all configured call-progress tones and their parameters (with the same output per tone as above):

```
SN#show profile call-progress-tone
```

Related Commands

Command	Description
profile call-progress-tone	Enter call-progress tone configuration

show profile tone-set

show profile tone-set [<*name*> **]**

Function

Display information about tone sets

Syntax Description

Option	**Description**
<*name*>	The name of the profile

Default

None

Mode

Operator Execution

Command Usage

SmartWare knows different tone-sets. These sets define mappings between an event that triggers a tone, and how the tone looks like (see the configuration guide).

Example

The following example displays the tone-set named ‘default’:

```
SN#show profile tone-set default

Tone set default
-------------------------------------------------
DTMF high frequency level: -4 dBm
DTMF low frequency level:  -4 dBm
DTMF duration:             80 ms
DTMF interspace:           80 ms
-------------------------------------------------
Call progress Tone mapping:
  dialtone -> defaultDialtone
  alertingtone -> defaultAlertingtone
  busytone -> defaultBusytone
```

The left-handed expression (e.g. ‘dialtone’) is the tone triggering event, the right-handed expression (e.g. ‘defaultDialtone’) is the call-progress-tone that is played back upon this event.

The next example displays all configured tone-sets consecutively. The output is the same as above, but per tone-set.

```
SN#show profile tone-set
```

Related Commands

Command	Description
profile tone-set	Enter tone set profile configuration
use tone-set-profile	Link a tone-set profile to the selected interface

show profile voip

show profile voip [*<name>* **]**

Function

Display information about VoIP profiles

Syntax Description

Option	**Description**
<name>	Name of the profile

Default

None

Mode

Operator Execution

Command Usage

Use this command to get information about all VoIP profiles in the current configuration.

Example

The following example shows a specific VoIP profile named 'default':

```
SN>show profile voip default
```

The next example shows a list of all defined VoIP profiles.

```
SN>show profile voip
```

Related Commands

Command	**Description**
profile voip	Enter the VoIP profile
use voip-profile	Link ISoIP gateway to a VoIP profile

show rip

show rip [interface <*ip_interface_name_show*> **[router]]**

Function

Displays RIP information

Syntax Description

Option	**Description**
interface	Displays RIP configuration of the selected IP interface
<*ip_interface_name_show*>	Name of the IP interface
router	IP context of the interface

Default

None

Mode

Operator Execution

Command Usage

Called without options, the global rip information is displayed. If at least one interface has rip enabled, the **show rip** command displays rip enabled.
To display all the rip options of a specified interface the command must be called with the interface option, and optionally the context of the interface (not necessary if only one context exists).

Example

The following example shows the global rip status:

```
SN>show rip
RIP information
rip enabled
```

The next example shows the rip options of a specified interface:

```
SN>show rip interface eth0
Interface eth0 (IP context router):
--------------------------------------------------
                   listen: enabled
                   supply: enabled
             send version: 1compatible
          receive version: 1or2
               learn host: disabled
            learn default: disabled
            announce host: enabled
          announce static: disabled
         announce default: disabled
 announce self-as-default: disabled
           route-holddown: disabled
```

```
            poison-reverse: disabled
              auto-summary: disabled
             split-horizon: enabled
       default-route-value: 0
  --------------------------------------------------
```

Related Commands

Command	**Description**
rip announce	Enable RIP announcing
rip announce host	Enable RIP announce IP host routes
rip announce static	Enable RIP announce static IP routes
rip auto-summary	Enable RIP auto summarization
rip default-route-value	Set the RIP default route metric
rip learn default	Enable RIP learning using default route advertised by a RIP neighbor
rip learn host	Enable accepting of received IP host routes
rip listen	Enable receive RIP on an interface
rip poison-reverse	Enable the poison reverse algorithm
rip receive version	Select the receive RIP version on an interface
rip route-holddown	Enable holding down aged routes on an interface
rip send version	Select the send RIP version on an interface
rip split-horizon	Enable RIP split-horizon processing on an interface
rip supply	Enable send RIP on an interface

show service-policy

show service-policy [interface <*interface-name*> **[router]]**

Function

Display the status of running link arbitration

Syntax Description

Option	Description
interface	Selected IP interface
<*interface-name*>	IP interface name
router	IP context of the interface

Default

None

Mode

Operator Execution

Command Usage

The **show profile service-policy** command displays link scheduling profile information of an existing service-policy profile.

Example

The following example shows how to display link scheduling profile information of a user defined service-policy profile named *VoIP_Layer2_CoS*.

```
SN>show profile service-policy VoIP_Layer2_CoS
VoIP_Layer2_CoS
  default (mark layer 2 cos -1)
```

Related Commands

None

show uptime

show uptime

Function

Show system uptime since last restart

Syntax Description

Option	Description
This command has no keywords or options	

Default

None

Mode

Operator Execution

Command Usage

Show system uptime since last restart.

Example

```
SN>show uptime
SN>The system is up for 30 days, 8 hours, 14 minutes, 37 seconds
```

Related Commands

None

show version

show version

Function

Displays version information

Syntax Description

Option	Description
This command has no keywords or options	

Default

None

Mode

Operator Execution

Command Usage

To display different informations about the system hardware, the software version, the PLD versions, the interface cards use the show version command.

Example

The following is sample output from the show version command on a SmartNode 1200:

```
SN>show version

Productname      : SN1X00
Software Version : SmartWare R2.00 BUILD21137
Supplier         : Inalp Networks Inc.
Provider         : Pink Telecom Solutions
Subscriber       : MegaSoft Inc.

Information for Slot 0:
SN1X00 (Admin State: Application Started, Real State: Application
Started)
Hardware Version : 4, 1
Serial number    : 100000020138
Software Version : SmartWare R2.00 BUILD21137
```

The following is sample output from the show version command on a SmartNode Sn2300 with an IC-4BRV VoIP interface card:

```
SN>show version

Productname      : SN2300
Software Version : SmartWare R2.00 BUILD22051
Supplier         : Inalp Networks Inc.
Provider         : Pink Telecom Solutions
```

```
Subscriber       : MegaSoft Inc.

Information for Slot 0:
SN2300 (Admin State: Application Started, Real State: Application
Started)
Hardware Version : 2, 1
Serial number    : 100000023116
PLD Version      : 0x23020204
Software Version : SmartWare R2.00 BUILD22051

Information for Slot 1:
this Slot is empty

Information for Slot 2:
IC-4BRV (Admin State: Application Started, Real State: Application
Started)
Hardware Version : 2, 1
Serial number    : 100000022688
Manufactor number: 0105305437
Production date  : 0003-02
PLD Version      : 0x00170002
Software Version : Build 24052, min required : Build 24050
Loader Version   : Build 39, min required: Build 39

Information for Slot 3:
this Slot is empty
```

Related Commands

None

show version cli

show version cli

Function

Displays CLI version

Syntax Description

Option	Description
This command has no keywords or options	

Default

None

Mode

Operator Execution

Command Usage

This command shows the version of the command interpreter.

Example

```
SN(cfg)>show version cli
CLI version : 2.00
```

Related Commands

Command	Description
cli version	Selects CLI version

su

su <*account*>

Function

Changes login identity

Syntax Description

Option	**Description**
<*account*>	Name of the account to which the current session shall be changed.

Default

None

Mode

Operator Execution

Command Usage

This command can be used to change the login identity of the current session. If an operator logs in and later wishes to configure the system, she may change her identity to an adminsitrator instead of logging off and logging in again as administrator.

Example

The following example shows an operator logging in and changing its identity to an administrator:

```
login:test
password:
SN(cfg)>su administrator
Enter password:
SN(cfg)>
```

Related Commands

Command	**Description**
logout	Terminates session
show accounts	Displays administrator and operator accounts

who

who

Function

Shows users currently logged in

Syntax Description

Option	**Description**
This command has no keywords or options	

Default

None

Mode

Operator Execution

Command Usage

To display who is logged in or to see more detailed information about users and process states the **who** command provides this information.

Note: Depending on execution mode the command displays varying information. In operator execution mode only the user name being used at the moment is reported, which helps checking the identity. In administrator execution mode the command output is more detailed and shows information about all users currently logged in, user name, state, idle time and location.

Example

The first example shows the output of the **who** command, when entered as operator.

```
SN>who
You are operator rene
```

The second example shows the output of the **who** command when entered by an administrator. In this case the command displays all users that are currently logged in. The asterisk denotes the current user (that is you). State represents the actual running condition of the user, which can be logout, login, exec and config.

```
SN#who
     ID  User name             State    Idle      Location
   *  0  administrator         exec     00:00:00  172.31.14.100:3952
      1  rene                  config   00:00:39  172.31.14.192:3330
```

Related Commands

None

3 ADMINISTRATOR EXECUTION MODE

3.1 Command Overview

This chapter describes in detail all the commands available to you as a system administrator. In addition to all operator commands, additional commands are available to the administrator that enable complete configuration and control of the system. The commands that are available to you in this mode are listed in Table 3-1 below:

Command	Description
copy	Copies configurations and software images
debug acl	Enables or disables access-list debug monitor
debug all	Enables or disables all debug monitors
debug dsp	Enables or disables DSP debug monitor
debug gateway h323	Enables or disables H.323 gateway debug monitor
debug gateway isoip	Enables or disables ISoIP gateway debug monitor
debug isdn	Enables or disables ISDN debug monitor
debug session-control	Enables or disables session-control debug monitor
debug session-router	Enables or disables session-router debug monitor
debug sntp client	Enables or disables SNTP client debug monitor
debug voip-data	Enables or disables voip debug monitor
enable	Enters administration execution mode
end	Exit the current configuration mode
erase	Erases persistent configurations
reload	Restarts the system
session-control close	Close open sessions
show	Displays system information
show accounts	Displays administrator and operator accounts
show context cs	Displays circuit context information
show crc	Displays checksum of a configuration
show gateway h323	Displays H.323 gateway information
show gateway isoip	Displays isoip information
show isdn	Displays ISDN information
show log supervisor	Displays system state before last restart
show profile acl	Displays access-list profile information
show profile napt	Displays NAPT profile information
show profile service-policy	Displays link scheduling profile information
show service-policy	Displays link scheduler information
show session-control	Displays session-control information
show snmp	Displays system information related to SNMP
show sntp-client	Displays information and status of SNTP client

Table 3-1: Commands available in Administrator Execution Mode

copy

copy <*source*> <*destination*>

Function

Copies configurations and software images

Syntax Description

Option	Description
<*source*>	URL of the source file that is to be copied.
<*destination*>	URL of the destination of the copy operation.

Default

None

Mode

Administrator Execution

Command Usage

When referring to a configuration file on the local system, the URL takes the following form:

nvram:*configfilename*

When referring to the current running configuration, the URL takes the following form:

system:running-config

When referring to a TFTP server, the URL takes the following form, where A.B.C.D is the IP address of the TFTP server:

tftp://*A.B.C.D*[*/directory*]*/filename*

When referring to the image of the system for batch file download, the destination URL takes the following form:

flash:

Note: The system provides a number of shortcuts for the URLs that are used most often. These shortcuts are shown in the following table.

Shortcut	URL
running-config	system:running-config
factory-config	nvram:factory-config
startup-config	nvram:startup-config

Example

The following example copies a configuration file from a TFTP server to the startup configuration of the system. (Configuration Download). This configuration is then executed during the next system startup.

```
SN#copy tftp://172.16.36.80/configs/mystartup startup-config
```

The next example copies the startup configuration of the system to a TFTP server (Configuration Upload):

```
SN#copy startup-config tftp://172.16.36.80/configs/mystartup
```

The next example saves the current configuration of the system to a configuration file on the non-volatile disk.

```
SN#copy running-config nvram:temp-config
```

The next example copies a non-volatile configuration file to the startup configuration. This configuration is then executed during the next system startup:

```
SN#copy nvram:temp-config startup-config
```

The next example saves the current configuration of the system to the startup configuration. This configuration is then executed during the next system startup.

```
SN#copy running-config startup-config
```

The next example downloads a new software image from the TFTP server to the system. The specified batchfile b contains a number of new download jobs that are exeucted by the download agent on the system.

```
SN#copy tftp://172.16.36.80/images/image1/b flash:
```

Related Commands

Command	Description
erase	Erases a persisten configuration file
show	Displays configuration files

debug acl

[**no**] **debug acl** [{ **in**|**out** } [<*detail*>]]

Function

Enables or disables access-list debug monitor

Syntax Description

Option	**Description**
acl	Enables or disables access-list debug monitor
in	Specifies that the settings for incoming packets are to be changed
out	Specifies that the settings for outgoing packets are to be changed
<*detail*>	The detail level. Level 0 disables all debug output, level 7 shows all debug output. The default value is 0, which disables debug output.

Default

The default <*detail*> value is 0, which disables debug output.

Mode

Administrator Execution

Command Usage

In the form **[no] debug acl** this command Enables or disables the debug monitor for the access-list system. The command can be called in the Administrator Execution mode and all modes below.
In the form **[no] debug acl** { **in** | **out** } [level] the command changes the debug level for a specific interface. The command needs to be called in the IP Interface Configuration Mode.
To debug an access-list attached to an IP interface you must enable the access-list monitor globally (**debug acl**) and for the desired interface (i.e. **debug acl in 7** in the corresponding interface mode).
Use the **no** form of this command to disable debug output.

Warning: Debug output is limited to 4 messages per access-list and second to prevent system degradation. It is not possible to debug the connection your Telnet application is running over. The debug output sent to your telnet client, will itself trigger new debug output, thus producing a never-ending loop.

Example

Enable debugging for incoming traffic on interface *eth0*. Note that you must be in the configuration interface mode of interface *eth0* to enter this command.

```
SN(cfg-if)[eth0]#debug acl in 7
SN(cfg-if)[eth0]#debug acl
SN(cfg-if)[eth0]#
```

Disable the debug monitor globally.

```
SN(cfg-if)[eth0]#no debug acl
SN(cfg-if)[eth0]#
```

Related Commands

None

debug all

[no] debug all

Function

Enables or disables all debug monitors

Syntax Description

Option	Description
This command has no keywords or options	

Default

None

Mode

Administrator Execution

Command Usage

This command enables all debug monitors. The no form disables all monitors.
We highly recommend to only use this command in the no form, since switching on all monitors produce an enormous amount of logs.

Example

The following example switches off all debug monitors:

```
SN#no debug all
```

Related Commands

None

debug dsp

[no] debug dsp [*<detail>* **]**

Function

Enables or disables DSP debug monitor

Syntax Description

Option	Description
dsp	Enables or disables DSP debug monitor
<detail>	Detail level

Default

None

Mode

Administrator Execution

Command Usage

The debug DSP command prints channel information when activating or deactivating. DSP error information (e.g. underruns, overruns and misalignements) are indicated. When voice problems occur, this command may be useful for verifying the DSPs

Warning: When signalling a lot, the output may be too large, so that information may be lost.

Example

The following examples show how the DSP monitor is switched on:

```
SN#debug dsp
```

The next examples show how the DSP monitor is switched off:

```
SN#no debug dsp
```

Related Commands

Command	Description
debug voip-data	Enables or disables VoIP debug monitor

debug gateway h323

[no] debug gateway h323 [*<name>* **] [all signaling ras h245 ca caerr channels cm cmapi cmapicb cmerr debug efrm li liinfo namechan pdlapi pdlchan pdlcomm pdlconf pdlencode pdlerror pdlfnerr pdlprint pdlprnerr pdlprnwrn pdlsm pdlsrc pdlmisc pdlmtask pdllist pdltimer per pererr q931 ra rasctrl rasindb seli timer tpktchan tunnctrl udpchan unreg vt] [** *<detail>* **]**

Function

Enables or disables H.323 gateway debug monitor

Syntax Description

Option	Description
<name>	Name of the H.323 gateway
all	All H.323 application monitors
signaling	H.323 call signaling monitor
ras	H.323 RAS monitor
h245	H.245 monitor
ca	Low level monitor, use only if told by technical support
caerr	Low level monitor, use only if told by technical support
channels	Low level monitor, use only if told by technical support
cm	Low level monitor, use only if told by technical support
cmapi	Low level monitor, use only if told by technical support
cmapicb	Low level monitor, use only if told by technical support
cmerr	Low level monitor, use only if told by technical support
debug	Low level monitor, use only if told by technical support
efrm	Low level monitor, use only if told by technical support
li	Low level monitor, use only if told by technical support
liinfo	Low level monitor, use only if told by technical support
namechan	Low level monitor, use only if told by technical support
pdlapi	Low level monitor, use only if told by technical support
pdlchan	Low level monitor, use only if told by technical support
pdlcomm	Low level monitor, use only if told by technical support
pdlconf	Low level monitor, use only if told by technical support
pdlencode	Low level monitor, use only if told by technical support
pdlerror	Low level monitor, use only if told by technical support
pdlfnerr	Low level monitor, use only if told by technical support
pdlprint	Low level monitor, use only if told by technical support
pdlprnerr	Low level monitor, use only if told by technical support
pdlprnwrn	Low level monitor, use only if told by technical support
pdlsm	Low level monitor, use only if told by technical support
pdlsrc	Low level monitor, use only if told by technical support

pdlmisc	Low level monitor, use only if told by technical support
pdlmtask	Low level monitor, use only if told by technical support
pdllist	Low level monitor, use only if told by technical support
pdltimer	Low level monitor, use only if told by technical support
per	Low level monitor, use only if told by technical support
pererr	Low level monitor, use only if told by technical support
q931	Low level monitor, use only if told by technical support
ra	Low level monitor, use only if told by technical support
rasctrl	Low level monitor, use only if told by technical support
rasindb	
seli	
timer	
tpktchan	
tunnctrl	
udpchan	
unreg	
vt	
<detail>	Detail level

Default

The value for option name is set to h323 by default

Mode

Administrator Execution

Command Usage

The command is used to enable H.323 gateway specific monitors

Warning: Enabling these monitors may severely impact system performance. Reboot the system after using these monitors to make sure, all monitors are turned off.

Example

The following example shows how to enable the main H.323 call signalling monitor

```
SN#debug gateway h323 signaling
```

Related Commands

Command	Description
debug session-control	Enables the session-control monitor to display the messages passed between session-control and the H.323 gateway.

debug gateway isoip

[no] debug gateway isoip [isoip] [*<detail>* **]**

Function

Enables or disables ISoIP gateway debug monitor

Syntax Description

Option	Description
isoip	Name of the ISoIP gateway
<detail>	Detail level is a value in the range from 0 to 5

Default

If not explicitly specified the detail level is set to 0 by default.

Mode

Administrator Execution

Command Usage

Enables the ISoIP debug monitor to get information about running ISoIP connections.

Note: This command does not generate any output but enables the debugging feature for ISoIP.

Example

The following example shows the usage of the **debug gateway isoip** command to enable the debugging feature for ISoIP with a detail level of 5:

```
SN#debug gateway isoip 5
```

Related Commands

None

debug isdn

[no] debug isdn *<slot>* *<port>* **{ all | layer1 | layer2 | layer3 }**

Function

Enables or disables ISDN debug monitor

Syntax Description

Option	Description
<slot>	ISDN slot
<port>	ISDN port
all	Enables or disables debug monitor of all ISDN layers on the given port
layer1	Enables or disables debug monitor of ISDN layers 1
layer2	Enables or disables debug monitor of ISDN layers 2
layer3	Enables or disables debug monitor of ISDN layers 3

Default

None

Mode

Administrator Execution

Command Usage

The **debug isdn** command enables or disables ISDN debug monitor. In general, call control information according to ITU-T Q.931 Specification is exchanged between end stations via ISDN layer 3. Accordingly, the control information over layer 3 is very valuable for fault finding. ISDN defines three layers:

Layer 1	Physical Layer specified by I.430 for a basic rate interface (BRI) and by I.431 for a primary rate interface (PRI)
Layer 2	Data Link Layer specified by Q.921 (D-channel LAPD)
Layer 3	Network Layer specified by Q.931 (Call Control)

Note: The **debug isdn** command enables debugging for an explicit ISDN interface of a SmartNode. Therefore each interface can be debugged using the appropriate debug monitors, or information about the layer of interest.

Example

The following example enables debugging for an ISDN interface on slot 0 and port 0 for layer 3 control information.

```
SN#debug isdn 0 0 layer3
```

Related Commands

None

debug session-control

[no] debug session-control [<*name*> **] [** <*detail*> **]**

Function

Enables or disables session-control debug monitor

Syntax Description

Option	**Description**
<*name*>	Name of the CS context
<*detail*>	Detail level

Default

The value of option <*name*> is set to switch and the value for <*detail*> is set to 0 by default.

Mode

Administrator Execution

Command Usage

This command is used to enable the session-control monitor, which mainly displays all Q.931 messages, which pass through the system.

Warning: Enabling this monitor may impact system performance under heavy load.

Example

The following example shows how to enable the session-control monitor:

```
SN#debug session-control
```

Related Commands

Command	**Description**
debug isdn	Enables the ISDN stack monitor
debug session-router	Enables the session-router monitor
debug gateway h323	Enables the H.323 gateway monitor
debug gateway isoip	Enables the IsoIP gateway monitor
debug voip-data	Enables voice over the ip data monitor
debug dsp	Enables the DSP monitor

debug session-router

[no] debug session-router [*<name>* **] [** *<detail>* **]**

Function

Enables or disables session-router debug monitor

Syntax Description

Option	Description
<name>	Name of the CS context
<detail>	Detail level

Default

The value of option *<name>* is set to switch by default.

Mode

Administrator Execution

Command Usage

This command is used to enable the session-router monitor for a specific circuit-switching context. This monitor visualizes all session-router lookups for voice call routing. Also this monitor prints error information, while parsing the session-router configuration.

Warning: if neccessary

Example

The following example enables the session-router monitor:

```
SN#debug session-router
```

The next example shows how the session-router monitor is used to identify session-router configuration problems:

```
SN#context cs
SN#debug session-router
SN#no shutdown
```

Related Commands

Command	Description
debug session-control	Enables the session-control monitor
context cs	Enters session-router configuration mode

debug sntp client

[no] debug sntp client

Function

Enables or disables SNTP client debug monitor

Syntax Description

Option	Description
sntp	Enables or disables SNTP debug monitor
client	Enables or disables SNTP client debug monitor

Default

None

Mode

Administrator Execution

Command Usage

The **debug sntp client** command prints a short overview of each incoming and outcoming SNTP packet. This command may be useful to show which SNTP server is connected or if there anwers from a server at all.

Example

The following examples shows how to turn on and off the debug mode:

```
SN#debug sntp client
SN#no debug sntp client
```

Related Commands

Command	Description
sntp-client	Enable or disable SNTP client
show sntp-client	Show SNTP client configurations

debug voip-data

[no] debug voip-data [*<detail>* **]**

Function

Enables or disables voip debug monitor

Syntax Description

Option	Description
<detail>	Detail level

Default

None

Mode

Administrator Execution

Command Usage

The debug voip-data command prints voice path information. The connection / disconnection of the voice path, RTP, Dejitter and Packet collector configuration is traced with each channel activation. During an open channel, Dejitter errors (e.g. Overruns, packet loss) are indicated. Also tone information (signalling and DTMF tones) is traced with the voip-data monitor. When voice or tone problems occur, this command may be useful to find the problem.

Warning: When signalling a lot, the output may be too large, so that information may be lost. Also packet loss produces a lot of voip-data output.

Example

The following example shows how the voip-data monitor is switched on and off:

```
SN#debug voip-data
SN#no debug voip-data
```

Related Commands

Command	Description
debug dsp	Enables or disables DSP debug monitor

enable

enable

Function

Enters administration execution mode

Syntax Description

Option	Description
This command has no keywords or options	

Default

None

Mode

Administrator Execution

Command Usage

Changes the command mode from operator (nonpriviledged) execution to the administrator (priviledged) execution mode. Only administrators can execute this command. Operators are not allowed to enter administrator execution mode.

Example

The following example, an administrator enters the enable command during a CLI session. The session enters administrator execution mode as indicated by the # sign in the prompt.

```
SN>enable
SN#
```

Related Commands

Command	Description
exit	Exits the current mode
end	Returns to the administrator execution mode

end

end

Function

Exit the current configuration mode and return to and immediately returns to administrator execution mode

Syntax Description

Option	Description
This command has no keywords or options	

Default

None

Mode

Administrator Execution

Command Usage

Use this command to exit the current configuration mode and immediately returns to administrator execution mode.

Example

The following example shows an administrator using the **end** command to immediately return from IP context configuration to the administrator execution mode:

```
SN(ctx-ip)[router]#end
SN#
```

Related Commands

None

erase

erase <*config*>

Function

Erases persistent configurations

Syntax Description

Option	**Description**
<*config*>	Name of a persistent configuration.

Default

None

Mode

Administrator Execution

Command Usage

This command erases a persisten configuration. The factory configuration cannot be erased. The startup configuration can be specified as `nvram:startup-config` or by the shortcut `startup-config`.

Example

The following example erases the startup configuration file. During the next system startup, the factory-configuration is executed:

```
SN#erase startup-config
```

The next example copies a backup configuration to the startup configuration and then erases the backup configuration:

```
SN#copy nvram:backup-config startup-config
SN#erase nvram:backup-config
```

Related Commands

None

reload

reload

Function

Restarts the system

Syntax Description

Option	Description
This command has no keywords or options	

Default

None

Mode

Administrator Execution

Command Usage

Use this command to restart the system. For safety reasons you must confirm the operation. You will also be prompted if the running-configuration has been changed. In this case it is possible to store the current running configuration.

Warning: Restarting the system will close all open voice and data connections.

Example

The following example shows how the **reload** command request confirmation before restarting the system.

```
SN#reload
Running configuration has been changed.
Do you want to copy the 'running-config' to the 'startup-config'?
Press 'yes' to store, 'no' to drop changes : no
Press 'yes' to restart, 'no' to cancel : yes
The system is going down
```

Related Commands

None

session-control close

session-control close <*session*>

Function

Close open sessions

Syntax Description

Option	**Description**
close	Close open sessions
<*session*>	Session ID or 'all' for all

Default

None

Mode

Administrator Execution

Command Usage

This command is used to immediately close a specific or all active voice calls.

Warning: This command allows you to immediately terminate any ongoing voice call. Therefore be very careful, when using it in productive environments.

Example

The following example closes the call with session-id 3:

```
SN#session-control close 3
```

The next example closes all active voice calls:

```
SN#session-control close all
```

Related Commands

None

show

show {nvram:|<*config*>**}**

Function

Displays system information

Syntax Description

Option	Description
nvram:	List of all persistent configuration files
<*config*>	Configuration file of which the content is to be displayed or **running-config** to display the current configuration.

Default

None

Mode

Administrator Execution

Command Usage

Show nvram: displays a list of all persistent configuration files in the non-volatile disk of the system. **Show** <*config*> displays the content of one of the persistent configuration. **Show running-config** displays the current configuration of the system.

Example

The following examples displays a list of all persistent configuration file:

```
SN#show nvram:
Persistent configurations:
factory-config
startup-config
```

The next example displays the context of the startup configuration:

```
SN#show nvram:startup-config
  cli version 2.00
  sntp-client
  sntp-client server primary 172.16.1.10 port 123 version 4
  sntp-client poll-interval 600
  sntp-client gmt-offset + 01:00:00
  system hostname NOD_032_010

system
  clock-source 2 0
  ...
```

The next example displays the current system configuration:

```
SN#show running-config
  cli version 2.00
  sntp-client
  sntp-client server primary 172.16.1.10 port 123 version 4
  sntp-client poll-interval 600
  sntp-client gmt-offset + 01:00:00
  system hostname NOD_032_010

system
  clock-source 2 0
  …
```

Related Commands

Command	Description
copy	Copy configuration files

show accounts

show accounts

Function

Displays administrator and operator accounts

Syntax Description

Option	Description
This command has no keywords or options	

Default

None

Mode

Administrator Execution

Command Usage

This command displays a list of all administrator and operator accounts.

Example

The following example shows the output of the command:

```
SN#show accounts
administrator accounts:
  admin
operator accounts:
  op
```

Related Commands

Command	Description
administrator	Configures administrator accounts
operator	Configures operator accounts
su	Switches the user identity

show context cs

show context cs [<*name*> **] {config | orphans | monkeys } [** <*detail*> **]**

Function

Displays circuit context information

Syntax Description

Option	**Description**
context	Displays context information
cs	Displays circuit context information
<*name*>	Name of the CS context
config	Displays available session-router configurations
orphans	Displays unused objects
monkeys	Displays referenced, but inexistant objects
<*detail*>	Detail level

Default

The value of option <*name*> is set to switch by default.

Mode

Administrator Execution

Command Usage

Displays the current configuration of a circuit-switching context.

Example

The following example shows the usage of the show context cs command to display available session router configurations with a detail level of 1:

```
SN#show context cs config 1
Following session-router configuration sets are available:
  switch
    Interfaces:
      access
```

Related Commands

None

show crc

show crc { running-config | factory-config | startup-config | system:running-config | cli: | preferences: | <*config*> **}**

Function

Displays checksum of a configuration

Syntax Description

Option	Description
crc	Displays checksum of a configuration
running-config	Current running configuration
factory-config	Factory configuration
startup-config	Startup configuration
system:running-config	Current running configuration
cli:	CLI XML specification
preferences:	Preferences file
<*config*>	Persistent configuration

Default

None

Mode

Administrator Execution

Command Usage

You can use this command to check whether a configuration has been changed. First calculate the checksum for the original version and write it down somewhere. To check whether the configuration has changed, just calculate the checksum again and compare it with the original one. If the new checksum differs from the original one, the configuration has changed.
The checksum is displayed as hexadecimal number.

Example

The following example computes the checksum of the startup configuration.

```
SN#show crc startup-config
Startup configuration:
checksum: 0x93078981
```

Related Commands

Command	Description
show	Displays system information

show gateway h323

show gateway h323 [<*name*> **] { config | status | stack-config }**

Function

Displays H.323 gateway information

Syntax Description

Option	Description
<*name*>	Name of the H.323 gateway
config	Displays h323-gateway configuration
status	Displays h323-gateway status

Default

The value of option <*name*> is set to h323 by default.

Mode

Administrator Execution

Command Usage

Displays configuration or status information about the H.323 gateway.

Example

The following example displays the H.323 gateway configuration:

```
SN#show gateway h323 config
```

The next example displays the H.323 gateway status:

```
SN#show gateway h323 status
```

Related Commands

None

show gateway isoip

show gateway isoip [*<name>* **] { sessions | connections } [** *<detail>* **]**

Function

Displays isoip information

Syntax Description

Option	Description
gateway	Displays gateway information
isoip	Displays isoip information
<*name*>	Name of the ISoIP gateway
sessions	Displays information about current ISoIP sessions
connections	Displays information about current ISoIP connections
<*detail*>	Detail level

Default

The value of option <*name*> is set to isoip by default.

Mode

Administrator Execution

Command Usage

Displays status information about the ISoIP gateway.

Example

The following example displays all currently active ISoIP sessions:

```
SN#show gateway isoip sessions
```

The next example displays all currently active ISoIP connections to remote gateways:

```
SN#show gateway isoip connections
```

Related Commands

None

show isdn

show isdn { sessions | layer3-status | bearer-channels } [*<detail>* **]**

Function

Displays ISDN information

Syntax Description

Option	Description
isdn	Displays ISDN information
sessions	Displays information about ISDN sessions
layer3-status	Displays ISDN layer 3 status information
bearer-channels	Displays bearer-channel status
<detail>	Detail level

Default

None

Mode

Administrator Execution

Command Usage

Used to display information about the ISDN gateway.

Example

The following example displays all currently active ISDN sessions:

```
SN#show isdn sessions
```

The next example displays current bearer-channel usage:

```
SN#show isdn bearer-channels
```

Related Commands

None

show log supervisor

show log supervisor

Function

Displays system state before last restart

Syntax Description

Option	**Description**
This command has no keywords or options	

Default

None

Mode

Administrator Execution

Command Usage

This command displays the system state before the last reboot. Depending on the cause of the reboot the information will differ.
The size of the supervisor logfile is limited. New entries will replace old entries. The latest entry is displayed last.
In general the output of this command will be interpreted by 2nd level customer support.

Example

The following example shows the beginning of a supervisor logfile.

```
SN#show log supervisor
2001-01-01T10:46:42 - #SYSLOG FILE - START - SmartWare R2.00 BUILD22024
2001-01-01T10:56:53 - SystemSupervisor : svCliEventLoop reported XCode
0x1d608
2001-01-01T10:56:53 - SystemSupervisor : State change to 1 (Task dead lock)
Task Information:
=================
  NAME       TID     PRI  ERRNO     STATUS    OBJ_TYPE  OBJ_ID  CNT/OWNR DELAY
---------- -------- --- -------- ---------- -------- -------- -------- -----
tExcTask    177f568   0        0 PEND                                       0
tLogTask    177cbe0   0        0 PEND                                       0
tWdbTask    177b578   3        0 PEND                                       0
tSysSV      15a2f08  48        0 READY                                      0
tHwWDog     17fbbe0  48        0 PEND+T     SEM_B    17fbe10               14
tKern_e     1764a48  80        0 READY                                      0
tKern_c     175e688  80   3d0004 READY                                      0
tLedServer  1751918  80        0 DELAY                                     33
tonmas      17fe178 144   3d0004 READY                                      0
tUser_c     1756b98 176   3d0004 READY                                      0
tSig_e      173f568 176        0 PEND       SEM_B    1745978                0
tUser_e     175cf58 176        0 PEND       SEM_B    175d628                0
tCLI_e      16265d0 176        0 DELAY                                    188
tSntp_e     1609ac8 176        0 PEND       SEM_B    160a4a0                0
tSig_t      15cacd0 176        0 PEND       SEM_B    15caf00                0
```

```
     tFileXfer   155daa0 176        0 PEND       SEM_B     16162e0               0
     tDownLd     1559888 176        0 PEND       SEM_B     1616138               0
     tSig_c      172f350 176        0 PEND       SEM_B     1745938               0
     tEcmProd    15a3898 208        0 PEND       SEM_B     155e680               0
```

Related Commands

Command	Description
show log	Displays system log

show profile acl

show profile acl [<*acl_name*>]

Function

Displays access-list profile information

Syntax Description

Option	Description
profile	Displays profile information
acl	Displays acl profile information
<*acl_name*>	Name of acl profile to show

Default

If <*name*> is omitted all installed access-list profiles are shown.

Mode

Administrator Execution

Command Usage

Displays the indicated access-list profile. If <*name*> is omitted all installed access-list profiles are shown. If an access-list is linked to an IP interface, the number of matches for each rule is displayed. If the access-list profile is linked to more than one IP interface, it will be shown once for each interface.

Example

The following example shows the content of the access-list profile WanIn:

```
SN#show profile acl WanIn
ip access-list WanIn. Linked to router/eth0/in.
    permit tcp any host 193.14.2.10 eq 80 (13349 matches)
    permit ip host 62.1.2.3 host 193.14.2.11 (876 matches)
    deny ip any any (1438432 matches)
```

Related Commands

Command	Description
profile acl	Creates an IP access-list profile and enters configuration mode
use profile acl	Binds an access-list profile to an IP interface

show profile napt

show profile napt [<*name*> **]**

Function

Displays NAPT profile information

Syntax Description

Option	**Description**
<*name*>	NAPT profile name to display.

Default

None

Mode

Administrator Execution

Command Usage

Displays the configuration of a NAPT profile and whether or not the profile is used by an IP interface. If the profile name is not specified, the command displays a list of all NAPT profiles.

Example

The following example displays a list of all NAPT profiles:

```
SN#show profile napt
NAPT profiles:
--------------
  test
```

The next example displays the “test” NAPT profile:

```
SN#show profile napt test
NAPT profile test:
------------------
  ICMP default server: (none)

  Protocol        Port  Destination Host
  --------------- ----- ----------------
  tcp                23 10.0.0.1
```

Related Commands

Command	**Description**
profile napt	Configures NAPT profiles
use profile napt	Binds a NAPT profile to an IP interface

show profile service-policy

show profile service-policy [*<arbiter-name>* **]**

Function

Displays link scheduling profile information

Syntax Description

Option	**Description**
<arbiter-name>	Name of the profile. Report information about the specified profile.

Default

None

Mode

Administrator Execution

Command Usage

This command displays a configuration summary for a link scheduler. If no arbiter-name is specified, all profiles are listed. Hierarchcal profiles are reported with an inset.

Example

The following example shows the command output for the sample configuration described in the profile service policy chapter:

```
SN#show profile service-policy
sample (rate-limit 512, header-length 18)
  local-voice (priority)
  default (min 20 %)
  web (min 20 %, queue 40 pkts)
  mail (min 10 %)
  local-default (min 10 %)
  vpn_limiter (min 40 %)
    link_1 (max 128 kbps)
    link_2 (max 64 kbps)
```

Related Commands

Command	**Description**
profile service-policy	Defines a link scheduler
use profile service-policy	Installs a link scheduler

show service-policy

show service-policy [*<interface-name>* **]**

Function

Displays link scheduler information

Syntax Description

Option	Description
<interface-name>	Report information about the specified interface only.

Default

None

Mode

Administrator Execution

Command Usage

This command displays the queue status for the active (used) link schedulers. The amount of information depends on the “debug queue statistics” settings.

Example

The following example shows the command output with debug queue statistics set to level five. In this example most of the packets did not to wait at all. There was enough bandwidth available for them tobe “passed” on immediately. The queue was never full and therefore no packet had tobe discarded. The delay figures shown are for the packets that had to be queued only, but 99% of the packets did not have to wait at all.

```
SN#show service-policy
  web
   - packets in queue: 0
   - peak queue level: 5
   - packets passed: 4584
   - bytes passed: 280303
   - packets queued: 45
   - bytes queued: 12206
   - packets discarded: 0
   - bytes discarded: 0
   - average delay: 14.93 ms
   - max delay: 27.89 ms
```

Related Commands

Command	Description
profile service-policy	Defines a link scheduler
debug queue statistics	Specifies if the queues collect statistics information

show session-control

show session-control [<*name*> **] { subsystems | sessions } [** <*detail*> **]**

Function

Displays session-control information

Syntax Description

Option	**Description**
session-control	Displays session-control information
<*name*>	Name of the CS context
subsystems	Displays information about registered subsystems
sessions	Displays information about session-control sessions
<*detail*>	Detail level

Default

The value of option <*name*> is set to switch by default.

Mode

Administrator Execution

Command Usage

Displays information about all subsystems currently registered at the session-control and about currently active voice sessions.

Example

The following example displays all currently active voice sessions:

```
SN#show session-control sessions
```

The next example shows all registered subsystems:

```
SN#show session-control subsystems
```

Related Commands

None

show snmp

show snmp

Function

Displays system information related to the configuration or use of the Simple Network Management Protocol (SNMP).

Syntax Description

Option	Description
This command has no keywords or options	

Default

None

Mode

Administrator Execution

Command Usage

This command is used to display system information related to the configuration or use of the Simple Network Management Protocol (SNMP).

Example

The following example shows the usage of this command:

```
SN#show snmp

SNMP Information:
  hostname : SN
  location : Building 2, 3rd Floor, Room-C
  contact  : Hotline 1-800-800-800

 Hosts:
   172.16.36.74 security-name public

 Targets:
   172.16.36.74 security-name public

 Communities:
   public access-right rw
```

Related Commands

Command	Description
snmp community	Defines an SNMP community and its access rights

snmp host	Defines the access of a host to the MIB objects.
snmp target	Defines an SNMP notification (trap) receiver

show sntp-client

show sntp-client

Function

Displays information and status of SNTP client

Syntax Description

Option	Description
sntp-client	Displays information and status of SNTP client

Default

None

Mode

Administrator Execution

Command Usage

Displays all sntp client configurations of the running config. To show which sntp server is connected to an enabled sntp-client, the **debug sntp client** command is helpful.

Example

The following example shows the usage of this command:

```
SN#show sntp-client
--------------------------------------------
SNTP client        enabled
Operating mode     unicast
Local port         123
Primary server     172.16.1.10:123 v4
Secondary server   10.0.0.3:123 v4
Anycast address    224.0.1.1:123
Poll interval      60sec
Local clock offset disabled
GMT offset         +02:00:00
--------------------------------------------
```

Related Commands

Command	Description
sntp-client	Enable or disable the sntp client
debug sntp client	Enable or disable sntp debug monitor

4 CONFIGURE MODE

4.1 Command Overview

The configuration mode allows you to configure the system. It is entered from the admininstrator execution mode, and so you must have administrator privileges to enter this mode and use its commands.

In addition to the commands that are available in the two previously described modi, you have the commands as listen in Table 4-1 below at your disposal:

Command	Description
administrator	Specify administrator's password
banner	Change login banner
cli version	Define desired CLI version
clock set	Set the system clock
configure	Enter configuration mode
operator	Specify the operator's password
snmp community	Set the SNMP community access string
snmp host security-name	Define the access of a host to the MIB objects
snmp target security-name	Define an SNMP notification (trap) receiver
sntp-client	Start/stop/configure SNTP client
sntp-client anycast-address	SNTP client anycast address
sntp-client gmt-offset	Specify SNTP client constant offset to GMT
sntp-client local-clock-offset	Switch on compensation for local clock offset
sntp-client local-port	Specify SNTP local UDP port
sntp-client operating-mode	Specify SNTP client operating mode
sntp-client poll-interval	Specify SNTP client poll interval
sntp-client server	Set a primary and secondary SNTP time server
system contact	Set the contact for this system
system hostname	Modify the system hostname
system location	Set the system location string
system provider	Set the provider for the system
system subscriber	Set the subscriber for the system
system supplier	Set the supplier for the system
webserver	Configures/starts the webserver

Table 4-1: Commands available in Configure Mode

administrator

[no] administrator <*account*> **password** <*password*>

Function

Specifies the administrator's password

Syntax Description

Option	Description
<*account*>	An alphanumeric string indicating the administrator username.
password <*password*>	An alphanumeric string indicating the administrator password.

Default

A default administrator account with username “administrator” and no password exists as long as no administrator is created.

Mode

Configure

Command Usage

This command creates a new administrator account or changes an existing account’s password. The no form removes the administrator account.

Administrators are able to enter administrator execution and configuration modes.

You can enter a password with embedded spaces or an empty password by enclosing the entire password in double quotation marks (for example, “my password” or “” when the administrator needs no password to log in).

If there exists no configured administrator account, the system provides a default account for logging in with username “administrator” and no password. As soon as an administrator account is created using this command the default account disappears. It reappears when the last administrator account has been deleted.

Warning: When the system generates a configuration file this command appears with the clear password.

Example

The following example creates a new administrator account for the administrator “root” with password “abc123”:

```
SN(cfg)#administrator root password abc123
```

The next example changes the password of the administrator “root” to empty. Thus the “root” administrator must not enter a password during login:

```
SN(cfg)#administrator root password “”
```

The next example removes the account of the administrator “root”.

```
SN(cfg)#no administrator root
```

Related Commands

Command	Description
operator	Configures operator accounts
show accounts	Displays administrator and operator accounts

banner

[no] banner *<banner>*

Function

Change login banner

Syntax Description

Option	**Description**
<banner>	Banner that is displayed before logging in

Default

No banner is defined

Mode

Configure

Command Usage

Specifies the message to be displayed when an administrator or operator opens a new CLI session, e.g. by connecting to the system using Telnet. The no form of this command deletes the banner.

The text can contain spaces when it is encapsulated in double quotes ("This is a banner with spaces."). When using quotes, the text may contain newlines typing \n (backslash and n), backslashes typing \\ (two backslashes) or double quotes typing \" (backslash and double quote).

Example

The following example lets the name of the company appear on a new CLI session before the user is requested to enter username and password:

```
SN(cfg)#banner “Inalp Networks\n\“Welcome\“\n"
```

The next example removes the configure banner:

```
SN(cfg)#no banner
```

Related Commands

None

cli version

cli version *<version>*

Function

Defines desired CLI version

Syntax Description

Option	Description
version	Defines desired CLI version
<version>	CLI version in the form version.revision (i.e. 2.00)

Default

None

Mode

Configure

Command Usage

Define CLI version. This command must only be used at the beginning of a configuration file. It describes for which CLI version the script was written.
The command can not be entered in interactive mode.
This command is required to provide backward compatibility for existing configuration scripts. By specifying the **cli version** command, it is possible to execute old configuration scripts in newer versions of the CLI. If you omit the **cli version** command, the old scripts might fail in future versions of the CLI.

Example

```
SN(cfg)#show running-config
Running configuration:
#----------------------------------------------------------------#
#                                                                #
# Sn2300                                                         #
# SmartWare R2.00 BUILD22024                                     #
# 2001-01-01T13:38:50                                            #
# Generated configuration file                                   #
#                                                                #
#----------------------------------------------------------------#

  cli version 2.00
  operator rene password rene
  banner "Inalp Networks\nMeriedweg 7\nCH-3172 Niederwangen\n\nTel:
+4131-985-2525\nE-Mail: info@inalp.com\n\n"
  system hostname SN
  ...
```

Related Commands

Command	Description
show cli version	Show CLI version

clock set

clock set <*time*>

Function

Sets the system clock

Syntax Description

Option	**Description**
<*time*>	Date and time to set of the form yyyy-mm-ddThh:mm:ss

Default

None

Mode

Configure

Command Usage

Use this command to set the date and time of the system. You must always specify date and time of the form yyyy-mm-ddThh:mm:ss, where yyyy is the year in four digits, mm the month in two digits and dd the day of the month in two digits, hh is the hour in two digits, mm the minute in two digits and ss the second in two digits. You always have to specify the full number of digits.

Warning: Don’t enter this command when the SNTP client is enables. The SNTP client periodically sets date and time and overwrites a time configured using this command.

Example

The following examples sets the clock to Thursday, May the 2nd 2002 at 12:00:00:

```
SN(cfg)#clock set 2002-05-02T12:00:00
```

Related Commands

Command	**Description**
show clock	Displays the current system date and time

configure

configure

Function

Enters configuration mode

Syntax Description

Option	Description
This command has no keywords or options	

Default

None

Mode

Configure

Command Usage

Enters configuration mode. After you enter the configure command, the system prompt changes from **nodename#** to **nodename(config)#**, indicating that you are in configuration mode. To avoid consistency problems, only one session may be in configuration mode or a configuration sub mode. If another CLI session already is in configuration mode, the invocation of this command expects a confirmation. To leave configuration mode and return to the administrator execution mode, use the **end** command.

Example

The following examples changes from administrator execution mode to configuration mode:

```
SN#configure
SN(cfg)#
```

The next example shows that you must confirm entering the configuration mode if another session already configures the system:

```
SN#configure
Another session already configures the system.
Multiple configuration sessions may cause conflicts.
Press 'yes' to enter configuration mode, 'no' to cancel : yes
SN(cfg)#
```

Related Commands

Command	Description
end	Exits configuration mode and returns to administrator execution mode

operator

[no] operator <*account*> **password** <*password*>

Function

Specifies operator's password

Syntax Description

Option	Description
<*account*>	An alphanumeric string indicating the operator username.
password <*password*>	An alphanumeric string indicating the operator password.

Default

None

Mode

Configure

Command Usage

This command creates a new operator account or changes an existing operator's password. The no form removes the operator account.

Operators are not able to enter administrator execution or configuration modes.

You can enter a password with embedded spaces or an empty password by enclosing the entire password in double quotation marks (for example, "my password" or "" when the operator needs no password to log in).

Warning: When the system generates a configuration file this command appears with the clear password.

Example

The following example create a new operator account for the operator john with password "123456":

```
SN(cfg)#operator john password 123456
```

The next example changes the password of the operator "john" to empty. Thus John must not enter a password during login:

```
SN(cfg)#operator john password ""
```

The next example removes the account for the operator "john":

```
SN(cfg)#no operator john
```

Related Commands

Command	Description
administrator	Configures administrator accounts
show accounts	Displays administrator and operator accounts

snmp community

[no] snmp community <*community*> **{ ro|rw }**

Function

Sets the community access string used to permit access to the SNMP protocol and MIB objects on the system

Syntax Description

Option	Description
<*community*>	SNMP community string
ro	Access-right read-only
rw	Access-right read-write

Default

Community *public* with read-only access to the MIB objects.

Mode

Configure

Command Usage

Use the no form to remove a community string.

Example

The following command defines the community *public* to have read-only access to the MIB objects.

```
SN(cfg)#snmp community public ro
```

Related Commands

Command	Description
snmp host	Defines the access of a host to the MIB objects.
snmp target	Defines an SNMP notification (trap) receiver
show snmp	Display information about SNMP

snmp host security-name

[no] snmp host <*ip-address*> **security-name** <*community*>

Function

Defines the access of a host to the MIB objects

Syntax Description

Option	Description
<*ip-address*>	IP address of the host
security-name	The community of the host
<*community*>	Community string

Default

All hosts have access to the MIB objects of the system as defined by the security-name *public* .

Mode

Configure

Command Usage

The community given as security-name must be configured before using this command.

Use the no form to remove a host from a community.

Example

The following commands define a community `private` with read-write access and apply the security rights of that community to the host with the IP address 172.16.1.11. The host with the IP address 172.16.1.11 therefore has access to the MIB objects of the system as defined in the community `private`.

```
SN(cfg)#snmp community private rw
SN(cfg)#snmp host 172.16.1.11 security-name private
```

Related Commands

Command	Description
snmp community	Defines an SNMP community and its access rights
snmp target	Defines an SNMP notification (trap) receiver
show snmp	Displays information about SNMP

snmp target security-name

[no] snmp target <*ip-address*> **security-name** <*community*>

Function

Defines an SNMP notification (trap) receiver

Syntax Description

Option	Description
target	Configure a target that will receive SNMP traps
<*ip-address*>	IP address of the target
security-name	The community of the target
<*community*>	Community string

Default

None

Mode

Configure

Command Usage

The community given as security-name must be configured before using this command.

Use the no form to remove a notification receiver.

Example

The following command adds the target with the IP address 172.16.1.11 to the receivers of SNMP notifications (traps).

```
SN(cfg)#snmp target 172.16.1.11 security-name public
```

Related Commands

Command	Description
snmp community	Defines an SNMP community and its access rights
snmp host	Defines the access of a host to the MIB objects.
show snmp	Displays information about SNMP

sntp-client

[no] sntp-client

Function

Start, stop or configure SNTP client

Syntax Description

Option	Description
This command has no keywords or options	

Default

None

Mode

Configure

Command Usage

This command is used to enable (disable by invertion) the sntp client. After the execution of the non-inverted command, the sntp client sends immediately a sntp request (except in multicast mode), even the sntp client was already running. This is used to send a request, without waiting for the specified poll interval.

Example

The following examples shows the usage of this command:

```
SN(cfg)#sntp-client
SN(cfg)#no sntp-client
```

Related Commands

Command	Description
show sntp client	Displays sntp client configuration

sntp-client anycast-address

sntp-client anycast-address <*ip_anycast-address*> **[port** <*sntp_port*> **]**

Function

SNTP client anycast address

Syntax Description

Option	**Description**
anycast-address	SNTP client anycast address
<*ip_anycast-address*>	SNTP client anycast address
port	Set the server port
<*sntp_port*>	SNTP server port number

Default

None

Mode

Configure

Command Usage

The anycast address must be a valid multicast address. The RFC specifies the address `224.0.1.1` as the default multicast address.

Example

The following example shows how to configure the default anycast address:

```
SN(cfg)#sntp-client anycast-address 224.0.1.1 port 123
```

Related Commands

None

sntp-client gmt-offset

sntp-client gmt-offset { + | - } <*time_gmtoffset*>

Function

Specify SNTP client constant offset to GMT

Syntax Description

Option	Description
+	positive time offset from GMT
-	negative time offset from GMT
<*time_gmtoffset*>	time offset in format hh:mm:ss from GMT

Default

None

Mode

Configure

Command Usage

This command is used to adjust the received time to the local timezone.

Example

The following example shows how to set the GMT offset to +2 hours:

```
SN(cfg)#sntp-client gmt-offset + 02:00:00
```

Related Commands

Command	Description
sntp-client local-clock-offset	Switch on compensation for local clock offset

sntp-client local-clock-offset

[no] sntp-client local-clock-offset

Function

Switch on compensation for local clock offset

Syntax Description

Option	Description
local-clock-offset	Switch on compensation for local clock offset

Default

None

Mode

Configure

Command Usage

If enabled the local-clock-offset is added to the received timestamp. The local-clock-offset is calculated as the average of packet-transmission differences.

Example

The following example shows how to use this command:

```
SN(cfg)#sntp-client local-clock-offset
SN(cfg)#no sntp-client local-clock-offset
```

Related Commands

Command	Description
sntp-client gmt-offset { + | - } <*time_gmtoffset*>	Specify SNTP client constant offset to GMT

sntp-client local-port

sntp-client local-port <*sntp_port*>

Function

Specify SNTP local UDP port

Syntax Description

Option	Description
local-port	Specify SNTP local UDP port
<*sntp_port*>	SNTP local UDP port number

Default

None

Mode

Configure

Command Usage

To force the source port of a SNTP message, a port value in the range from 1 to 65535 can be entered. The value 0 means that the router will choose any free port.

Example

The following example sets the sntp clients source address to 123 (default SNTP port):

```
SN(cfg)#sntp-client local-port 123
```

Related Commands

None

sntp-client operating-mode

sntp-client operating-mode { unicast | multicast | anycast }

Function

Specify SNTP client operating mode

Syntax Description

Option	Description
unicast	SNTP client unicast operation
multicast	SNTP client multicast operation
anycast	SNTP client anycast operation

Default

None

Mode

Configure

Command Usage

A SNTP client can operate in multicast mode, unicast mode or anycast mode:

- In unicast mode (point to point), the client sends a request to a designated server at its unicast address and expects a reply from which it can determine the time and, optionally, the roundtrip delay and local clock offset relative to the server.
- In anycast mode (multipoint to point), the client sends a request to a designated local broadcast or multicast group address and expects a reply from one or more anycast servers.
- In multicast mode (point to multipoint), the client sends no request and waits for a broadcast from a designated multicast server.

Example

The following example configures the SNTP client operating mode to unicast operation

```
SN(cfg)#sntp-client operating-mode unicast
```

The next example configures the SNTP client operating mode to anycast operation

```
SN(cfg)#sntp-client operating-mode anycast
```

The last example configures the SNTP client operating mode to multicast operation

```
SN(cfg)#sntp-client operating-mode multicast
```

Related Commands

None

sntp-client poll-interval

sntp-client poll-interval <*number_pollinterval*>

Function

Specify SNTP client poll interval

Syntax Description

Option	**Description**
poll-interval	Specify SNTP client poll interval
<*number_pollinterval*>	SNTP client poll interval

Default

The default value for option <*number_pollinterval*> is 60 seconds.

Mode

Configure

Command Usage

Specifies the seconds between each SNTP client request in unicast or anycast mode.
This SNTP client poll interval can be defined to be within in the range from 1 to 4′294′967′295.

Example

In the following example the SNTP client poll interval is set to 30 seconds.

```
SN(cfg)#sntp-client poll-interval 30
```

Related Commands

None

sntp-client server

sntp-client server { primary | secondary } *<server_address>* **[port** *<sntp_port>* **] [version** *<version_number>* **]**

Function

Set a primary and secondary SNTP time server.

Syntax Description

Option	Description
primary	Primary time server
secondary	Secondary time server
<server_address>	SNTP server IP address
port	Set the server port
<sntp_port>	SNTP server port number
version	Specify the SNTP protocol version
<version_number>	Version number of SNTP protocol

Default

None

Mode

Configure

Command Usage

This command is used to set a primary and secondary SNTP time server. It is recommended to set both the primary and secondary server, that in case of unavailablility of a SNTP time server a backup time server can be used.

Example

In the following example an internal SNTP time server (172.16.1.10) is selected as primary and utcnist.colorado.edu (128.138.140.44) as secondary SNTP time server.

```
SN(cfg)#sntp-client server primary 172.16.1.10
SN(cfg)#sntp-client server secondary 128.138.140.44
```

Related Commands

None

system contact

system contact <*string*>

Function

Set the contact information for this SmartNode

Syntax Description

Option	Description
contact	Set the contact for this system
<*string*>	Text that describes the contact for this system

Default

The system contact is empty.

Mode

Configure

Command Usage

This command is used to configure the information available via the sysContact MIB-II object. Use system contact “” to configure an empty system contact.

Example

The following example shows how to set the system contact information:

```
    SN(cfg)#system contact “Hotline 1-800-800-800”
```

Related Commands

Command	Description
show snmp	Displays information about SNMP
system hostname	Modifies the host name of the device
system location	Sets the system location string

system hostname

system hostname <*string*>

Function

Modifies the system hostname

Syntax Description

Option	Description
hostname	Set the system hostname
<*string*>	String representing the system hostname

Default

The system hostname is empty.

Mode

Configure

Command Usage

This command is used to configure the host name of the device. Use system hostname “” to configure an empty name.

Example

The following example shows how to set the system hostname to *SmartNode*:

```
SN(cfg)#system hostname SmartNode
SmartNode(cfg)#
```

Related Commands

Command	Description
show snmp	Displays information about SNMP
system contact	Sets the contact string for this system
system location	Sets the system location string

system location

system location <*string*>

Function

Sets the system location string

Syntax Description

Option	Description
location	Describe system location
<*string*>	Text that describes the system location

Default

None

Mode

Configure

Command Usage

The command **system location** is used to configure the information available via the sysLocation MIB-II object. Use system location “” to configure an empty location string.

Example

The following example shows how to set the system location information:

```
    SN(cfg)#system location “Building 2, Floor 3, Room C”
```

Related Commands

Command	Description
show snmp	Displays information about SNMP
system contact	Sets the contact string for this system
system hostname	Modifies the host name of the device

system provider

system provider <*string*>

Function

Set the provider for the system

Syntax Description

Option	Description
provider	Set the provider for the system
<*string*>	Text that describes the provider for this system

Default

None

Mode

Configure

Command Usage

To set the system provider for later access via SNMP use the command system provider. The provider name is the following SNMP object:

```
.iso.org.dod.internet.private.enterprises.inalp.temporary.smartnode.sysinfo.provider
```

For an extensive explanation on how to use SNMP on a SmartNode, refer to Chapter 28, "SNMP Configuration", in the Software Configuration Guide for SmartWare, Release 2.00.

Warning: The maximum string length is 255 character.

Example

The following examples set the system provider to Pink Telecom Solutions:

```
SN(cfg)#system provider “Pink Telecom Solutions”
```

The next example deletes the system provider:

```
SN(cfg)#system provider “”
```

Related Commands

Command	Description
system location	Sets the system location string
show version	Display version information

system subscriber

system subscriber <*string*>

Function

Set the subscriber for the system

Syntax Description

Option	**Description**
subscriber	Set the subscriber for the system
<*string*>	Text that describes the subscriber for this system

Default

None

Mode

Configure

Command Usage

To set the system subscriber for later access via SNMP use the command system subscriber. The subscriber name is the following SNMP object:

```
.iso.org.dod.internet.private.enterprises.inalp.temporary.smartnode.sysinfo.subscriber
```

For an extensive explanation on how to use SNMP on a SmartNode, refer to Chapter 28, "SNMP Configuration", in the Software Configuration Guide for SmartWare, Release 2.00.

Warning: The maximum string length is 255 character.

Example

The following examples set the system subscriber to MegaSoft Inc. :

```
SN(cfg)#system subscriber “MegaSoft Inc.”
```

The next example deletes the system subscriber:

```
SN(cfg)#system subscriber “”
```

Related Commands

Command	**Description**
system provider	Set the provider for the system
system contact	Set the contact for this system
show version	Display version information

system supplier

system supplier <*string*>

Function

Set the supplier for the system

Syntax Description

Option	Description
supplier	Set the supplier for the system
<*string*>	Text that describes the supplier for this system

Default

None

Mode

Configure

Command Usage

To set the system suppliere for later access via SNMP use the command system supplier. The supplier name is the following SNMP object:

```
.iso.org.dod.internet.private.enterprises.inalp.temporary.smartnode.sysinfo.supplier
```

For an extensive explanation on how to use SNMP on a SmartNode, refer to Chapter 28, "SNMP Configuration", in the Software Configuration Guide for SmartWare, Release 2.00.

Warning: The maximum string length is 255 character.

Example

The following examples set the system supplierer to Inalp Netwroks Inc. :

```
SN(cfg)#system supplier “Inalp Netwroks Inc.”
```

The next example deletes the system supplier:

```
SN(cfg)#system supplier “”
```

Related Commands

Command	Description
system hostname	Modifies the system hostname
system subscriber	Set the subscriber for the system
show version	Display version information

webserver

[no] webserver [port *<port>* **] [lang { en | de }]**

Function

Starts the webserver or configures the webserver language and the listening port.

Syntax Description

Option	Description
port	Sets the listening port
<port>	Listening port number
lang	Sets the language
en	English
de	Deutsch

Default

None

Mode

Configure

Command Usage

SmartNode includes an embedded web server, which can be used together with a customer-specific Java applet that must be downloaded into the persistent memory region of your SmartNode. Applets are similar to applications but they do not run as standalones. Instead, applets adhere to a set of conventions that lets them run within a Java-compatible browser. With a Java applet, custom-specific configuration tasks of SmartWare are possible using a browser instead of accessing the SmartWare CLI via Telnet or the serial console.

Warning: Without a Java applet the value of the embedded web server is limited. Contact Inalp Networks for any questions about custom designed Java configuration tools for SmartWare.

Example

The following example shows how to set the webserver language and the listening port of your device, if you start from the configuration mode.

```
SN(cfg)#webserver lang en
SN(cfg)#webserver port 80
```

Related Commands

None

5 SYSTEM MODE

5.1 Command Overview

This chapter describes the commands that are available in system mode. The system mode is used to set some basic system settings.

The commands that are available in this mode are listed in Table 5-1 below:

Command	**Description**
bypass-mode	Enable or disable ISDN bypass mode
clock-source	Select clock-source for ISDN circuits
local-inband-tones	Force localy generated inband-tones
synchronize-to-isdn-time	Set the system clock to the received ISDN time
system	Enter system configuration mode

Table 5-1: Commands available in System Mode

bypass-mode

[no] bypass-mode

Function

Enable or disable ISDN bypass mode

Syntax Description

Option	Description
This command has no keywords or options	

Default

No bypass-mode

Mode

System

Command Usage

If the system supports an ISDN bypass between two or more ISDN ports in case of power loss, this command enables the bypass manually.

Warning: If calls are active on the ports, which are bypassed, when issuing this command, the calls will be dropped.

Example

The following example enables the bypass:

```
SN(sys)#bypass-mode
```

The next example disables the bypass:

```
SN(sys)#no bypass-mode
```

Related Commands

None

clock-source

clock-source { internal | (*<slot> <port>* **) }**

Function

Select clock-source for ISDN circuits

Syntax Description

Option	**Description**
internal	Use internal clock reference
<slot>	ISDN slot number
<port>	ISDN port number

Default

None

Mode

System

Command Usage

The command defines the clock-source to be used for all internal PSTN/ISDN circuits. This clock is also used as the reference for all ISDN ports, which play a layer 1 master role and therefore provide a reference clock to the remote side.

Warning: If this command is not configured properly, the bit-error-rate on the ISDN links will be very high.

Example

The following example shows how to use the interal clock-generator as clock-source:

```
SN(sys)#clock-source internal
```

The next example shows how to use the clock recovered from ISDN port 3 in slot 2 for all ISDN circuits:

```
SN(sys)#clock-source 2 3
```

Related Commands

None

local-inband-tones

[no] local-inband-tones

Function

Force localy generated inband-tones

Syntax Description

Option	Description
This command has no keywords or options	

Default

No local-inband-tones

Mode

System

Command Usage

The command is used to force local-generation of dial-, ringback- and busy-tones in all cases where it is supported. If this option is not enabled, the system will only generate in-band tones in cases where no voice data is received from the remote side. If voice data is received from the remote side, it is expected to already contain the correct in-band tones.

Example

The following example shows how to enable local in-band tone generation:

```
SN(sys)#local-inband-tones
```

The next example shows how to disable local in-band tone generation:

```
SN(sys)#no local-inband-tones
```

Related Commands

None

synchronize-to-isdn-time

[no] synchronize-to-isdn-time

Function

Set the system clock to the received ISDN time

Syntax Description

Option	**Description**
This command has no keywords or options	

Default

No synchronize-to-isdn-time

Mode

System

Command Usage

Used to enable adjustment of the internal real-time-clock to the time received in Q.931 signalling messages, which pass through the session-control.

Warning: If Q.931 signalling messages with timestamps from different timezones are processed within the system, the real-time-clock will switch back and forth between these different timezones. Therefore only use this feature, if you are sure, that only one reliable source proviedes time information in the Q.931 signaling.

Example

The following example enables real-time-clock synchronization:

```
SN(sys)#synchronize-to-isdn-time
```

The next example disables real-time-clock synchronization:

```
SN(sys)#no synchronize-to-isdn-time
```

Related Commands

None

system

system

Function

Enter the system configuration mode

Syntax Description

Option	**Description**
This command has no keywords or options	

Default

None

Mode

System

Command Usage

The system mode is used to set some basic system settings.

Example

The following example shows how the **system** command is used to switch to the system mode:

```
SN(cfg)#system
SN(sys)#
```

Related Commands

None

6 IC VOICE MODE

6.1 Command Overview

In this mode you may configure an interface card's voice mode. The commands that are available, in addition to those of the modi already described, are listen in Table 6-1 below:

Command	Description
ic voice	Enter the interface card voice mode
pcm	Configure PCM settings for all DSPs on the slot

Table 6-1: Commands available in IC Voice Mode

ic voice

ic voice <*slot*>

Function

Enter the interface card voice mode.

Syntax Description

Option	**Description**
<*slot*>	The number of the slot (interface card)

Default

None

Mode

IC Voice

Command Usage

The **ic voice** command is used to enter the interface card voice mode. Specific parameters for the selected voice interface card can be set in this mode.

Example

The following example enters the voice interface card configuration mode for interface card 2:

```
SN(sys)#ic voice 2
SN(ic voice)[2]#
```

Related Commands

None

pcm

pcm law-select { aLaw | uLaw }

Function

Configure PCM settings commonly for all DSPs on the interface card.

Syntax Description

Option	Description
law-select	Configure the PCM law of all DSPs on the interface card
aLaw	Set the PCM law to A law for all DSPs on the interface card
uLaw	Set the PCM law to u law for all DSPs on the interface card

Default

Law-select defaults to aLaw.

Mode

IC Voice

Command Usage

The law-select option directly influences the G.711 companding curves the DSPs apply on the PCM side. In Europe, standard is aLaw, in the United States uLaw. Both laws are supported with a rate of 64kBit/s.
The command is executed immediately, and all DSPs on the interface card will reboot. A brief voice drop on all connections on that interface card may occur.

Warning: Change the law paramter only if you know that all devices that are connected to the interface card use the same, known law.

Example

The following example configures the DSPs to use uLaw on interface card slot 2:

```
SN(ic-voice)[2]#pcm law-select uLaw
```

Related Commands

None

7 PROFILE ACL MODE

7.1 Command Overview

In this mode you may configure an access control list (ACL). The commands that are available, in addition to those of the modi already described, are listed in Table 7-1 below:

Command	**Description**
{ permit ǀ deny } ip	Add an IP filter rule to the current access-list profile
{ permit ǀ deny } icmp	Add an ICMP filter rule to the current access-list profile
{ permit ǀ deny } { tcp ǀ udp ǀ sctp }	Create an access list profile
profile acl	Creates an IP ACL profile and enters configuration mode

Table 7-1: Commands available in Profile ACL Mode

{ permit | deny } ip

{ **permit** | **deny** } **ip**
{ *<src>* *<src-wildcard>* | **any** | **host** *<src>* }
{ *<dest>* *<dest-wildcard>* | **any** | **host** *<dest>* }
[**cos** *<group>*]

Function

Add an IP filter rule to the current access-list profile

Syntax Description

Option	Description
<src>	The source address to be included in the rule. An IP address in dotted-decimal-format (e.g. 64.231.1.10).
<src-wildcard>	A wildcard for the source address. Expressed in dotted-decimal format this value specifies which bits are significant for matching. One-bits in the wildcard indicate that the corresponding bits are ignored. An example for a valid wildcard is 0.0.0.255, which specifies a class C network.
any	Indicates that IP traffic to or from all IP addresses is to be included in the rule.
host <*src*>	The address of a single source host.
<dest>	The destination address to be included in the rule. An IP address in dotted-decimal-format (e.g. 64.231.1.10).
<dest-wildcard>	A wildcard for the destination address. See *src-wildcard*.
host <*dest*>	The address of a single destination host.
cos *<group>*	Optional. Specifies that packets matched by this rule belong to a certain Class of Service (CoS).

Default

None

Mode

Profile ACL

Command Usage

Rules are evaluated in the order as they were entered in the access-list profile. The first match is taken and all further matches are ignored. If you place a *deny ip any any* rule at the top of an access-list profile, no packets will pass regardless of the other rules you defined.

Example

Create a new access-list profile named *WAN_Input* and enter some rules.

```
SN(cfg)#profile acl WAN_Input
SN(pf-acl)[WAN_Inp~]#permit ip host 62.1.2.3 host 193.14.2.11 cos
Urgent
SN(pf-acl)[WAN_Inp~]#permit ip 62.1.2.3  0.0.255.255 host 193.14.2.11
SN(pf-acl)[WAN_Inp~]#permit ip 97.123.111.0 0.0.0.255 host 193.14.2.11
SN(pf-acl)[WAN_Inp~]#deny ip any any
SN(pf-acl)[WAN_Inp~]#exit
```

Related Commands

Command	**Description**
profile acl	Creates an IP access-list profile
use profile acl	Binds an access-list profile to an IP interface
show profile acl	Displays access-list profile information
{ **permit** ǀ **deny** } { **icmp** }	Adds a rule to an access-list
{ **permit** ǀ **deny** } { **tcp** ǀ **udp** ǀ **sctp** }	Adds a rule to an access-list

{ permit | deny } icmp

{ **permit** | **deny** } **icmp**
{ <*src*> <*src-wildcard*> | **any** | **host** <*src*> }
{ <*dest*> <*dest-wildcard*> | **any** | **host** <*dest*> }
[**msg** <*name*> | **type** <*type*> | **type** <*type*> **code** <*code*>]
[**cos** <*group*>]

Function

Add an ICMP filter rule to the current access-list profile.

Syntax Description

Option	**Description**
<*src*>	The source address to be included in the rule. An IP address in dotted-decimal-format (e.g. 64.231.1.10).
<*src-wildcard*>	A wildcard for the source address. Expressed in dotted-decimal format this value specifies which bits are significant for matching. One-bits in the wildcard indicate that the corresponding bits are ignored. An example for a valid wildcard is 0.0.0.255, which specifies a class C network.
any	Indicates that IP traffic to or from all IP addresses is to be included in the rule.
host <*src***>**	The address of a single source host.
<*dest*>	The destination address to be included in the rule. An IP address in dotted-decimal-format (e.g. 64.231.1.10).
<*dest-wildcard*>	A wildcard for the destination address. See *src-wildcard*.
host <*dest***>**	The address of a single destination host.
msg <*name***>**	The ICMP message name. The following are valid message names: administratively-prohibited, alternate-address, conversion-error, dod-host-prohibited, dod-net-prohibited, echo, echo-reply, general-parameter-problem, host-isolated, host-precedence-unreachable, host-redirect, host-tos-redirect, host-tos-unreachable, host-unknown, host-unreachable, information-reply, information-request,

	mask-reply, mask-request, mobile-redirect, net-redirect, net-tos-redirect, net-tos-unreachable, net-unreachable, network-unknown, no-room-for-option, option-missing, packet-too-big, parameter-problem, port-unreachable, precedence-unreachable, protocol-unreachable, reassembly-timeout, redirect, router-advertisement, router-solicitation, source-quench, source-route-failed, time-exceeded, timestamp-reply, timestamp-request, traceroute, ttl-exceeded, unreachable
type <*type*>	The ICMP message type. A number from 0 to 255 (inclusive)
code <*code*>	The ICMP message code. A number from 0 to 255 (inclusive)
cos <*group*>	Optional. Specifies that packets matched by this rule belong to a certain Class of Service (CoS).

Default

None

Mode

Profile ACL

Command Usage

Rules are evaluated in the order as they were entered in the access-list profile. The first match is taken and all further matches are ignored. If you place a *deny ip any any* rule at the top of an access-list profile, no packets will pass regardless of the other rules you defined.

Example

Create a new access-list profile named *WAN_Input* to filter all ICMP echo requests (as used by the ping command). Echo request is defined as ICMP message type 8, code 0. After applying the following access-list to the WAN port (incoming traffic) of your SmartNode it will no longer respond to the ping command.

```
SN(cfg)#profile acl WAN_Input
SN(pf-acl)[WAN_Inp~]#deny icmp any any type 8 code 0
SN(pf-acl)[WAN_Inp~]#permit ip any any
SN(pf-acl)[WAN_Inp~]#exit
```

The same effect can also be obtained by using the simpler and more readable **msg** <*name*> option. See the following example.

```
SN(cfg)#profile acl WAN_Input
SN(pf-acl)[WAN_Inp~]#deny icmp any any msg echo
SN(pf-acl)[WAN_Inp~]#permit ip any any
SN(pf-acl)[WAN_Inp~]#exit
```

Related Commands

Command	**Description**
profile acl	Creates an IP access-list profile
use profile acl	Binds an access-list profile to an IP interface
show profile acl	Displays access-list profile information
{ **permit** | **deny** } { **ip** }	Adds a rule to an access-list
{ **permit** | **deny** } { **tcp** | **udp** | **sctp** }	Adds a rule to an access-list

{ permit | deny } { tcp | udp | sctp }

{ **permit** | **deny** } { **tcp** | **udp** | **sctp** }
{ *<src>* *<src-wildcard>* | **any** | **host** *<src>* }
[**eq** *<port>* | **gt** *<port>* | **lt** *<port>* | **range** *<from>* *<to>*]
{ *<dest>* *<dest-wildcard>* | **any** | **host** *<dest>* }
[**eq** *<port>* | **gt** *<port>* | **lt** *<port>* | **range** *<from>* *<to>*]
[**cos** *<group>* | **cos-rtp** *<group-data>* *<group-ctrl>*]

Function

Create an access list profile

Syntax Description

Option	**Description**
<src>	The source address to be included in the rule. An IP address in dotted-decimal-format (e.g. 64.231.1.10).
<src-wildcard>	A wildcard for the source address. Expressed in dotted-decimal format this value specifies which bits are significant for matching. One-bits in the wildcard indicate that the corresponding bits are ignored. An example for a valid wildcard is 0.0.0.255, which specifies a class C network.
any	Indicates that IP traffic to or from all IP addresses is to be included in the rule.
host <*src***>**	The address of a single source host.
eq <*port***>**	Optional. Indicates that a packets port must be equal to the specified port in order to match the rule.
lt <*port***>**	Optional. Indicates that a packets port must be less than the specified port in order to match the rule.
gt <*port***>**	Optional. Indicates that a packets port must be greater than the specified port in order to match the rule.
range <*from*> *<to>*	Optional. Indicates that a packets port must be equal or greater than the specified *from* port and less than the specified *to* port to match the rule.
<dest>	The destination address to be included in the rule. An IP address in dotted-decimal-format (e.g. 64.231.1.10).
<dest-wildcard>	A wildcard for the destination address. See *src-wildcard*.
host <*dest***>**	The address of a single destination host.
cos *<group>*	Optional. Specifies that packets matched by this rule belong to a certain Class of Service (CoS).
cos-rtp *<group-data>* *<group-ctrl>*	Optional. Specifies that the rule is intented to filter RTP/RTCP packets. In this mode you can specify different CoS groups for data packets (even port numbers) and control packets (odd port numbers).

Note: This option is only valid when protocol UDP is selected.

Default

None

Mode

Profile ACL

Command Usage

Rules are evaluated in the order as they were entered in the access-list profile. The first match is taken and all further matches are ignored. If you place a *deny ip any any* rule at the top of an access-list profile, no packets will pass regardless of the other rules you defined.

Example

Create a new access-list profile named *Wan_In* and enter some rules.

```
SN(cfg)#acl profile Wan_In
SN(pf-acl)[WAN_In]#permit tcp any host 193.14.2.10 eq 80
SN(pf-acl)[WAN_In]#permit udp host 62.1.2.3 host 193.14.2.11 range
1024 2048
SN(pf-acl)[WAN_In]#deny ip any any
SN(pf-acl)[WAN_In]#exit
```

Create a RTP/RTCP rule: In this example all incoming packets addressed to ports in the range from 4096 to 4122 will be assigned to the CoS group *RtpData* for all data ports (even port numbers) and *RtpControl* for all control ports (odd port numbers).

```
SN(cfg)#acl profile Wan_In
172.19.72.3(pf-acl)[Wan_In]#permit udp any any range 4096 4122 cos-rtp
RtpData RtpControl
SN(pf-acl)[WAN_In]#deny ip any any
SN(pf-acl)[WAN_In]#exit
```

Related Commands

Command	Description
profile acl	Creates an IP access-list profile
use profile acl	Binds an access-list profile to an IP interface
show profile acl	Displays access-list profile information
{ **permit** | **deny** } { **ip** }	Adds a rule to an access-list
{ **permit** | **deny** } { **icmp** }	Adds a rule to an access-list

profile acl

[**no**] **profile acl** <*name*>

Function

Creates an IP access-list profile and enters configuration mode

Syntax Description

Option	Description
acl	Accesslist profile
<*name*>	The name of the access-list profile.

Default

None

Mode

Profile ACL

Command Usage

Use the **profile acl** command to create an access-list profile and to enter the configuration mode where you can define rules using the **permit** and **deny** commands.
Use the **no** form of this command to delete an access-list profile. You can not delete an access-list profile if it is currently linked to an interface.
When you leave the access-list mode with the **exit** command, the new settings immediately become active.
Each access-list automatically ends in a **deny ip any any** rule, even if you don't explictly add this rule. This has the effect, that all packets that do not match any of the rules are automatically dropped. Nevertheless it is good practice to always end an access-list with a **deny ip any any** rule, to clarify the behaviour.

Example

Create a new access-list profile named *WanRx* and enter some rules.

```
SN(cfg)#profile acl WanRx
SN(pf-acl)[WanRx]#permit tcp any host 193.14.2.10 eq 80
SN(pf-acl)[WanRx]#permit ip host 62.1.2.3 host 193.14.2.11
SN(pf-acl)[WanRx]#deny ip any any
SN(pf-acl)[WanRx]#exit
```

Related Commands

Command	Description
permit	Adds a rule to an access-list
deny	Adds a rule to an access-list
use profile acl	Binds an access-list profile to an IP interface

show profile acl	Displays access-list profile information

8 PROFILE SERVICE-POLICY MODE

8.1 Command Overview

This chapter describes the commands used to configure the SmartWare quality of service (QoS) features. QoS in networking refers to the capability of the network to provide a better service to selected network traffic. The commands that are available, in addition to those of the modi already described, are listend in Table 8-1 below:

Command	Description
mode	Set arbitration scheme of selected service policy profile
profile service-policy	Enter link arbiter configuration mode
rate-limit	Limit interface rate

Table 8-1: Commands available in Profile Service-Policy Mode

8.2 Cross Reference to Source Mode Chapter

The following commands listed in Table 8-2 are described in the source mode chapter. When used in profile service-policy mode they define default values for the profile, which can be overriden in individual source modes.

Command	Description
debug queue statistics	Enable statistics for the link scheduler queues
queue-limit	define maximum queue length for this traffic source
set ip dscp	select DiffServ marking
set ip precedence	select precedence marking
set ip tos	define tos value
set layer2 cos	select Class-Of-Service marking

Table 8-2: Related Commands available Source Mode

mode

mode { shaper | wfq }

Function

Set arbitration scheme of selected service policy profile

Syntax Description

Option	Description
shaper	use shaping
wfq	use weighted fair queueing (default)

Default

The weighted fair queueing (wfq) arbitration scheme is used by default.

Mode

Profile Service-Policy

Command Usage

Use this command to select the type of link arbitration to be used. If your application requires some sources to be scheduled according to one policy and others according to another policy – you must combine multiple service-policy profiles to hierarchical scheduler (See the “source” commad for an example).

Mode	Description
wfq (weighted fair queueing)	*Minium*: assures a minimal bandwith share for each source. When not all sources are currently active, the other sources receive the unused bandwith according to their relative shares. If three sources A,B & C have shares 30%, 10% & 60% and “C” is currently idle – A and B will receive 75% and 25% of the bandwidth respectively. Use the “share” command in “source” mode to define the bandwith share.
shaper	*Maximum*: Aassures that no source uses more than the assigned bandwidth. If not all sources use their quota the link may be partially unused. The shaper may introduce jitter: although the shaper calculates a precise departure time for each packet, two sources sometimes yield the same departure time and one of them will be delayed. The shaper alows the delayed source to catch up with the next packet, but the inter-packet gap will then be shorter than specified. Warning: the shaper allows the sources to catch up even if they lag far behind their schedule because you overallocated the link.

Example

The following example configures a link scheduler for weighted fair queueing:

```
SN(cfg)#profile service-policy sample
SN(pf-srvpl)[sample]#mode wfq
SN(pf-srvpl)[sample]#rate-limit 512
SN(pf-srvpl)[sample]#source class web
SN(src)[web]#share 75
SN(src)[web]exit
SN(pf-srvpl)[sample]#source class default
SN(src)[default]#share 25
```

The next example configures a link scheduler for shaping:

```
SN(cfg)#profile service-policy vpn_limiter
SN(pf-srvpl)[vpn_lim~]#mode shaper
SN(pf-srvpl)[vpn_lim~]#source class link_A
SN(src)[web]#rate 128
SN(src)[web]exit
SN(pf-srvpl)[vpn_lim~]#source class link_B
SN(src)[default]#rate 64
```

Related Commands

None

profile service-policy

[no] profile service-policy <*arbiter-name*>

Function

Enter link arbiter configuration mode

Syntax Description

Option	**Description**
service-policy	Enter link arbiter configuration mode
<*arbiter-name*>	Name of the arbiter

Default

None

Mode

Profile Service-Policy

Command Usage

Use this command to create or edit a service-policy profile. A service-policy profile describes how the link bandwidth is shared accross the sources listed within the profile. The profile may also be configured to assign part of the bandwidth to another service-policy profile, which hierarchically "refines" the bandwidth assignment.

Note: Every service-policy profile that is at the "root" of a hierarchical scheduler (e.g. that is "used" by a port) must have "rate-limit" and a "source class default" specified.

Warning: Clever queueing only makes sense before the bottleneck where queues build up, i.e. at the access link port.

Example

The following example shows the simples use of a service-policy profile: voice traffic is given priority over the rest of the packets (called "default"). The "exit" statements are optional.

```
SN(cfg)#profile service-policy sample
SN(pf-srvpl)[sample]#rate-limit 512
SN(pf-srvpl)[sample]#source class local-voice
SN(src)[local-v~]#priority
SN(src)[web]#exit
SN(pf-srvpl)[sample]#source class default
SN(src)[default]#exit
SN(pf-srvpl)[sample]#exit
```

Related Commands

Command	**Description**

source	Enter source configuration mode
rate-limit	Limit interface rate
mode	Arbitration scheme of this service-policy profile

rate-limit

[no] rate-limit <*value*> **[header-length** <*option-value*> **]**

Function

Limit interface rate

Syntax Description

Option	Description
<*value*>	Rate limit in kilobits
header-length	modem encapsulation overhead key-word
<*option-value*>	framing bytes needed to carry an ip packet (default 18)

Default

Required command, default header-length is 18

Mode

Profile Service-Policy

Command Usage

Use this command to match the link scheduling with the bandwidth of the link – for instance the acess link bandwidth of an external modem. When the framing of the link is different from ethernet (18 bytes) the optional "header-length" parameter configures how many bytes are added to the each IP packet length when the bandwidth usage is calculated. When a link uses PPP with header compression the average frame length may even be shorter than packet contained. Use a negative "header-length" value to specify the average encapsulation gain.

Warning: even for a serial port service-policy profile a rate-limit must be specified because the rate is determined by the external modem.

Example

The following example shows a configuration, which assures that non-voice packets ("default") are queued such that voice plus data traffic is limited to 512 kilobits per second.

```
SN(cfg)#profile service-policy sample
SN(pf-srvpl)[sample]#rate-limit 512
SN(pf-srvpl)[sample]#source class local-voice
SN(src)[local-v~]#priority
SN(src)[web]#exit
SN(pf-srvpl)[sample]#source class default
SN(src)[default]#exit
SN(pf-srvpl)[sample]#exit
```

Related Commands

None

9 SOURCE MODE

9.1 Command Overview

This chapter describes the commands used to configure the SmartWare quality of service (QoS) features. QoS in networking refers to the capability of the network to provide a better service to selected network traffic. The source mode is used to specify source classes that are later used in service-policy profiles. The commands that are available, in addition to those of the modi already described, are listend in Table 9-1 below:

Command	Description
debug queue statistics	Enable statistics for the link scheduler queues
police burst-size	Required argument
priority	Allow source class to bypass the link scheduler
queue-limit	Define maximum queue length for this traffic source
random-detect	Use RED to handle overload situations
rate	Bit-rate specification for shaper (kilobits)
set ip dscp	Select the DiffServ marking
set ip precedence	Select precedence marking
set ip tos	Define the type of service (TOS) value
set layer2 cos	Select the class of service (COS) marking
share	Fair Queueing weight (relative to other sources)
source	Enter source configuration mode

Table 9-1: Commands available in Source Mode

debug queue statistics

[no] debug queue statistics [*<value>* **]**

Function

Enable statistics gathering for the link scheduler queues

Syntax Description

Option	Description
queue	Debug link scheduler operations
statistics	enable statistics gathering
<value>	Level of detail (value in the range from 1 to 4)

Default

No debug queue statistics

Mode

Source

Command Usage

This command determines the amount of statistics gathered by the link scheduler queues. Link scheduler queues exist for each “source” defined in the active service-policy profiles. The information can be inspected using the “show service-policy” command.
Statistics are reset whenever you change settings of the profile.

Level	Information
0 (no)	only momentary queue length available (packets in queue at the time of command execution).
1	adds packet counters: showing packets “passed”, “queued” and “discarded” separately. Packets that were “passed” , did not have to wait at all (bandwidth not yet fully used). Packets that were “queued” arrived earlier that their rate limit permitted and had to wait. Packets that were “discarded” arrived when the queue was already full or were were chosen by the random detect algorithm to be discarded (if RED was enabled) or they violated the traffic policing specified useing the “police” command.
2	adds byte counters for the same three cases as listed above.
3	adds a peak queue length variable showing the maximum number of packets waiting since the last restart or change of the profile settings.
4	adds delay time monitoring: maximum and average delay percieved by the packets that have been queued are traced.

Packets that did not have to wait at all (“passed”) are not included in the average delay figure.

Under some circumstances, i.e. when a source is given priority and no packet markings are requested, no queue exists and therefore no statics will be available.

Note: When used in “source class” mode, this command acts on this specific traffic class only. The command can also be used in “source policy” mode where it acts on all traffic classes served further down the hierarchy or it can be used in “profile service-police” mode where it defines a default for all traffic classes of the profile. Settings further down the hierarchy override previous (default) settings.

Warning: collection of statistics is time-consuming and may affect system performance. You should only enable queue statistics for debugging purposes.

Example

The following examples show the impact of the debug queue settings:

```
SN(src)[web]#debug queue statistics 4
...
SN#show service-policy
  web
   - packets in queue: 0
   - peak queue level: 16
   - packets passed: 1192
   - bytes passed: 61818
   - packets queued: 121
   - bytes queued: 6263
   - packets discarded: 0
   - bytes discarded: 0
   - average delay: 8.89 ms
   - max delay: 20.63 ms


SN(cfg)#no debug queue statistics
...
SN#show service-policy
  web
   - packets in queue: 0
```

Related Commands

Command	**Description**
show service-policy	Displays link arbitration status

police burst-size

[no] police <*average*> **burst-size** <*tolerance*>

Function

required argument

Syntax Description

Option	**Description**
<*average*>	average rate permitted (kbps)
burst-size	required argument
<*tolerance*>	burst size tolerated (kilobits ahead of schedule)

Default

No police selected

Mode

Source

Command Usage

Use this command to protect your network from a traffic class generating excessive load. Policing is used to check if a source conforms to an agreed traffic limit. Packets violating the rate limit are discarded.

The tolerance value determines how much jitter the traffic may have and still conform to the rate limit. If zero tolerance is specified the policing checks the time between any two packets to be the packet length of the former divided by the allowed rate. If the second packet arrives before that time — ahead of schedule — it is dropped.

The tracking method called "leaky bucket" is used to check conformance, if a non-zero tolerance is specified. The scheduled arrival time is calculated as described before, but the next packet may arrive a certain time before schedule (tolerance value divided by the average rate).

Note: When used in "source class" mode, this command acts on this specific traffic class only. The command can also be used in "source policy" mode where it acts on all traffic classes served further down the hierarchy or it can be used in "profile service-police" mode where it defines a default for all traffic classes of the profile. Settings further down the hierarchy override previous (default) settings.

Warning: for TCP traffic, the use of queueing (wfq or shaping) is recommended.

Example

The following example limits the source to 64 kilobits allowing 0.5 seconds of jitter:

```
SN(cfg)#profile service-policy sample
SN(pf-srvpl)[sample]#source class xxx
SN(src)[xxx]#police 64 burst-size 32
```

Related Commands

None

priority

[no] priority

Function

allow source class to bypass the link scheduler

Syntax Description

Option	**Description**
This command has no keywords or options	

Default

None

Mode

Source

Command Usage

When given "priority" the traffic source is not affected by the link scheduling. The packet is immediately forwarded and never delayed. Bandwidth not used by the "priority" traffic is given to the other traffic sources according to the profile.
Packet markings (set ip dscp, etc.) can be applied to "priority" traffic but all queueing-related commands (queue-limit, rate, share, random-detect, etc.) have no effect on this source.

Warning: make sure that priority is only given to well-behaving inherently limited sources (e.g. voice traffi generated by the SmartNode). If the priority traffic exceeds the rate-imit of the profile erratic behaviour will result.

Example

The following example allows the voice traffic generated by the SmartNode to bypass the link scheduler. If voice traffic currently used 200 kilobits the remaining 300 kilobits will be equally shared by the ACL-classified source "web" the all the other sources ("default").

```
SN(cfg)#profile service-policy sample
SN(pf-srvpl)[sample]#rate-limit 500
SN(pf-srvpl)[sample]#source class local-voice
SN(src)[local-v~]#priority
SN(pf-srvpl)[sample]#source class web
SN(src)[web]#share 50
SN(pf-srvpl)[sample]#source class default
SN(src)[default]#share 50
```

Related Commands

Command	**Description**

rate-limit	Limit interface rate

queue-limit

[no] queue-limit <*value*>

Function

Define maximum queue length for this traffic source

Syntax Description

Option	**Description**
<*value*>	number packets that can be queued

Default

Queue-limit 16

Mode

Source
When used in "source class" mode, this command acts on this specific traffic class only. The command can also be used in "source policy" mode where it acts on all traffic classes served further down the hierarchy or it can be used in "profile service-police" mode where it defines a default for all traffic classes of the profile. Settings further down the hierarchy override previous (default) settings.

Command Usage

Use this command to define the size of the queue used for this traffic source. For TCP traffic a bigger queue size allows more parallel connections to achieve a window size suffiscient for the round-trip time.

Warning: to protect the system from running out of packet memory the overall number of packets queued in all link scheduler queues is limited (200 packets in the current releases). Degraded performance will result if this limit is frequently reached.

Example

The following example shows the use of the command in different modes: the queue limit of 10 defined in the service-policy profile acts as a default value and is therefore used for the sources "A" and the "default", whereas source "B" has an explicit setting of 30 overriding the previous value.

```
SN(cfg)#profile service-policy sample
SN(pf-srvpl)[sample]#rate-limit 500
SN(pf-srvpl)[sample]#queue-limit 10
SN(pf-srvpl)[sample]#source class A
SN(src)[A]#share 40
SN(pf-srvpl)[sample]#source class B
SN(src)[B]#share 40
SN(src)[B]#queue-limit 30
SN(pf-srvpl)[sample]#source class default
SN(src)[local-v~]#share 20
```

Related Commands

None

random-detect

[no] random-detect [<*burst-tolerance*> **]**

Function

Use RED to handle overload situations with many long-lasting TCP connections like email traffic.

Syntax Description

Option	**Description**
<*burst-tolerance*>	optional: burst tolerance index (value in the range from 1 to 10), default if omitted is 4

Default

None

Mode

Source

Command Usage

TCP streams continually increment their window size until they somewhere cause a router queue to overflow, which causes a packet to be lost. Thereafter the TCP source resumes transmission with half the window size – again slowly incrementing. Under some circumstances this saw-tooth behaviour of multiple TCP sources may get synchronized because once a queue is full, several streams will suffer from packet loss. A bad situation occurs, when many sources oscillate synchronously and half of the network bandwidth remains unused. To avoid this effect a scheme called random early detect (RED) has been proposed which radomly drops packets even before the queue is completely full. The drop probability grows with the queue-length.
The optional burst-tolerance parameter specifies a filter that avarages the queue-length to allow bursts to pass when the average load is low. The averaging uses a weighted sum where the current value has weight ${}^{1}\!/_{2}{}^{b}$ and the previous average has weight $1-{}^{1}\!/_{2}{}^{b}$ where *b* is the burst-tolerance parameter.

Warning: for short transfers like web page requests the use of RED is not recommended. Use a larger queue instead.

Example

The following example enables RED for mail traffic with the default burst-tolerance, which is recommended (given the traffic is suitably classified):

```
    SN(cfg)#profile service-policy sample
    SN(pf-srvpl)[sample]#source class mail
    SN(src)[mail]#random-detect
```

Related Commands

Command	Description
queue-limit	Define maximum queue length for this traffic source

rate

rate <*kilobits*>

Function

Bit-rate specification for shaper (kilobits)

Syntax Description

Option	Description
<*kilobits*>	Bandwidth limit for this source

Default

None

Mode

Source

Command Usage

Use this command to specify the maximum bitrate to which the source is to be limited. If more packets arrive they are queued and if the queue overflows they are dropped. Shaping is useful if a traffic source must be rate-limited to obey to an agreement with the provider.

Warning: if the service-policy profile this source belongs to is not configured for "shaper" mode, the setting has no effect.

Example

The following example specifies that traffic source A is shaped to 128 kbps:

```
SN(cfg)#profile service-policy sample
SN(pf-srvpl)[sample]#mode shaper
SN(pf-srvpl)[sample]#source class A
SN(src)[A]#rate 128
```

Related Commands

Command	Description
mode	Set arbitration scheme of selected service policy profile

set ip dscp

[no] set ip dscp *<value>*

Function

Select the DiffServ marking

Syntax Description

Option	**Description**
ip	ip layer
dscp	select DiffServ marking
<value>	Differentiated Services Code Point value

Default

By default the DCSP value of routed packets is unchanged, packets generated by the SmartNode have a value of 0.

Mode

Source

Command Usage

Packet markings are used to take advantage of network QoS feature. The “set” commands put information in the IP packet header to inform other routers about the type of data contained in the packet.

Use the “set ip dscp” command to specify the Differentiated Services Code Point marking to be applied to the packet.

Example

The following example specifies packets from traffic source A to be marked with the dscp value of 47:

```
SN(cfg)#profile service-policy sample
SN(pf-srvpl)[sample]#source class A
SN(src)[A]#set ip dscp 47
```

Related Commands

Command	**Description**
set ip tos	Define the type of service (TOS) value
set ip precedence	Select precedence marking
set layer2 cos	Select class of service (COS) marking

set ip precedence

[no] set ip precedence <*value*>

Function

select precedence marking

Syntax Description

Option	Description
ip	ip layer
precedence	select precedence marking
<*value*>	precedence field value

Default

By default the precedence value of routed packets is unchanged, packets generated by the SmartNode have a value of 0.

Mode

Source

Command Usage

Packet markings are used to take advantage of network QoS feature. The “set” commands put information in the IP packet header to inform other routers about the type of data contained in the packet.
Use the “set ip precedence” command to specify the Precedence marking to be applied to the packet.

Example

The following example specifies packets from traffic source A to be marked with the the precedemce value of 3:

```
SN(cfg)#profile service-policy sample
SN(pf-srvpl)[sample]#source class A
SN(src)[A]#set ip precedence 3
```

Related Commands

Command	Description
set ip tos	Define the type of service (TOS) value
set ip dscp	Select DiffServ marking
set layer2 cos	Select class of service (COS) marking

set ip tos

[no] set ip tos <*value*>

Function

Define the type of service (TOS) value

Syntax Description

Option	**Description**
<*value*>	TOS field field value

Default

By default the TOS value of routed packets is unchanged, packets generated by the SmartNode have a value of 0.

Mode

Source

Command Usage

Packet markings are used to take advantage of network QoS feature. The “set” commands put information in the IP packet header to inform other routers about the type of data contained in the packet.
Use the “set ip tos” command to specify the Type-of-Service field value to be applied to the packet.

Example

The following example specifies packets from traffic source A to be marked with the type-of-service of 4:

```
SN(cfg)#profile service-policy sample
SN(pf-srvpl)[sample]#source class A
SN(src)[A]#set ip tos 4
```

Related Commands

Command	**Description**
set ip dscp	Select the DiffServ marking
set ip precedence	Select precedence marking
set layer2 cos	Select the class of service (COS) marking

set layer2 cos

[no] set layer2 cos <*value*>

Function

Select the class of service (COS) marking

Syntax Description

Option	**Description**
layer2	layer 2
cos	select class of service (COS) marking
<*value*>	COS value

Default

By default the class of service value of routed packets is unchanged, packets generated by the SmartNode have a value of 0.

Mode

Source

Command Usage

Packet markings are used to take advantage of network QoS feature. The “set” commands put information in the IP packet header to inform other routers about the type of data contained in the packet.
Use the “set layer2 cos” command to specify the layer 2 class-of-service marking that has to be applied to the packet.

Warning: the port must be configured for a suitable encapsulation and frame-format for the setting to have an effect – e.g. an Ethernet port must be configured for “frame-format dot1q”.

Example

The following example specifies packets from traffic source A to be marked with layer two class-of-service 3:

```
SN(cfg)#profile service-policy sample
SN(pf-srvpl)[sample]#source class A
SN(src)[A]#set layer2 cos 3
```

Related Commands

Command	**Description**
set ip dscp	Select the DiffServ marking
set ip precedence	Select precedence marking
set ip tos	Define the type of service (TOS) value

share

share *<percentage>*

Function

Fair Queueing weight (relative to other sources)

Syntax Description

Option	**Description**
<percentage>	relative weight of this source

Default

If more than one source is listed for a service-policy profile running in weighted fair queueing mode, a "share" value must explicitely be specified. It can be omitted only if a single source receives all the bandwidth.

Mode

Source

Command Usage

Use this command to define the ratio by which the bandwidth is shared among the sources in "weighted fair queueing" (WFQ) mode.
The percentages specified for the different sources need not add up to 100%. In fact you might as well specify 3:1 for 75:25, but percentage values are easier to read.

Example

The following example web traffic gets three times the bandwidth of the remaining traffic:

```
SN(cfg)#profile service-policy sample
SN(pf-srvpl)[sample]#source class web
SN(src)[web]#share 75
SN(src)[web]exit
SN(pf-srvpl)[sample]#source class default
SN(src)[default]#share 25
```

The next example shows a case where a "share"setting is not needed. The voice traffic bypasses the link scheduler and the remaining "default" is the only source.

```
SN(cfg)#profile service-policy sample
SN(pf-srvpl)[sample]#source class local-voice
SN(src)[web]#priority
SN(src)[web]exit
SN(pf-srvpl)[sample]#source class default
```

Related Commands

Command	Description
mode	Set arbitration scheme of selected service policy profile
rate	Bit-rate specification for shaper (kilobits)

source

[no] source { (class <*source-name*> **) | (policy** <*source-name*> **) }**

Function

Enter source configuration mode

Syntax Description

Option	Description
class	for an ACL class
<*source-name*>	Traffic class name (as defined in ACL)
policy	for a hierarchical policy-map
<*source-name*>	Name of the sub-arbiter

Default

None

Mode

Source

Command Usage

Use this command to have a (traffic) source scheduled by the service-policy profile you are editing. The source command defines a separate handling for a specific traffic class or hierarchically referenced service-policy profile.

For the “source class” mode, the traffic class must either be defined with a permit criteria of the ACL or it can be one of the predefined classes listed in Table 9-2 below.

The “source policy” mode connects the output of another service-policy profile to the current profile – thereby defining a hierarchical link scheduler.

A source statement for the class “default” is mandatory for each link scheduler – you must specify how much bandwidth is given to the remaining sources, but only in one of the profiles for hierarchical schedulers.

Class Name	Usage
local-voice	voice traffic generated by the SmartNode
local-default	remainig traffic generated by the SmartNode (signalling and anagement)
default	the rest of the traffic (unclassifed or clases not listed as sources in the service-policy profile)

Table 9-2: Predefined Traffic Classes

Example

The following example shows a rather complex service-policy profile “sample” which schedules a 512 kbps link. Voice packets from the SmartNode get priority and the remaining bandwidth is arbitrated among four sources. Two of these soures (web, mail) have been “identified” using an ACL permit criteria, one source (vpn_limiter) is the output of the second arbiter and “default” is the predefined source name for the *rest of the packets* which do not fall into any of the other listed source classes. Even if a packet has been assigned a class-name in the active ACL, if that class-name is not listed as a “source” the packet gets “default” service. Note: the “exit” statements are not needed in this context as the previous source is implicitely left when you enter the new one.

```
SN(cfg)#profile service-policy sample
SN(pf-srvpl)[sample]#rate-limit 512
SN(pf-srvpl)[sample]#source class local-voice
SN(src)[local-v~]#priority
SN(src)[web]#exit
SN(pf-srvpl)[sample]#source class web
SN(src)[web]#share 20
SN(src)[web]#queue-limit 40
SN(src)[web]#exit
SN(pf-srvpl)[sample]#source class mail
SN(src)[mail]#share 10
SN(src)[mail]#exit
SN(pf-srvpl)[sample]#source policy vpn_limiter
SN(src)[vpn_lim~]#share 40
SN(src)[vpn_lim~]#exit
SN(pf-srvpl)[sample]#source class default
SN(src)[default]#share 20
SN(src)[default]#exit
SN(pf-srvpl)[sample]#exit

SN(cfg)#profile service-policy vpn_limiter
SN(pf-srvpl)[vpn_lim~]#mode shaper
SN(pf-srvpl)[vpn_lim~]#source class link_1
SN(src)[link_1]#rate 128
SN(src)[link_1]#exit
SN(pf-srvpl)[vpn_lim~]#source class link_2
SN(src)[link_2]#rate 64
SN(src)[link_2]#exit
SN(pf-srvpl)[vpn_lim~]#exit
SN(cfg)#
```

Related Commands

None

10 PROFILE NAPT MODE

10.1 Command Overview

In this mode you may configure a SmartNode's Network Address Port Translation (NAPT). Two key problems facing the Internet are depletion of IP address space and scaling in routing. NAPT is a feature that allows the IP network of an organization to appear from the outside to use different IP address space than that which it is actually using. Thus, NAPT allows an organization with nonglobally routable addresses to connect to the Internet by translating those addresses into globally routable address space. NAPT also allows a more graceful renumbering strategy for organizations that are changing service providers or voluntarily renumbering into classless interdomain routing (CIDR) blocks. NAPT is described in RFC 1631.

The commands that are available in this mode are listed in Table 10-1 below:

Command	Description
icmp default	Set default ICMP server
profile napt	Create Network Address Port Translation (NAPT) profile
static	Appends or removes static NAPT entry

Table 10-1: Commands available in Profile NAPT Mode

icmp default

[no] icmp default <*host*>

Function

Set default ICMP server

Syntax Description

Option	Description
<*host*>	IP address of the host in the local network that shall get ICMP messages from the global network.

Default

None

Mode

Profile NAPT

Command Usage

ICMP Requests and Responses do not have port numbers to determine the disired destination. Only the destination IP address is used when forwarding ICMP Request/Response packets. NAPT handles this situation by providing a single default IP address for all ICMP Requests from the global network. This address can either be another address for the local router or a private address.
The no form configures that ICMP messages are not forwarded to the local network.

Example

The following example configures the local host 10.0.0.2 to be the destination of received ICMP Requests from the global network:

```
SN(cfg)#profile napt global
SN(pf-napt)[global]#icmp default 10.0.0.2
```

Related Commands

Command	Description
profile napt	Creates or removes NAPT profiles
static	Adds or removes static translation entries
use profile napt	Binds a NAPT profile to an interface
show profile napt	Displays information about a NAPT profile
show interface napt	Displays information about the NAPT binding of an interface

profile napt

[no] profile napt <*napt-profile_name*>

Function

Create Network Address Port Translation (NAPT) profile

Syntax Description

Option	Description
<*napt-profile_name*>	Network Address Port Translation profile name

Default

None

Mode

Profile NAPT

Command Usage

The Network Address Port Translation (NAPT) uses a single IP address to interface numerous “corporate” hosts to the Internet. All the hosts on the global side (global interface) view all hosts on the local side (local interface) as a single Internet host. The local hosts continue to use their corporate addresses.

The translation is not based solely upon IP addresses but the TCP/UDP port number and ICMP message IDs used by applications when communicating to each other.

A NAPT profile can be bound to the global interface. The profile defines, which packets to ports destined to the global interface should be forwarded to which hosts on the local network. Furthermore, a host can be specified to get all ICMP messages, the ICMP default server.

This command creates and enters new profiles or enters existing profile. After entering the profile, the commands **static** and **icmp default** are available to configure the profile. The no form removes an existing profile.

Example

The following example creates a new NAPT profile with name “global”:

```
SN(cfg)#profile napt global
```

The next example removes the existing “global” NAPT profile:

```
SN(cfg)#no profile napt
```

Related Commands

Command	Description
icmp default	Configures the ICMP default server

static	Adds or removes static translation entries
use profile napt	Binds a NAPT profile to an interface
show profile napt	Displays NAPT profile information
show interface napt	Displays NAPT binding of an interface

static

[no] static *<protocol> <port> <host>*

Function

Appends or removes static NAPT entry

Syntax Description

Option	Description
<protocol>	May take the value "udp" or "tcp". Defines that a port of the specified transport layer protocol is translated
<port>	Destination port number of the specified transport protocol.
<host>	Destination IP address the packet's destination new destination in the local network.

Default

None

Mode

Profile NAPT

Command Usage

Adds a static NAPT translation entry. An entry contains the transport layer protocol and the transport layer destination port number to select packets received on the global port. If received packets match, they are forwarded to the specified destination host in the local network. This allows for example to forward Web traffic (TCP port 80) to a web server in the local network. The no form removes a static entry.

Warning: Modifications of static entries in a NAPT profile that is bound to an IP interface reconfigure the static port-mapping table of the router immediately. Although, if you remove a static entry, the router continues forwarding packets to the previousely-configured host in the local network until the connection terminates or a timeout occurs.

Example

The following example adds a static translation entry. All packets received TCP packets on the global interface to port 80 are forwarded to the local network host 10.0.0.2:

```
SN(cfg)#profile napt global
SN(pf-napt)[global]#static tcp 80 10.0.0.2
```

The next example removes the previously added static entry from the mapping table:

```
SN(pf-napt)[global]#no static tcp 80
```

Related Commands

Command	Description
profile napt	Creates or removes NAPT profiles
icmp default	Configures the ICMP default server
use profile napt	Binds a NAPT profile to an interface
show profile napt	Displays NAPT profile information
show interface napt	Displays the NAPT profile binding of an IP interface

11 PROFILE CALL-PROGRESS-TONE MODE

11.1 Command Overview

The tones informing about the call state are refered to as *call-progress-tones*. A call progress tone can be a tone you hear when you lift the handset and the network is ready, a tone you hear when the called party number is complete and the remote extension is ringing, or a tone you hear when the remote extension is busy. Fifteen tones can be configured with their frequency and duration characteristics. The configuration for each tone is stored in so called "call-progress-tone profile". In this mode you may configure a SmartNode's call-progress-tone profile.

The commands that are available in this mode are listed in Table 11-1 below:

Command	Description
high-frequency	Configure tone high frequency
high-frequency-level	Configure call-progress tone high frequency level
low-frequency	Configure tone low frequency
low-frequency-level	Configure call-progress tone low frequency level
off1	Configure tone interspace 1
off2	Configure tone interspace 2
on1	Configure tone duration 1
on2	Configure tone duration 2
profile call-progress-tone	Enter call-progress tone configuration mode

Table 11-1: Commands available in Profile Call-Progress-Tone Mode

high-frequency

high-frequency <*high_frequency*>

Function

Configure tone high frequency

Syntax Description

Option	Description
<*high_frequency*>	Frequency in Hz

Default

The default <*high_frequency*> option is the default value for call-progress-tone defaultDialtone: 0 Hz (this means the high frequency is not played back).

Mode

Profile Call-Progress-Tone

Command Usage

Defines the frequency of the higher of the two sine waves that define a call-progress tone.

Warning: 0 Hz should only be used together with **high-frequency-level mute**.

Example

The following example configures the high frequency of the call-progress tone named ‘myTone’ to 425 Hz

```
    SN(pf-callp)[myTone1]#high-frequency 425
```

Related Commands

Command	Description
low-frequency	Configure tone low frequency

high-frequency-level

high-frequency-level { mute | <*high_frequency_level*> **}**

Function

Configure call-progress tone high frequency level

Syntax Description

Option	Description
mute	Mute high frequency completely
<*high_frequency_level*>	Frequency Level in dBm, from –31dBm to +3dBm

Default

The default <*high_ frequency_level* > option is the default value for call-progress-tone defaultDialtone: **mute** (this means the high frequency is not played back).

Mode

Profile Call-Progress-Tone

Command Usage

Defines the level of the higher of the two sine waves that define a call-progress tone.

Example

The following example configures the high frequency level of the call-progress tone named 'myTone' to 0dBm

```
SN(pf-callp)[myTone1]#high-frequency-level 0
```

Related Commands

Command	Description
low-frequency level	Configure call-progress tone low frequency level

low-frequency

low-frequency <*low_frequency*>

Function

Configure tone low frequency

Syntax Description

Option	Description
<*low_frequency*>	Frequency in Hz

Default

The default <*low_frequency*> option is the default value for call-progress-tone defaultDialtone: 425 Hz (This value may differ according to the country).

Mode

Profile Call-Progress-Tone

Command Usage

Defines the frequency of the lower of the two sine waves that define a call-progress tone.

Warning: 0 Hz should only be used together with **low-frequency-level mute**.

Example

The following example configures the low frequency of the call-progress tone named ‘myTone’ to 425Hz

```
SN(pf-callp)[myTone1]#low-frequency 425
```

Related Commands

Command	Description
high-frequency	Configure tone high frequency

low-frequency-level

low-frequency-level { mute | <*low_frequency_level*> }

Function

Configure call-progress tone low frequency level

Syntax Description

Option	Description
mute	Mute low frequency completely
<*low_frequency_level*>	Frequency Level in dBm, from –31dBm to +3dBm

Default

The default <*low_ frequency_level* > option is the default value for call-progress-tone defaultDialtone: **0** (This value may differ according to the country).

Mode

Profile Call-Progress-Tone

Command Usage

Defines the level of the lower of the two sine waves that define a call-progress tone.

Example

The following example configures the low frequency level of the call-progress tone named 'myTone' to 0dBm

```
    SN(pf-callp)[myTone1]#low-frequency-level 0
```

Related Commands

Command	Description
high-frequency level	Configure call-progress tone high frequency level

off1

off1 <*off1*>

Function

Configure tone interspace 1

Syntax Description

Option	Description
<*off1*>	Duration in ms

Default

The default <*off1*> option is the default value for call-progress-tone defaultDialtone: 0 (This value may differ according to the country).

Mode

Profile Call-Progress-Tone

Command Usage

Each call-progress tone is played in a cadenced pattern of tone and silence. This command defines the duration of the first silence phase (interspace between first and second tone phase).

Example

The following example configures the tone interspace 1 of the call-progress tone named 'myTone' to 1 second

```
    SN(pf-callp)[myTone1]#off1 1000
```

Related Commands

Command	Description
on1	Configure tone duration 1

off2

off2 <*off1*>

Function

Configure tone interspace 2

Syntax Description

Option	**Description**
<*off2*>	Duration in ms

Default

The default <*off2*> option is the default value for call-progress-tone defaultDialtone: 0 (This value may differ according to the country).

Mode

Profile Call-Progress-Tone

Command Usage

Each call-progress tone is played in a cadenced pattern of tone and silence. This command defines the duration of the second silence phase (interspace between second tone and first tone phase).

Example

The following example configures the tone interspace 2 of the call-progress tone named 'myTone' to half a second

```
SN(pf-callp)[myTone1]#off2 500
```

Related Commands

Command	**Description**
on2	Configure tone duration 2

on1

on1 <*on1*>

Function

Configure tone duration 1

Syntax Description

Option	Description
<*on1*>	Duration in ms

Default

The default <*on1*> option is the default value for call-progress-tone defaultDialtone: 5000 (This value may differ according to the country).

Mode

Profile Call-Progress-Tone

Command Usage

Each call-progress tone is played in a cadenced pattern of tone and silence. This command defines the duration of the first tone phase.

Example

The following example configures the tone duration 1 of the call-progress tone named ‘myTone’ to one second

```
SN(pf-callp)[myTone1]#on1 1000
```

Related Commands

Command	Description
off1	Configure tone interspace 1

on2

on2 <*on2*>

Function

Configure tone duration 2

Syntax Description

Option	Description
<*on2*>	Duration in ms

Default

The default <*on2*> option is the default value for call-progress-tone defaultDialtone: 0 (This value may differ according to the country).

Mode

Profile Call-Progress-Tone

Command Usage

Each call-progress tone is played in a cadenced pattern of tone and silence. This command defines the duration of the second tone phase.

Example

The following example configures the tone duration 2 of the call-progress tone named ‘myTone’ to 250 milliseconds

```
SN(pf-callp)[myTone1]#on2 250
```

Related Commands

Command	Description
off2	Configure tone interspace 2

profile call-progress-tone

[no] profile call-progress-tone <*name*>

Function

Enter call-progress tone configuration mode / add a new call-progress tone

Syntax Description

Option	**Description**
<*name*>	Call-progress tone name

Default

Adding a new call-progress tone profile (i.e. typing for <*name*> a name that is not yet given to a call-progress-tone) will give the default dial tone parameters to the new profile (see default values of mode commands **highFrequency**, **lowFrequency**, **highFrequencyLevel**, **lowFrequencyLevel**, **on1**, **off1**, **on2**, **off2**).

Mode

Administrator exec

Command Usage

If a new call-progress tone needs to be added to the playable tones, this command creates one.
If a call-progress tone is no more needed, this command with the **[no]** prefix removes it.
If a call-progress tone's parameters need to be changed, this command enters the configuration mode

Warning: Only 15 different call-progress tones can be configured at a time.

Example

The following example adds the tone with name 'dialToneGB' to the set of known tones.

```
SN(cfg)#profile call-progress-tone dialToneGB
```

The next example removes the tone profile created above:

```
SN(cfg)#no profile call-progress-tone dialToneGB
```

Related Commands

Command	**Description**
profile tone-set	Enter tone set profile configuration

12 PROFILE TONE-SET MODE

12.1 Command Overview

In this mode you may configure a SmartNode’s tone set. Several tones can be configured with their frequency and duration characteristics. The setting for each of the tones is stored in so called *call-progress-tone profile* as desribed in Chapter XX, “XX”, in this guide. A set of these tones is later mapped to their respective call state in a *tone-set profile*. The tone-set profile is used by the CS context and applies to all PSTN interfaces on the CS context.

The commands that are available in this mode are listed in Table 12-1 below:

Command	Description
map	Map a sessioncontrol tone event to a configured call-progress tone
profile tone-set	Enter tone set profile configuration mode

Table 12-1: Commands available in Profile Tone-Set Mode

map

[no] map { (call_progress_tone *<internal_tone_name> <call_progress_tone_name>* **) }**

Function

Map a sessioncontrol tone event to a configured call-progress tone

Syntax Description

Option	Description
<internal_tone_name>	Internal tone name
<call_progress_tone_name>	Call-progress tone name

Default

The following mappings are defaults:

dialtone	=	default dial tone
alertingtone	=	default alerting tone
busytone	=	default busy tone

Mode

Profile Tone-Set

Command Usage

Sessioncontrol wants to play several tones: dialtone, alertingtone, busytone (called ‘internal tones’).
To define how these tones sound like, the tone-set profile provides a mapping to configured call-progress tones.
Note that each tone-set profile can define a different mapping, and that only the use of the profiles defines which mapping applies.
The command has immediate effect, but does not influence existing voice connections.

Example

The following example replaces the ‘defaultDialtone’ call-progress tone by the ‘dialtoneGB’ in the ‘mySet’ tone-set profile.
When configured, sessioncontrol plays the new ‘dialtoneGB’ if the ‘default’ tone-set is used.

```
SN(pf-tones)[mySet]#no map dialtone defaultDialtone
SN(pf-tones)[mySet]#map dialtone dialtoneGB
```

Related Commands

Command	Description
profile call-progress tone	Enter call-progress tone confiuguration mode
use tone-set-profile	Link tone-set profile to the selected interface

profile tone-set

profile tone-set <*name*>

Function

Enter tone set profile configuration mode

Syntax Description

Option	Description
<*name*>	Name of the tone set

Default

One tone-set profile with ‘default’ as <*name*> is configured.

Mode

Administrator exec

Command Usage

If a new tone-set needs to be added, this command creates one (<*name*> can be chosen arbitrarily, max. 25 characters long).
If a tone-set is no more needed, this command with the **[no]** prefix removes it.
If a tone-set’s parameters need to be changed, this command enters the configuration mode

Example

The following example creates a new tone-set called ‘mySet’

```
SN(cfg)#profile tone-set mySet
SN(pf-tones)[mySet]#
```

Now call-progress tones can be mapped using the **map** command.

Related Commands

Command	Description
map	Map a sessioncontrol tone event to a configured call-progress tone
use tone-set-profile	Link tone-set profile to the selected interface

13 PROFILE VOIP MODE

13.1 Command Overview

In this mode you may configure a SmartNode's Voice over Internet Protocol parameters. A VoIP profile summarizes the most relevant settings for VoIP connections and is assigned to the VoIP gateways H.323 or ISoIP. Each VoIP gateway must use a VoIP profile. The settings in the VoIP profile apply to all calls going through that gateway. The configurable components are as follows:

- Dejitter Buffer
- DTMF Relay
- Echo canceller
- Silence Compression and Comfort Noise
- Voice Volume gain
- Post and High-Pass Filters

Changing voice settings can improve or degrade the quality of the transmitted voice data. Many of the default values of these components have configured defaults and should only be overwritten if required.

The commands that are available in this mode are listed in Table 13-1 below:

Command	Description
dejitter-grow-attenuation	Set dejitter grow attenuation parameter
dejitter-grow-step	Set dejitter grow step parameter
dejitter-max-delay	Set dejitter maximal delay
dejitter-max-packet-loss	Set dejitter maximal packet loss
dejitter-mode	Set dejitter buffer operation mode
dejitter-shrink-speed	Set dejitter shrink speed parameter
dtmf-relay	Enables or disables DTMF relay
echo-canceller	Enable or disable the echo canceller
high-pass-filter	Enable ordisable the high pass filter
post-filter	Enable or disable the post filter
profile voip	Enter the VoIP profile
silence-compression	Enable or disable silence compression or comfort noise generation

Table 13-1: Commands available in Profile VoIP Mode

dejitter-grow-attenuation

dejitter-grow-attenuation <*dejitter_grow_attenuation*>

Function

Set dejitter grow attenuation parameter

Syntax Description

Option	Description
<*dejitter_grow_attenuation*>	Dejitter grow attenuation

Default

<*dejitter_grow_attenuation*> is 1.

Mode

Profile VoIP

Command Usage

This command sets the attenuation factor for the growth of the adaptive dejitter buffer (in static dejitter mode, the command has no effect).
If the dejitter buffer recognizes increased jitter on the network, it may want to increase its size in order to handle the jitter correctly. The **dejitter-grow-attenuation** can limit the speed of dejitter buffer size growth.

Warning: This command should only be used if the adaptive operation mode of the dejitter buffer is well known. Wrong usage can lead to dejitter buffer size instability and bad voice quality.

Example

The following example sets the grow attenuation to 2.

```
SN(pf-voip)[myVoip]#dejitter-grow-attenuation 2
```

Related Commands

None

dejitter-grow-step

dejitter-grow-step <*dejitter_grow_step*>

Function

Set dejitter grow step parameter

Syntax Description

Option	**Description**
<*dejitter_grow_step*>	Dejitter grow step [voice packets]

Default

<*dejitter_grow_ step*> is 1.

Mode

Profile VoIP

Command Usage

This command sets the grow step for the growth of the adaptive dejitter buffer (in static dejitter mode, the command has no effect).
If the dejitter buffer recognizes increased jitter on the network, it may want to increase its size in order to handle the jitter correctly. The **dejitter-grow-step** command tells it how many more voice packets it should buffer in one growth step.
Note that according to the used packetization period and codec, the grow step has different effect on the resulting dejitter delay variation.

Warning: This command should only be used if the adaptive operation mode of the dejitter buffer is well known. Wrong usage can lead to dejitter buffer size instability and bad voice quality.

Example

The following example sets the grow step to 2.

```
SN(pf-voip)[myVoip]#dejitter-grow-step 2
```

Related Commands

None

dejitter-max-delay

dejitter-max-delay <*dejitter_max_delay*>

Function

Set dejitter maximal delay

Syntax Description

Option	Description
<*dejitter_max_delay*>	Dejitter max delay [milliseconds]

Default

< *dejitter_max_delay* > is 60ms

Mode

Profile VoIP

Command Usage

This command sets the maximum delay that the dejitter buffer is allowed to introduce in the voice path. The influence is different for static and adaptive mode.
Static mode: The dejitter buffer tries to hold a constant (static) delay of half the configured max-delay, but may maximally introduce the configured max-delay.
Adaptive mode: The dejitter buffer tries to minimize its delay. If network jitter is large, it may maximally introduce the configured max-delay.

Example

The following example sets the dejitter max delay to 100ms.

```
SN(pf-voip)[myVoip]#dejitter-max-delay 100
```

Related Commands

None

Command	Description
dejitter-mode	Set dejitter buffer operation mode

dejitter-max-packet-loss

dejitter-max-packet-loss <*dejitter_max_packet_loss*>

Function

Set dejitter maximal packet loss

Syntax Description

Option	**Description**
<*dejitter_max_packet_loss*>	Maximum packet loss

Default

< *dejitter_max_packet_loss* > is 4

Mode

Profile VoIP

Command Usage

This command tells the adaptive dejitter buffer how many packets may be lost due to buffer overflow before it decides to increase the buffer size. The command has no influence in static mode.

Warning: This command should only be used if the adaptive operation mode of the dejitter buffer is well known. Wrong usage can lead to dejitter buffer size instability and bad voice quality.

Example

The following example sets the maximum packet loss to 3, and thus decreases reaction time on increased jitter compared to the default value.

```
SN(pf-voip)[myVoip]#dejitter-max-packet-loss 3
```

Related Commands

None

dejitter-mode

dejitter-mode { adaptive | static }

Function

Set dejitter buffer operation mode

Syntax Description

Option	Description
adaptive	Set adaptive dejitter buffer mode
static	Set static dejitter buffer mode

Default

The adaptive dejitter buffer mode is set by default.

Mode

Profile VoIP

Command Usage

Two different modes of dejitter buffer exists. The main difference between them lies in the handling of the delay they introduce in the voice path.
Static mode tries to hold a constant (static) delay of half the configured dejitter-max-delay, but may maximally introduce the configured dejitter-max-delay. It is suited for networks with known and non-fluctuating jitter, or applications where voice path delay is no concern (e.g. fax or data transmission).
Adaptive mode tries to minimize the delay. If network jitter is large, it may maximally introduce the configured max-delay. It is suited for networks with unknown jitter properties and applications where voice path delay is a major concern.

Warning: As adaptive mode may intentionally drop voice packets to decrease buffer size, it is not suited for fax or data transmission.

Example

The following example sets the dejitter mode to static.

```
SN(pf-voip)[myVoip]#dejitter-mode static
```

Related Commands

Command	Description
dejitter-max-delay	Set dejitter maximal delay

dejitter-shrink-speed

dejitter-shrink-speed <*dejitter_shrink_speed*>

Function

Set dejitter shrink speed parameter

Syntax Description

Option	**Description**
<*dejitter_shrink_speed*>	Dejitter shrink speed [voice packets]

Default

None

Mode

Profile VoIP

Command Usage

This command sets the speed of size decrease of the adaptive dejitter buffer (in static dejitter mode, the command has no effect). It tells the dejitter buffer, how many packets it should drop to decrease voice path delay when low network jitter is detected.
Note that according to the used packetization period and codec, the shrink speed has different effect on the resulting dejitter delay variation.

Warning: This command should only be used if the adaptive operation mode of the dejitter buffer is well known. Wrong usage can lead to dejitter buffer size instability and bad voice quality.

Example

The following example sets the shrink speed to 2, thus increasing the influence of detected low network jitter on the delay introduced in the voice path.

```
SN(pf-voip)[myVoip]#dejitter-shrink-speed 2
```

Related Commands

None

dtmf-relay

dtmf-relay

Function

Enables or disables DTMF relay

Syntax Description

Option	Description
This command has no keywords or options	

Default

By default DTMF relay is enabled.

Mode

Profile VoIP

Command Usage

DTMF tones coming from local ISDN side can be transported in two ways over the IP network, and **dtmf-relay** toggles between these two operations.
In-band: DTMF tones are encoded locally with the voice stream, and decoded at the remote side.
Relayed: DTMF tones are detected locally, and their transmission in the voice stream is suppressed. The signalling application (e.g. H.323 or isoip) is in charge to signal the DTMF digit to the remote side, where the digit is reproduced by the DSP.

Warning: Do not disable DTMF relay if using coders with a lower bitrate than G.711. DMTF tones would be transported in-band, and distorted by the compression / decompression operations. Correct detection at the remote side won't be possible.

Warning: Make sure that DTMF relay has the same value on the transmitting / receiving side for correct interoperation.

Example

The following example switches off dtmf relay

```
SN(pf-voip)[myVoip]#no dtmf-relay
```

Related Commands

None

echo-canceller

echo-canceller

Function

Enable or disable the echo canceller

Syntax Description

Option	Description
This command has no keywords or options	

Default

By default the echo canceller is enabled.

Mode

Profile VoIP

Command Usage

Echoes are generated when two-wire telephone circuits (carrying both transmitted and received signals on the same wire pair) are converted to a four-wire circuit.
The echo canceller reduces, if switched on, the echo that is generated by a device connected to an ISDN port (near end) and echoed back to IP (far end).

Example

The following example switches off the echo canceller

```
SN(pf-voip)[myVoip]#no echo-canceller
```

Related Commands

None

high-pass-filter

high-pass-filter

Function

Enable ordisable the high pass filter

Syntax Description

Option	Description
This command has no keywords or options	

Default

By default the high pass filter is enabled.

Mode

Profile VoIP

Command Usage

In G.723.1, G.729/Annex A and NetCoder coders, a high pass filter is normally used to cancel low-frequent noises at the coder input (from ISDN). When several connections with these coders in sequence are expected, the repeated high pass filtering can cause voice quality degradation. In this case, high-pass filter can be manually switched off.

Example

The following example switches off the high pass filter.

```
SN(pf-voip)[myVoip]#no high-pass-filter
```

Related Commands

None

post-filter

post-filter

Function

Enable or disable the post filter

Syntax Description

Option	Description
This command has no keywords or options	

Default

By default the post filter is enabled.

Mode

Profile VoIP

Command Usage

In G.723.1, G.729/Annex A and NetCoder coders, the voice decoder output is normally filtered using a perceptual post-filter to improve voice quality. When several connections with these coders in sequence is expected, the repeated filtering can cause voice quality degradation. In this case, the post filter can be manually switched off.

Example

The following example switches off the post filter.

```
    SN(pf-voip)[myVoip]#no post-filter
```

Related Commands

None

profile voip

[no] profile voip <*name*>

Function

Enter the VoIP profile

Syntax Description

Option	**Description**
<*name*>	Voip profile name

Default

A default voip profile named 'default' exists. All settings within the profile are set to their defaults.

Mode

Profile VoIP

Command Usage

If a new voip profile needs to be added, this command creates one.
If a voip profile is no more needed, this command with the **[no]** prefix removes it.
If a voip profile's parameters need to be changed, this command enters the configuration mode.

Example

The following example creates a new voip profile with name 'myVoip'.

```
SN(cfg)#profile voip myVoip
SN(pf-voip)[myVoip]#
```

The profile can now be configured.

Related Commands

Command	**Description**
use voip-profile	Link gateway to a VoIP profile

silence-compression

silence-compression

Function

Enable or disable silence compression or comfort noise generation

Syntax Description

Option	Description
This command has no keywords or options	

Default

By default silence compression or comfort noise generation is disabled.

Mode

Profile VoIP

Command Usage

Silence compression is a method to reduce bandwidth usage of voice connections. It exploits the fact that most of the time in a conversation, only one conversation partner is talking and the other one is listening.
A voice activity detector monitors permanently the signal level on the ISDN side of a connection, and waits for the level to fall below a certain threshold. When this happens, transmission of RTP packets is stopped, and only resumed if the level rises again.
The silence compression command is directly linked to the *comfort noise generation*.
If no RTP packets are transmitted, the remote side receives no background noise anymore. This leads subjectively to the impression that the connection is dead. Therefore, if silence compression is enabled, automatically comfort noise generation is enabled, too.

Warning: As silence compression and comfort noise generation are coupled, consider the following:
The DSPs use silence descriptors—statistic descriptions of the local background noise—to transmit comfort noise generation parameters to the remote side. They are always transmitted in the RTP stream if silence compression is switched on.
These silence descriptors are compliant with the standards. But if the remote side cannot interpret them, they may cause voice quality degradation. Switch off silence compression in such cases.

Example

The following example switches on silence compression / comfort noise generation

```
SN(pf-voip)[myVoip]#silence-compression
```

Related Commands

None

14 CONTEXT IP MODE

14.1 Command Overview

In this mode you may configure a SmartNode's IP interfaces. The IP context in SmartWare is a high level conceptual entity that is responsible for all IP related protocols and services for data and voice. In a first approximation the IP context performs the same function as a standalone IP router. The IP context may contain interface static routes. Every context is defined by a name; therefore the IP context is named *router* for default. The IP context is configured using the context IP mode.

The commands that are available in this mode are listed in Table 14-1 below:

Command	Description
context ip	Enter IP context
multicast-send default-interface	Define default interface for multicast messages
route	Configure static IP routes

Table 14-1: Commands available in Context IP Mode

context ip

context ip [*<name>* **]**

Function

Enter IP context

Syntax Description

Option	Description
<name>	Name of the IP context to create and enter. This parameter is optional and set to "router" if omitted.

Default

None

Mode

Context IP

Command Usage

This command creates a new IP router context. At the current time only one IP context ("router") is supported. The IP context contains an IP router with several IP interfaces.

Example

The following examples enters the default ("router") IP context:

```
SN(cfg)#context ip
SN(ctx-ip)[router]#
```

Related Commands

None

multicast-send default-interface

multicast-send default-interface <*ip_interface*>

Function

Define default IP interface for multicast messages.

Syntax Description

Option	**Description**
<*ip_interface*>	Select a predefined IP interface

Default

None

Mode

Context IP

Command Usage

The command **multicast-send default-**interface is used, if it is necessary to define a default IP interface over which multicast messages are sent.

Note: The IP interface has to be defined in the IP context priror to define it as multicast messages interface.

Example

The following example shows how to define default IP interface LAN for multicast messages:

```
SN(ctx-ip)[router]#multicast-send default-interface LAN
```

Related Commands

None

route

route *<destaddr> <destmask>* **{** *<gwaddr>* **|** *<interface>* **} [** *<metric>* **]**

Function

Configure static IP routes

Syntax Description

Option	**Description**
<destaddr>	The IP address of the target network or subnet
<destmask>	A network mask where the 1 bits indicates the network, or subnet, and the 0 bits indicate the host portion of the network address provided
<gwaddr>	The IP address of a next-hop router that can reach the target network or subnet
<interface>	Name of the outgoing IP interface over which the target network or subnet is accessible
<metric>	Specifies the desirability of the route when compared against other routes. The range is 0 through 15, where 0 is the preferred route

Default

If no metric is specified, the static route is assumed to have a metric of 0.

Mode

Context IP

Command Usage

Once configured, a static route stays in the routing table indefinitely. When multiple static routes are configured for a single destination and the outbound interface of the current static route goes down, a backup route is activated.

Each static route can be configured with a metric. The route with the lowest metric is the preferred route. A newly configured static route with a lower cost will override an existing static route that has a higher cost to the same destination.

To configure a default static route use 0.0.0.0 for the network number and mask. A valid nex-hop address or interface is required.

If static routes are redistributed through dynamic routing protocols, only the active static route to a destination is advertised.

The no form of this command deletes a static route from the routing table.

Example

The following example packets to network 10.10.0.0/16 will be routed to the next-hop 10.10.0.1 with the default metric of 0:

```
SN(cfg)#context ip
SN(ctx-ip)[router]#route 10.10.0.0 255.255.0.0 10.10.0.1
```

The next example estabishes a default route with metric 4 to the IP interface pvc1:

```
SN(cfg)#context ip
SN(ctx-ip)[router]#route 0.0.0.0 0.0.0.0 pvc1 4
```

The next example removes the default route:

```
SN(cfg)#context ip
SN(ctx-ip)[router]#no route 0.0.0.0 0.0.0.0 pvc1
```

Related Commands

Command	Description
show ip route	Displays the active IP routing table.

15 INTERFACE MODE

15.1 Command Overview

In this mode you may configure a SmartNode's IP interfaces. Within the SmartWare, an interface is a logical entity that provides higher-layer protocol and service information, such as Layer 3 addressing. Interfaces are configured as part of a context and are independent of physical ports and circuits. The separation of the interface from the physical layer allows for many of the advanced features offered by the SmartWare. For higher-layer protocols to become active, a physical port or circuit must be bound to an interface. Therefore it is possible to bind an IP interface physically to an Ethernet or Frame Relay port, according to the appropriate transport network layer. The interface mode is used to define IP interfaces, setting the interface parameters, and configure ICMP and RIP parameters. Moreover ACL, NAPT and QoS profiles are set into relation with an IP interface using this mode. .

The commands that are available in this mode are listed in Table 15-1 below:

Command	**Description**
cos	Set the default CoS group for incoming traffic on an IP interface
icmp redirect accept	Accept ICMP redirect messages
icmp redirect send	Send ICMP redirect messages
icmp router-discovery	Router advertisement broadcast
interface	Enter interface configuration mode
ipaddress	Set the IP address and netmask of the interface
mtu	Define the MTU for IP Packets sent on that interface
point-to-point	Configure the interface as point-to-point link
rip announce	Enable RIP announcing
rip announce host	Enable RIP announce IP host routes
rip announce static	Enable RIP announce static IP routes
rip auto-summary	Enable RIP auto summarization
rip default-route-value	Set the RIP default route metric
rip learn default	Enable RIP learning using default route advertised by a RIP neighbor
rip learn host	Enable accepting of received IP host routes
rip listen	Enable receive RIP on an interface
rip poison-reverse	Enable the poison reverse algorithm
rip receive version	Select the receive RIP version on an interface
rip route-holddown	Enable holding down aged routes on an interface
rip send version	Select the send RIP version on an interface
rip split-horizon	Enable RIP split-horizon processing on an interface
rip supply	Enable send RIP on an interface
use profile acl	Apply a packet filter to an interface
use profile napt	Apply a NAPT profile to an interface
use profile service-policy	Apply a service policy to an interface

Table 15-1: Commands available in Interface Mode

cos

[**no**] **cos** <*group*>

Function

Set the default CoS group for incoming traffic on an IP interface

Syntax Description

Option	Description
<*group*>	The name of a Class of Service (CoS) group.

Default

None

Mode

Interface

Command Usage

By using this command it is possible to tag all incoming packets with a default CoS group. If the packet matches a rule in the access-list this rule can override the default CoS group.
Use the **no** form of this command to remove the default CoS group from an IP interface.

Example

Set default CoS group for incoming packets to *WebTraffic*. Packets that are not tagged by an access-list rule will be tagged *WebTraffic*.

```
SN(cfg)#context ip router
SN(cfg-ip)[router]#interface eth0
SN(cfg-if)[eth0]#cos WebTraffic
```

Remove default CoS group from an interface.

```
SN(cfg)#context ip router
SN(cfg-ip)[router]#interface eth0
SN(cfg-if)[eth0]#no cos
```

Related Commands

Command	Description
use profile acl	Binds an access-list profile to an IP interface

icmp redirect accept

icmp redirect accept

Function

Accept ICMP redirect messages

Syntax Description

Option	Description
redirect	Host route redirects
accept	Accept ICMP redirect messages

Default

Disabled

Mode

Interface

Command Usage

Dependent on the network architecture, it's possible that a router resends a packet through the same interface on which it was received. If this happens, there is a more direct path for the packet's originator for reaching the destination device. The router now can send an icmp redirect message to the sender, which instructs it to remove the receiving device from the route table and substitute it by the entry available in the redirect message.
This command is used to permit the SmartWare to modify route entries based on a received icmp redirect message.

Example

The following examples allows the router to accept icmp redirect messages:

```
SN(cfg)#context ip
SN(ctx-ip)[router]#interface eth0
SN(if-ip)[eth0]#icmp redirect accept
```

Related Commands

Command	Description
icmp redirect send	Allows the router to send icmp redirect messages
show ip interface	Displays interface configuration and state

icmp redirect send

[no] icmp redirect send

Function

Send ICMP redirect messages

Syntax Description

Option	Description
redirect	Host route redirects
send	Send ICMP redirect messages

Default

Enabled

Mode

Interface

Command Usage

Dependent on the network architecture, it's possible that a router resends a packet through the same interface on which it was received. If this happens, there is a more direct path for the packet's originator for reaching the destination device. The router now can send an icmp redirect message to the sender, which instructs it to remove the receiving device from the route table and substitute it by the entry available in the redirect message.

Example

The following examples configures the router for sending icmp redirect messages:

```
SN(cfg)#context ip
SN(ctx-ip)[router]#interface eth0
SN(if-ip)[eth0]#icmp redirect send
```

Related Commands

Command	Description
icmp redirect accept	Allows the router to accept icmp redirect messages
show ip interface	Displays interface configuration and state

icmp router-discovery

icmp router-discovery

Function

Enable or disable router advertisement broadcasts

Syntax Description

Option	Description
This command has no keywords or options	

Default

Enabled

Mode

Interface

Command Usage

The ICMP Router Discovery Protocol uses Router-Advertisement and Router-Solicitation messages to discover the addresses of routers on directly attached subnets. By default, this feature is enabled, so ICMP router advertisement messages are sent either as a reply of an ICMP router solicitation message or periodically.

Example

The following example disables the ICMP Router Discovery protocol fot the interface eth0:

```
SN(cfg)#context ip
SN(ctx-ip)[router]#interface eth0
SN(if-ip)[eth0]#no icmp router-discovery
```

Related Commands

Command	Description
show ip interface	Displays interface configuration and state

interface

[no] interface <*name*>

Function

Enter interface configuration mode

Syntax Description

Option	Description
<*name*>	Name of the IP interface

Default

None

Mode

Context IP

Command Usage

If the interface with the specified name doesn't exist, a new interface will be created. This command creates only a logical interface, so it has no connection to a physical circuit. For enabling ip processing on this interface, an active link layer circuit must be bound to this interface.

If the interface already exists, the command enters the configuration mode of the specified interface.

The **no** prefix removes an existing interface. An interface can only be removed, if it has no active binding.

Example

The following example creates a new interface under the name 'eth0' and enters the interface configuration mode:

```
SN(ctx-ip)#interface eth0
SN(if-ip)[eth0]#
```

The following example removes the interface with the name 'eth0' and enters Context Ip configuration mode:

```
SN(if-ip)[eth0]#no interface eth0
SN(ctx-ip)
```

Related Commands

Command	Description
context ip [router]	Enters IP context
show ip interface	Displays interface configuration and state

ipaddress	Configures or changes the ipaddress of an interface

ipaddress

ipaddress { unnumbered | (*<ip_address> <ip_mask>* **) }**

Function

Set the IP address and netmask of the interface

Syntax Description

Option	Description
unnumbered	Enables ip processsing on an interface without assigning an explicit ip address to the interface.
<ip_address>	Specifies the ip address of the interface in the form A.B.C.D
<ip_mask>	Specifies the netmask of the interface

Default

None

Mode

Interface

Command Usage

For enabling ip processing on an interface, it uses a valid host interface configuration. That means every active ip interface connected to a network segment must belong to a unique subnet. The command checks, if the parameters entered by the user meet this requirements.

Entering an ip address and a netmask if the interface needs its own ip address and has to be connected to a specified subnet.

If the interface is configured as point-to-point where only one remote peer is available, it maybe doesn’t make sense to configure a subnet containing address spaces can be used for other interfaces. In this case, there is the possibility to configure the interface as unnumbered link, which uses the ip address of the first interface gets a valid host interface address. An interface configured as unnumbered is not visible in the routing table if the command **show ip route** will be executed. But the router has knowledge about this interface and so it’s possible to configure a static route using this interface.

Example

The following example enters interface configuration mode and configures a valid ip address and netmask for a B-Class subnet:

```
SN(ctx-ip)#interface pvc100
SN(if-ip)[pvc100]#ipaddress 172.16.8.88 255.255.0.0
```

The following example configures the interface as point-to-point unnumbered link and sets a static route to the remote peer:

```
SN(if-ip)[pvc100]#point-to-point
SN(if-ip)[pvc100]#ipaddress unnumbered
SN(if-ip)[pvc100]#exit
SN(ctx-ip)#route 172.17.50.10 255.255.255.255 pvc100
```

Related Commands

Command	Description
point-to-point	Configures interface as point to point link
route	Adds a new static route to the routing table
show ip route	Dispalys the routing table

mtu

mtu <*mtu*>

Function

Define the maximum transmission unit (MTU) for IP Packets sent on that interface

Syntax Description

Option	**Description**
<*mtu*>	Maximum IP Transmission Unit in bytes. The range is 68 thrgouth 1500 Byte

Default

The MTU is set to 1500 bytes by default.

Mode

Interface

Command Usage

If an Ip Packet exceeds the MTU configured on that interface, the router will fragment that packet.

Example

The following example configures a new MTU for an existing interface:

```
SN(ctx-ip)#interface test
SN(if-ip)[test]#mtu 812
```

Related Commands

Command	**Description**
show ip interface	Displays interface configuration and state

point-to-point

point-to-point

Function

Configure the interface as point-to-point link

Syntax Description

Option	Description
This command has no keywords or options	

Default

By default an interface is not configured as point-to-point link.

Mode

Interface

Command Usage

Configure point-to-point on every interface, which has only one remote peer on its data link. If point-to-point will be disabled by the **no** prefix, nothing will be printed out in the running configuration.

Example

The following example configures an interface as point-to-point link that will be bound to a framerelay pvc:

```
SN(ctx-ip)#interface pvc100
SN(if-ip)[pvc100]#point-to-point
```

Related Commands

None

rip announce

rip announce { default | self-as-default }

Function

Configures RIP default-route announcing

Syntax Description

Option	Description
default	Enables or disables announcing the RIP default route out the current interface
self-as-default	Enables or disables that the current interface's IP address is announced as default gateway

Default

The IP interface does not send default routes if not configured.

Mode

Interface

Command Usage

This command configures whether or not the interface sends a default route in RIP messages. When setting the parameter to **default**, the interface sends the default route in the routing table out this interface. When setting this parameter to **self-as-default**, the interface sends its own IP interface address as default route destination. Both parameters cannot be set at the same time.

Example

The following enables RIP on the interface eth1 and sends the default route of the router:

```
SN(cfg)#context ip
SN(ctx-ip)[router]#interface eth1
SN(if-ip)[eth1]#rip supply
SN(if-ip)[eth1]#rip announce default
```

The next example enables RIP on the interface eth1 and sends the own interface's IP address as default route destination:

```
SN(cfg)#context ip
SN(ctx-ip)[router]#interface eth1
SN(if-ip)[eth1]#rip supply
SN(if-ip)[eth1]#rip announce self-as-default
```

Related Commands

Command	Description

rip announce	Enable RIP announcing
rip announce host	Enable RIP announce IP host routes
rip announce static	Enable RIP announce static IP routes
rip auto-summary	Enable RIP auto summarization
rip default-route-value	Set the RIP default route metric
rip learn default	Enable RIP learning using default route advertised by a RIP neighbor
rip learn host	Enable accepting of received IP host routes
rip listen	Enable receive RIP on an interface
rip poison-reverse	Enable the poison reverse algorithm
rip receive version	Select the receive RIP version on an interface
rip route-holddown	Enable holding down aged routes on an interface
rip send version	Select the send RIP version on an interface
rip split-horizon	Enable RIP split-horizon processing on an interface
rip supply	Enable send RIP on an interface

rip announce host

rip announce host

Function

Enable RIP announce IP host routes

Syntax Description

Option	Description
This command has no keywords or options	

Default

The IP interface does not send host routes if not configured.

Mode

Interface

Command Usage

This command enables the transmission of IP host routes in RIP messages sent from this interface. The **no** form disables the transmission of IP host routes in RIP messages.

Example

The following example enables the transmission of RIP host routes on the IP interface eth1:

```
SN(cfg)#context ip
SN(ctx-ip)[router]#interface eth1
SN(if-ip)[eth1]#rip announce host
```

The next example disables the transmission of RIP host routes on the IP interface eth1:

```
SN(cfg)#context ip
SN(ctx-ip)[router]#interface eth1
SN(if-ip)[eth1]#no rip announce host
```

Related Commands

Command	Description
rip announce	Enable RIP announcing
rip announce host	Enable RIP announce IP host routes
rip announce static	Enable RIP announce static IP routes
rip auto-summary	Enable RIP auto summarization
rip default-route-value	Set the RIP default route metric
rip learn default	Enable RIP learning using default route advertised by a RIP neighbor

rip learn host	Enable accepting of received IP host routes
rip listen	Enable receive RIP on an interface
rip poison-reverse	Enable the poison reverse algorithm
rip receive version	Select the receive RIP version on an interface
rip route-holddown	Enable holding down aged routes on an interface
rip send version	Select the send RIP version on an interface
rip split-horizon	Enable RIP split-horizon processing on an interface
rip supply	Enable send RIP on an interface

rip announce static

rip announce static

Function

Enable RIP announce static IP routes

Syntax Description

Option	Description
This command has no keywords or options	

Default

The IP interface does not send default routes if not configured.

Mode

Interface

Command Usage

This command enables the transmission of static IP routes in RIP messages sent from this interface. The **no** form disables the transmission of static IP routes in RIP messages.

Example

The following example enables the transmission of RIP static routes on the IP interface eth1:

```
SN(cfg)#context ip
SN(ctx-ip)[router]#interface eth1
SN(if-ip)[eth1]#rip announce static
```

The next example disables the transmission of RIP static routes on the IP interface eth1:

```
SN(cfg)#context ip
SN(ctx-ip)[router]#interface eth1
SN(if-ip)[eth1]#no rip announce static
```

Related Commands

Command	Description
rip announce	Enable RIP announcing
rip announce host	Enable RIP announce IP host routes
rip announce static	Enable RIP announce static IP routes
rip auto-summary	Enable RIP auto summarization
rip default-route-value	Set the RIP default route metric
rip learn default	Enable RIP learning using default route advertised by a RIP neighbor

rip learn host	Enable accepting of received IP host routes
rip listen	Enable receive RIP on an interface
rip poison-reverse	Enable the poison reverse algorithm
rip receive version	Select the receive RIP version on an interface
rip route-holddown	Enable holding down aged routes on an interface
rip send version	Select the send RIP version on an interface
rip split-horizon	Enable RIP split-horizon processing on an interface
rip supply	Enable send RIP on an interface

rip auto-summary

rip auto-summary

Function

Enable RIP auto summarization

Syntax Description

Option	Description
This command has no keywords or options	

Default

Auto-summarization is off per default.

Mode

Interface

Command Usage

Enables the generation of route summaries in RIP responses sent out the current IP interface. Route summarization consists of announcing only the parent network address of IP subnets to other IP networks.

Example

The following example enables RIP route summarization on the IP interface eth1:

```
SN(cfg)#context ip
SN(ctx-ip)[router]#interface eth1
SN(if-ip)[eth1]#rip auto-summary
```

The next example disables RIP route summarization on the IP interface eth1:

```
SN(cfg)#context ip
SN(ctx-ip)[router]#interface eth1
SN(if-ip)[eth1]#no rip auto-summary
```

Related Commands

Command	Description
rip announce	Enable RIP announcing
rip announce host	Enable RIP announce IP host routes
rip announce static	Enable RIP announce static IP routes
rip auto-summary	Enable RIP auto summarization
rip default-route-value	Set the RIP default route metric

rip learn default	Enable RIP learning using default route advertised by a RIP neighbor
rip learn host	Enable accepting of received IP host routes
rip listen	Enable receive RIP on an interface
rip poison-reverse	Enable the poison reverse algorithm
rip receive version	Select the receive RIP version on an interface
rip route-holddown	Enable holding down aged routes on an interface
rip send version	Select the send RIP version on an interface
rip split-horizon	Enable RIP split-horizon processing on an interface
rip supply	Enable send RIP on an interface

rip default-route-value

rip default-route-value <*metric*>

Function

Set the RIP default route metric

Syntax Description

Option	Description
<*metric*>	Number indicating the distance to the destination for default routes.

Default

No metric is specified, which lets RIP send the metric 0 for default routes.

Mode

Interface

Command Usage

This command is used to specify a metric that is used to send default routes with.

Example

The following example enables RIP default route metric overriding on the IP interface eth1:

```
SN(cfg)#context ip
SN(ctx-ip)[router]#interface eth1
SN(if-ip)[eth1]#rip default-route-value 5
```

The next example disables RIP default route metric overriding on the IP interface eth1:

```
SN(cfg)#context ip
SN(ctx-ip)[router]#interface eth1
SN(if-ip)[eth1]#no rip default-route-value
```

Related Commands

Command	Description
rip announce	Enable RIP announcing
rip announce host	Enable RIP announce IP host routes
rip announce static	Enable RIP announce static IP routes
rip auto-summary	Enable RIP auto summarization
rip default-route-value	Set the RIP default route metric
rip learn default	Enable RIP learning using default route advertised by a RIP neighbor
rip learn host	Enable accepting of received IP host routes

rip listen	Enable receive RIP on an interface
rip poison-reverse	Enable the poison reverse algorithm
rip receive version	Select the receive RIP version on an interface
rip route-holddown	Enable holding down aged routes on an interface
rip send version	Select the send RIP version on an interface
rip split-horizon	Enable RIP split-horizon processing on an interface
rip supply	Enable send RIP on an interface

rip learn default

[no] rip learn default

Function

Enable RIP learning using default route advertised by a RIP neighbor

Syntax Description

Option	Description
This command has no keywords or options	

Default

The IP interface does not learn default routes if not configured.

Mode

Interface

Command Usage

Enables the learning and using a default route advertised by a RIP neighbour. The **no** form disables the learning of default routes.

Example

The following example enables the reception of RIP default routes on the IP interface eth1:

```
SN(cfg)#context ip
SN(ctx-ip)[router]#interface eth1
SN(if-ip)[eth1]#rip learn default
```

The next example disables the reception of RIP default routes on the IP interface eth1:

```
SN(cfg)#context ip
SN(ctx-ip)[router]#interface eth1
SN(if-ip)[eth1]#no rip learn default
```

Related Commands

Command	Description
rip announce	Enable RIP announcing
rip announce host	Enable RIP announce IP host routes
rip announce static	Enable RIP announce static IP routes
rip auto-summary	Enable RIP auto summarization
rip default-route-value	Set the RIP default route metric
rip learn default	Enable RIP learning using default route advertised by a RIP neighbor

rip learn host	Enable accepting of received IP host routes
rip listen	Enable receive RIP on an interface
rip poison-reverse	Enable the poison reverse algorithm
rip receive version	Select the receive RIP version on an interface
rip route-holddown	Enable holding down aged routes on an interface
rip send version	Select the send RIP version on an interface
rip split-horizon	Enable RIP split-horizon processing on an interface
rip supply	Enable send RIP on an interface

rip learn host

[no] rip learn host

Function

Enable accepting of received IP host routes

Syntax Description

Option	Description
This command has no keywords or options	

Default

The IP interface does not learn host routes if not configured.

Mode

Interface

Command Usage

Enables the learning and using a host route advertised by a RIP neighbour. The **no** form disables the learning of host routes.

Example

The following example enables the reception of RIP host routes on the IP interface eth1:

```
SN(cfg)#context ip
SN(ctx-ip)[router]#interface eth1
SN(if-ip)[eth1]#rip learn host
```

The next example disables the reception of RIP host routes on the IP interface eth1:

```
SN(cfg)#context ip
SN(ctx-ip)[router]#interface eth1
SN(if-ip)[eth1]#no rip learn host
```

Related Commands

Command	Description
rip announce	Enable RIP announcing
rip announce host	Enable RIP announce IP host routes
rip announce static	Enable RIP announce static IP routes
rip auto-summary	Enable RIP auto summarization
rip default-route-value	Set the RIP default route metric
rip learn default	Enable RIP learning using default route advertised by a RIP neighbor

rip learn host	Enable accepting of received IP host routes
rip listen	Enable receive RIP on an interface
rip poison-reverse	Enable the poison reverse algorithm
rip receive version	Select the receive RIP version on an interface
rip route-holddown	Enable holding down aged routes on an interface
rip send version	Select the send RIP version on an interface
rip split-horizon	Enable RIP split-horizon processing on an interface
rip supply	Enable send RIP on an interface

rip listen

[no] rip listen

Function

Enable receive RIP on an interface

Syntax Description

Option	Description
This command has no keywords or options	

Default

The IP interface does not receives RIP messages if not configured.

Mode

Interface

Command Usage

This command enables the reception of RIP messages on the current interface. All RIP learn subcommands have no effect before listening is not enabled.
The **no** form disables the reception of RIP messages on the current interface.

Example

The following example enables the reception of RIP messages on the IP interface eth1:

```
SN(cfg)#context ip
SN(ctx-ip)[router]#interface eth1
SN(if-ip)[eth1]#rip listen
```

The next example disables the reception of RIP messages no the IP interface eth1:

```
SN(cfg)#context ip
SN(ctx-ip)[router]#interface eth1
SN(if-ip)[eth1]#no rip listen
```

Related Commands

Command	Description
rip announce	Enable RIP announcing
rip announce host	Enable RIP announce IP host routes
rip announce static	Enable RIP announce static IP routes
rip auto-summary	Enable RIP auto summarization
rip default-route-value	Set the RIP default route metric

rip learn default	Enable RIP learning using default route advertised by a RIP neighbor
rip learn host	Enable accepting of received IP host routes
rip listen	Enable receive RIP on an interface
rip poison-reverse	Enable the poison reverse algorithm
rip receive version	Select the receive RIP version on an interface
rip route-holddown	Enable holding down aged routes on an interface
rip send version	Select the send RIP version on an interface
rip split-horizon	Enable RIP split-horizon processing on an interface
rip supply	Enable send RIP on an interface

rip poison-reverse

[no] rip poison-reverse

Function

Enable the poison reverse algorithm

Syntax Description

Option	Description
This command has no keywords or options	

Default

The poison-reverse algorithm is off per default.

Mode

Interface

Command Usage

This command enables the use of the poison reverse algorithm to RIP routes being advertised on the current IP interface. When enabling the split horizon algorithm on the current interface, the interface does not send out learned entries onto the network or to the neighbour to which they were learned. When additionally enabling poison-reverse, that entries are sent with a metric of 16, which is infinite.

Example

The following example shows how to enable split-horizon with poison-reverse on the IP interface eth1:

```
SN(cfg)#context ip
SN(ctx-ip)[router]#interface eth1
SN(if-ip)[eth1]#rip split-horizon
SN(if-ip)[eth1]#rip poison-reverse
```

Related Commands

Command	Description
rip announce	Enable RIP announcing
rip announce host	Enable RIP announce IP host routes
rip announce static	Enable RIP announce static IP routes
rip auto-summary	Enable RIP auto summarization
rip default-route-value	Set the RIP default route metric
rip learn default	Enable RIP learning using default route advertised by a RIP neighbor
rip learn host	Enable accepting of received IP host routes

rip listen	Enable receive RIP on an interface
rip poison-reverse	Enable the poison reverse algorithm
rip receive version	Select the receive RIP version on an interface
rip route-holddown	Enable holding down aged routes on an interface
rip send version	Select the send RIP version on an interface
rip split-horizon	Enable RIP split-horizon processing on an interface
rip supply	Enable send RIP on an interface

rip receive version

rip receive version { 1 | 2 | 1or2 }

Function

Select the receive RIP version on an interface

Syntax Description

Option	Description
1	Accept RIP version 1 packets on the current interface
2	Accept RIP version 2 packets on the current interface
1or2	Accept RIP version 1 or 2 packets on the current interface

Default

The default setting is to accept version 1 or 2 packets on the current interface.

Mode

Interface

Command Usage

Use this command to specify RIP packets of which protocol version shall be accepted on the current interface. RIP v1 is a simple distance vector protocol. It has been enhanced with Split Horizon and Poison Reverse in order to enable it to perform better in somewhat complicated networks. RIP v2 adds several new features like authentication and multicast support.

Example

The following example shows how to enable receving only RIP v1 packets on the IP interface eth0:

```
SN(cfg)#context ip
SN(ctx-ip)[router]#interface eth1
SN(if-ip)[eth1]#rip listen
SN(if-ip)[eth1]#rip receive version 1
```

The next example resets the RIP receive processor to the default setting. RIP v1 and v2 packets are received by the interface.

```
SN(if-ip)[eth1]#rip receive version 1or2
```

Related Commands

Command	Description
rip announce	Enable RIP announcing
rip announce host	Enable RIP announce IP host routes
rip announce static	Enable RIP announce static IP routes

rip auto-summary	Enable RIP auto summarization
rip default-route-value	Set the RIP default route metric
rip learn default	Enable RIP learning using default route advertised by a RIP neighbor
rip learn host	Enable accepting of received IP host routes
rip listen	Enable receive RIP on an interface
rip poison-reverse	Enable the poison reverse algorithm
rip receive version	Select the receive RIP version on an interface
rip route-holddown	Enable holding down aged routes on an interface
rip send version	Select the send RIP version on an interface
rip split-horizon	Enable RIP split-horizon processing on an interface
rip supply	Enable send RIP on an interface

rip route-holddown

[no] rip route-holddown

Function

Enable holding down aged routes on an interface

Syntax Description

Option	Description
This command has no keywords or options	

Default

None

Mode

Interface

Command Usage

Enables holding down (i.e. locking) aged routes learned from RIP messages on the current IP interface. Thus an aged route cannot be refreshed to a non-aged status but must instead be deleted and then relearned, thus enhancing the stability of the RIP topology in the presence of transients. The **no** form disables holding down aged routes.

Example

The following examples enables route-holddown on the IP interface eth1:

```
SN(cfg)#context ip
SN(ctx-ip)[router]#interface eth1
SN(if-ip)[eth1]#rip route-holddown
```

Related Commands

Command	Description
rip announce	Enable RIP announcing
rip announce host	Enable RIP announce IP host routes
rip announce static	Enable RIP announce static IP routes
rip auto-summary	Enable RIP auto summarization
rip default-route-value	Set the RIP default route metric
rip learn default	Enable RIP learning using default route advertised by a RIP neighbor
rip learn host	Enable accepting of received IP host routes
rip listen	Enable receive RIP on an interface
rip poison-reverse	Enable the poison reverse algorithm

rip receive version	Select the receive RIP version on an interface
rip route-holddown	Enable holding down aged routes on an interface
rip send version	Select the send RIP version on an interface
rip split-horizon	Enable RIP split-horizon processing on an interface
rip supply	Enable send RIP on an interface

rip send version

rip send version { 1 | 2 | 1compatible }

Function

Select the send RIP version on an interface

Syntax Description

Option	Description
1	Send RIP version 1 packets on the current interface
2	Send RIP version 2 packets on the current interface
1compatible	Send RIP version 1 compatible on the current interface

Default

The interface sends version 1 compatible RIP messages on the current interface if not configured differently.

Mode

Interface

Command Usage

This command configures the RIP version of packets that are sent out the current IP interface. Version 1 only sends RIP v1 messages. Version 2 sends multicast RIP v2 messages. Version 1 compatible sends broadcast RIP v2 messages.

Example

The following example shows how to send only RIP v1 messages out the IP interface eth1:

```
SN(cfg)#context ip
SN(ctx-ip)[router]#interface eth1
SN(if-ip)[eth1]#rip send version 1
```

Related Commands

Command	Description
rip announce	Enable RIP announcing
rip announce host	Enable RIP announce IP host routes
rip announce static	Enable RIP announce static IP routes
rip auto-summary	Enable RIP auto summarization
rip default-route-value	Set the RIP default route metric
rip learn default	Enable RIP learning using default route advertised by a RIP neighbor
rip learn host	Enable accepting of received IP host routes

rip listen	Enable receive RIP on an interface
rip poison-reverse	Enable the poison reverse algorithm
rip receive version	Select the receive RIP version on an interface
rip route-holddown	Enable holding down aged routes on an interface
rip send version	Select the send RIP version on an interface
rip split-horizon	Enable RIP split-horizon processing on an interface
rip supply	Enable send RIP on an interface

rip split-horizon

[no] rip split-horizon

Function

Enable RIP split-horizon processing on an interface

Syntax Description

Option	Description
This command has no keywords or options	

Default

None

Mode

Interface

Command Usage

This command enables the use of the split horizon algorithm to RIP routes being advertised on the current IP interface. When enabling the split horizon algorithm on the current interface, the interface does not send out learned entries onto the network or to the neighbour to which they were learned. When additionally enabling poison-reverse, that entries are sent with a metric of 16, which is infinite.

Example

The following example shows how to enable split-horizon with poison-reverse on the IP interface eth1:

```
SN(cfg)#context ip
SN(ctx-ip)[router]#interface eth1
SN(if-ip)[eth1]#rip split-horizon
SN(if-ip)[eth1]#rip poison-reverse
```

Related Commands

Command	Description
rip announce	Enable RIP announcing
rip announce host	Enable RIP announce IP host routes
rip announce static	Enable RIP announce static IP routes
rip auto-summary	Enable RIP auto summarization
rip default-route-value	Set the RIP default route metric
rip learn default	Enable RIP learning using default route advertised by a RIP neighbor
rip learn host	Enable accepting of received IP host routes

rip listen	Enable receive RIP on an interface
rip poison-reverse	Enable the poison reverse algorithm
rip receive version	Select the receive RIP version on an interface
rip route-holddown	Enable holding down aged routes on an interface
rip send version	Select the send RIP version on an interface
rip split-horizon	Enable RIP split-horizon processing on an interface
rip supply	Enable send RIP on an interface

rip supply

[no] rip supply

Function

Enable send RIP on an interface

Syntax Description

Option	Description
This command has no keywords or options	

Default

The IP interface does not send RIP messages if not configured.

Mode

Interface

Command Usage

This command enables the transmission of RIP messages on the current interface. All RIP announce sub-commands have no effect before supplying is not enabled.
The **no** form disables the transmission of RIP messages on the current interface.

Example

The following example enables the transmission of RIP messages on the IP interface eth1:

```
SN(cfg)#context ip
SN(ctx-ip)[router]#interface eth1
SN(if-ip)[eth1]#rip supply
```

The next example disables the transmission of RIP messages no the IP interface eth1:

```
SN(cfg)#context ip
SN(ctx-ip)[router]#interface eth1
SN(if-ip)[eth1]#no rip supply
```

Related Commands

Command	Description
rip announce	Enable RIP announcing
rip announce host	Enable RIP announce IP host routes
rip announce static	Enable RIP announce static IP routes
rip auto-summary	Enable RIP auto summarization
rip default-route-value	Set the RIP default route metric

rip learn default	Enable RIP learning using default route advertised by a RIP neighbor
rip learn host	Enable accepting of received IP host routes
rip listen	Enable receive RIP on an interface
rip poison-reverse	Enable the poison reverse algorithm
rip receive version	Select the receive RIP version on an interface
rip route-holddown	Enable holding down aged routes on an interface
rip send version	Select the send RIP version on an interface
rip split-horizon	Enable RIP split-horizon processing on an interface
rip supply	Enable send RIP on an interface

use profile acl

[**no**] **use profile acl** <*name*> { **in** | **out** }

Function

Apply a packet filter to an interface

Syntax Description

Option	**Description**
profile	Applies a profile to this interface
acl	Applies a packet filter to this interface
<*name*>	The name of an access-list profile that has already been created using the **profile acl** command. This argument must be omitted in the **no** form.
in	Specifies that the access-list profile applies to incoming packets on this interface.
out	Specifies that the access-list profile applies to outgoing packets on this interface.

Default

None

Mode

Interface

Command Usage

Binds an access-list profile to an IP interface.
Use the **no** form of this command to remove an access-list profile from an IP interface.

Example

Apply an access-list profile to incoming packets on interface eth0 in the router context.

```
SN(cfg)#context ip router
SN(cfg-ip)[router]#interface eth0
SN(cfg-if)[eth0]#use profile acl WanRx in
SN(cfg-if)[eth0]#
```

Remove an access-list profile from an interface. Please note that the no form does not require the <*name*> argument.

```
SN(cfg-if)[eth0]#no use profile acl in
```

Related Commands

Command	Description
profile acl	Creates an IP access-list profile

use profile napt

[no] use profile napt <*name*>

Function

Apply a NAPT profile to an interface

Syntax Description

Option	**Description**
<*name*>	Name of the NAPT profile to apply.

Default

No NAPT profile is applied per default.

Mode

Interface

Command Usage

This command is used to apply a NAPT profile to the current IP interface. Once applied, the IP interface is the global NAPT interface and all other interfaces are local NAPT interfaces. Thus only one NAPT profile can be applied to only one interface.

Example

The following example applies the NAPT profile “global” to the IP interface eth0, which gets the global interface:

```
SN(cfg)#context ip
SN(ctx-ip)[router]#interface eth1
SN(if-ip)[eth1]#use profile napt global
```

Related Commands

Command	**Description**
profile napt	Creates/Configures a NAPT profile
show profile napt	Displays a NAPT profile
show interface napt	Displays the NAPT profile usage of an interface

use profile service-policy

[no] use profile service-policy <*arbiter-name*> **{ in | out }**

Function

Apply a service policy to an interface

Syntax Description

Option	**Description**
profile service-policy	Applies a service policy profile to this interface
<*arbiter-name*>	Name of the profile
in	Receive direction
out	Transmit direction

Default

The default setting "no service-policy" sets the interface to FIFO queuing.

Mode

Interface

Command Usage

Any service policy profile needs to be bound to a certain IP interface to get activated. According the terminology of SmartWare a service policy profile is *used* on a certain IP interface. Therefore the **use profile service-policy** command allows attaching a certain service policy profile to an IP interface that is defined within the IP context. The command offers an optional argument allowing to define that the service policy profile is activated in receive or transmit direction.

Note: Be aware that service policy profiles can only be activated on the transmit direction at the moment!

Providers may use input shaping to improve downlink voice jitter in the absence of voice support.

Example

The following example shows how to attach the service policy profile *Voice_Prio* to the IP interface *wan* that is defined within the IP context for outgoing traffic.

```
SN>enable
SN#configure
SN(cfg)#context ip router
SN(ctx-ip)[router]#interface wan
SN(if-ip)[wan]#use profile service-policy Voice_Prio out
```

Related Commands

None

16 CONTEXT CS MODE

16.1 Command Overview

In this mode you may configure a node's Circuit Switching, creating, editing or deleting routing table entries. The CS context in SmartWare is a high level conceptual entity that is responsible for all aspects of circuit signalling, switching and emulation. The CS entity comprises the Context CS itself, CS Interfaces, ISDN Ports, Tone-Set Profiles, ISoIP and H.323 Gateways and VoIP Profiles. The context CS mode is used to configure call routing, create number manipulation functions, and defining other call related behavior. Calls through a SmartNode can be routed according to a set of routing criteria. The entity that manages call routing is called Session Router. Calls are routed from one CS interface to another. The Session Router determines the destination interface for every incoming call. It supports complex call routing and number manipulation functions.

The commands that are available in this mode are listed in Table 16-1 below:

Command	Description
bearer-capability	Add an entry to a bearer-capability routing table
called-party	Add an entry to a called party number routing table
calling-party	Create a function used witin a complex function
complex-function	Add an entry to a date routing table
context cs	Enter session-router configuration mode
date	Add an entry to a date routing table
delete	Delete a session router element
number-manipulation	Create an E.164 number manipulation function
number-prefix	Define a number prefix
shutdown	Shutdown circuit context and reload entire session-router configuration
time	Add an entry to a time routing table
translation-table	Add entry to number translation table
use tone-set-profile	Link to a tone profile
weekday	Add an entry to a weekday routing table

Table 16-1: Commands available in Context CS Mode

bearer-capability

[no] bearer-capability *<name>* **{audio31 | audio71 | rd | speech | ud | video | default } ({ ({ (dest-table** *<dest-name>* **) | (dest-interface** *<dest-name>* **) } [** *<func>* **]) | none })**

Function

Add an entry to a bearer-capability routing table

Syntax Description

Option	Description
<name>	Table name
audio31	Audio at 3.1 kHz
audio71	Audio at 7.1 kHz
rd	Restricted digital information
speech	Speech
ud	Unristricted digital information
video	Video
default	Default entry to be used, if no other key matches
dest-table	Use routing table as destination
<dest-name>	Table name
dest-interface	Use interface as destination
<dest-name>	Interface name
<func>	Function to be executed
none	Drop session

Default

None

Mode

Context CS

Command Usage

This command is used to add an entry to a bearer-capability routing table. If the table does not already exist, it will be created.

Example

The following example shows how to add an entry to a bearer-capability table named ‘rt’, which routes all speech calls to the voice interface ‘vif’ and executes function ‘func’ before jumping to the interface:

```
SN(ctx-cs)[switch]#bearer-capability rt speech dest-interface vif
func
```

The next example shows how to delete the entire routing table named rt:

```
    SN(ctx-cs)[switch]#no bearer-capability rt
```

Related Commands

Command	Description
called-party	Creates/adds called-party number routing tables/entries.
calling-party	Creates/adds calling-party number routing tables/entries.
date	Creates/adds date routing tables/entries.
time	Creates/adds time-of-day routing tables/entries.
weekday	Creates/adds day-of-week routing tables/entries.

called-party

[no] called-party *<name> <key>* **({ ({ (dest-table** *<dest-name>* **) | (dest-interface** *<dest-name>* **) } [** *<func>* **]) | none })**

Function

Add an entry to a called party number routing table

Syntax Description

Option	Description
<name>	Table name
<key>	Key of entry (E.164 number or 'default')
dest-table	Use routing table as destination
<dest-name>	Table name
dest-interface	Use interface as destination
<dest-name>	Interface name
<func>	Function to be executed
none	Drop session

Default

None

Mode

Context CS

Command Usage

This command is used to add an entry to a called-party routing table. If the table does not already exist, it will be created.

Example

The following example shows how to add an entry to a bearer-capability table named ‘rt1’, which routes all speech calls to the routing table ‘rt2’ and executes function ‘func1’ before jumping to the table:

```
SN(ctx-cs)[switch]#called-party rt1 dest-table rt2 func1
```

The next example shows how to delete the entire routing table named rt1:

```
SN(ctx-cs)[switch]#no called-party rt
```

Related Commands

Command	Description

bearer-capability Creates/bearer-capability number routing tables/entries.

calling-party Creates/adds calling-party number routing tables/entries.

date Creates/adds date routing tables/entries.

time Creates/adds time-of-day routing tables/entries.

weekday Creates/adds day-of-week routing tables/entries.

calling-party

[no] calling-party *<name> <key>* **({ ({ (dest-table** *<dest-name>* **) | (dest-interface** *<dest-name>* **) } [** *<func>* **]) | none })**

Function

Add an entry to a calling party number routing table

Syntax Description

Option	Description
<name>	Table name
<key>	Key of entry (E.164 number or 'default')
dest-table	Use routing table as destination
<dest-name>	Table name
dest-interface	Use interface as destination
<dest-name>	Interface name
<func>	Function to be executed
none	Drop session

Default

None

Mode

Context CS

Command Usage

This command is used to add an entry to a calling-party routing table. If the table does not already exist, it will be created.

Example

The following example shows how to add an entry to a calling-party table named ‘rt’, which routes all calls from subscriber 0319123432 to the voice interface ‘vif’ and executes function ‘func’ before jumping to the interface:

```
SN(ctx-cs)[switch]#calling-party rt 0319123432 dest-interface vif
func
```

The next example shows how to delete the entire routing table named rt:

```
SN(ctx-cs)[switch]#no calling-party rt
```

Related Commands

Command	Description

bearer-capability	Creates/adds bearer-capability number routing tables/entries.
called-party	Creates/adds called-party number routing tables/entries.
date	Creates/adds date routing tables/entries.
time	Creates/adds time-of-day routing tables/entries.
weekday	Creates/adds day-of-week routing tables/entries.

complex-function

[no] complex-function *<name>* *<param>*

Function

Create a function used witin a complex function

Syntax Description

Option	Description
<name>	Function name
<param>	Function to be called

Default

None

Mode

Context CS

Command Usage

Complex-functions are used, whenever a function in a routing table needs to do more than one single operation. For example, if the function should add digits to the called and calling party number. A complex-function is actually a list of normal session-router functions, which will be executed sequentially.

Example

The following example creates a complex function named comfunc, which executes func1, func2 and func3 sequentially:

```
SN(ctx-cs)[switch]#complex-function comfunc func1
SN(ctx-cs)[switch]#complex-function comfunc func2
SN(ctx-cs)[switch]#complex-function comfunc func3
```

The next example deletes the complex function comfunc

```
SN(ctx-cs)[switch]#complex-function comfunc
```

Related Commands

None

context cs

[no] context cs [*<name>* **]**

Function

Enter session-router configuration mode

Syntax Description

Option	**Description**
<name>	Name of the circuit context to enter

Default

None

Mode

Context CS

Command Usage

This command is used to enter the circuit context configuration mode. In this mode, all session-router configuration is done.

Example

The following example shows the usage:

```
SN(cfg)#context cs
SN(ctx-cs)[switch]#
```

Related Commands

Command	**Description**
context ip	Enter IP context configuration mode

date

[no] date *<name>* *<key>* **({ ({ (dest-table** *<dest-name>* **) | (dest-interface** *<dest-name>* **) } [** *<func>* **]) | none })**

Function

Add an entry to a date routing table

Syntax Description

Option	Description
<name>	Table name
<key>	Key of entry (YYYY/MM/DD-YYYY/MM/DD or 'default')
dest-table	Use routing table as destination
<dest-name>	Table name
dest-interface	Use interface as destination
<dest-name>	Interface name
<func>	Function to be executed
none	Drop session

Default

None

Mode

Context CS

Command Usage

This command is used to add an entry to a date routing table. If the table does not already exist, it will be created.

Example

The following example shows how to add an entry to a date table named 'rt1', which routes all calls from January 1. 2002 to April 30. 2002 to the routing table 'rt2' and executes function 'func1' before jumping to the table:

```
SN(ctx-cs)[switch]#date 2002/01/01-2002/04/30 dest-table rt2 func1
```

The next example shows how to delete the entire routing table named rt1:

```
SN(ctx-cs)[switch]#no date rt
```

Related Commands

Command	Description

bearer-capability Creates/adds bearer-capability number routing tables/entries.

calling-party Creates/adds calling-party routing tables/entries.

called-party Creates/adds called-party number routing tables/entries.

time Creates/adds time-of-day routing tables/entries.

weekday Creates/adds day-of-week routing tables/entries.

delete

delete { all | all-functions | all-routing-tables | all-translation-tables | all-interfaces }

Function

Delete a session router element

Syntax Description

Option	Description
all	Delete all sessionrouter elements
all-functions	Delete all functions
all-routing-tables	Delete all routing tables
all-translation-tables	Delete all replacement tables
all-interfaces	Delete all voice interfaces

Default

None

Mode

Context CS

Command Usage

These commands are used to delete all sessionrouter-elements of the indicated type.

Example

The following example deletes all session-router functions:

```
SN(ctx-cs)[switch]#delete all-functions
```

Related Commands

None

number-manipulation

[no] number-manipulation <*name*> **{ cdpn | cnpn } { (add <param>) | (remove** <*param*> **) | (replace** <*param*> **) | (truncate** <*param*> **) }**

Function

Create an E.164 number manipulation function

Syntax Description

Option	**Description**
<*name*>	Function name
cdpn	Modify the called party number
cnpn	Modify the calling party number
add	Add specified digits digits to the beginning of the number
<*param*>	Digits to add at the beginning of the number
remove	Remove specified number of digits from the beginning of the number
<*param*>	Number of digits to remove at the beginning of the number
replace	Replace the complete number
<*param*>	Name of the translation-table to use
truncate	Truncate number to specified number of digits
<*param*>	Remaining number of digits (Leading digits will be removed)

Default

None

Mode

Context CS

Command Usage

This command is used to create a session-router function, which modifies either the called- or calling-party numbers of the call.

Example

The following examples creates a function, which removes two digits from the beginning of the calling-party number.

```
SN(ctx-cs)[switch]#number-manipulation cnpn remove 2
```

The next example adds the prefix 123 to the called party number:

```
SN(ctx-cs)[switch]#number-manipulation cdpn add 123
```

The next example truncates the called party number to 3 digits:

```
SN(ctx-cs)[switch]#number-manipulation cdpn truncate 123
```

The next example replaces the called party number using the translation-table trtab1:

```
SN(ctx-cs)[switch]#number-manipulation cdpn replace trtab1
```

Related Commands

Command	Description
translation-table	Creates or adds entries to translation tables
complex-function	Builds functions, which consist of several sequential number-manipulation functions

number-prefix

[no] number-prefix { national | international } *<prefix>*

Function

Define a number prefix

Syntax Description

Option	Description
national	Define national number prefix
international	Define international number prefix
<prefix>	Prefix

Default

The default is not to use any prefixes for national and international numbers.

Mode

Context CS

Command Usage

The command defines the prefixes used for national- and international-numbers. Usually the national prefix is '0' while the international prefix is '00', however this may vary in some countries. These prefixes are used whenever a number of a specific type (national or international) needs to get converted into the unknown type or the reverse way.

Warning: If these settings are not configured properly, the session-router may not properly handle numbers of type national or international.

Example

The following examples defines the national prefix to 0 and the international prefix to 00:

```
SN(ctx-cs)[switch]#number-prefix national 0
SN(ctx-cs)[switch]#number-prefix national 00
```

Related Commands

Command	Description
convert-to-specific	Converts the number to a specific type (eg. National, international)
convert-to-unknown	Converts the number to unknown type
called-party	Builds called-party-number routing tables
calling-party	Builds calling-party-number routing tables

shutdown

[no] shutdown

Function

Shutdown circuit context and reload entire session-router configuration

Syntax Description

Option	**Description**
This command has no keywords or options	

Default

None

Mode

Context CS

Command Usage

The command is used to disable the session-router of the context cs, or to reload a modified session-router configuration.

The 'no shutdown' command activates the changes made to the session-router configuration. If the command returns an error, enabe the session-router monitor using 'debug session-router' and do the 'no shutdown' again. This will display valuable information about the session-router configuration problem.

Warning: If you make any changes to the session-router configuration, these changes will not be activated until you issue the 'no shutdown' command on the context cs.

Example

The following example shows how to activate a modified session-router configuration:

```
SN(ctx-cs)[switch]#no shutdown
```

The next example disables the session-router of the context cs, which causes all call-setup attempts to be rejected by the session-control :

```
SN(ctx-cs)[switch]#shutdown
```

Related Commands

Command	**Description**
debug session-router	Displays information about configuration problems, when issuing the 'no shutdown' command.

time

[no] time *<name> <key>* **({ ({ (dest-table** *<dest-name>* **) | (dest-interface** *<dest-name>* **) } [** *<func>* **]) | none })**

Function

Add an entry to a time routing table

Syntax Description

Option	Description
<name>	Table name
<key>	Key of entry (HH:MM-HH:MM) or 'default')
dest-table	Use routing table as destination
<dest-name>	Table name
dest-interface	Use interface as destination
<dest-name>	Interface name
<func>	Function to be executed
none	Drop session

Default

None

Mode

Context CS

Command Usage

This command is used to add an entry to a time routing table. If the table does not already exist, it will be created.

Example

The following example shows how to add an entry to a bearer-capability table named ‘rt’, which routes all calls from 10:00PM to 11:00PM to the voice interface ‘vif’ and executes function ‘func’ before jumping to the interface:

```
SN(ctx-cs)[switch]#time rt 22:00-23:00 dest-interface vif func
```

The next example shows how to delete the entire routing table named rt:

```
SN(ctx-cs)[switch]#no time rt
```

Related Commands

Command	Description

bearer-capability Creates/adds bearer-capability number routing tables/entries.

calling-party Creates/adds calling-party routing tables/entries.

called-party Creates/adds called-party number routing tables/entries.

date Creates/adds date routing tables/entries.

weekday Creates/adds day-of-week routing tables/entries.

translation-table

[no] translation-table <*name*> <*num_in*> <*num_out*>

Function

Add entry to number translation table

Syntax Description

Option	Description
<*name*>	translation table name
<*num_in*>	Number to be replaced
<*num_out*>	Replacement number

Default

None

Mode

Context CS

Command Usage

Adds an entry to a number translation table. If the table does not exist, it will be created.

Example

The following example adds an entry to the translation table trtab1, which replaces the number 123 with number 456 :

```
SN(ctx-cs)[switch]#translation-table trtab1 123 456
```

The next example deletes the translation-table trtab1:

```
SN(ctx-cs)[switch]#no translation-table trtab1
```

Related Commands

Command	Description
number-manipulation	Manipulates E.164 numbers using translation-tables

use tone-set-profile

[no] use tone-set-profile <*name*>

Function

Link to a tone profile

Syntax Description

Option	Description
<*name*>	Name of the tone-set

Default

The context cs is linked to the tone-set-profile ‘default’.

Mode

Context CS

Command Usage

Defines the default tone-set profile that is used for tone playback. This setting can be overridden by the settings in the interface PSTN, H.323 or ISoIP modes.

Example

The following example makes the tone-set profile named *toneSetD* being used as default for tone playback, if no other configuration overrides it.

```
SN(ctx-cs)[switch]#use tone-set-profile toneSetD
```

Related Commands

Command	Description
profile tone-set	Enter profile tone set configuration mode
show profile tone-set	Display ton set information

weekday

[no] weekday *<name>* **{ sun | mon | tue | wed | thu | fri | sat | default } ({ ({ (dest-table** *<dest-name>* **) | (dest-interface** *<dest-name>* **) } [** *<func>* **]) | none })**

Function

Add an entry to a weekday routing table

Syntax Description

Option	Description
<name>	Table name
sun	Sunday
mon	Monday
tue	Tuesday
wed	Wednesday
thu	Thursday
fri	Friday
sat	Saturday
default	Wildcard
dest-table	Use routing table as destination
<dest-name>	Table name
dest-interface	Use interface as destination
<dest-name>	Interface name
<func>	Function to be executed
none	Drop session

Default

None

Mode

Context CS

Command Usage

This command is used to add an entry to a weekday routing table. If the table does not already exist, it will be created.

Example

The following example shows how to add an entry to a weekday table named ‘rt’, which routes all calls on mondays to the voice interface ‘vif’ and executes function ‘func’ before jumping to the interface:

```
SN(ctx-cs)[switch]#weekday rt mon dest-interface vif func
```

The next example shows how to delete the entire routing table named rt:

```
SN(ctx-cs)[switch]#no weekday rt
```

Related Commands

Command	Description
bearer-capability	Creates/adds bearer-capability number routing tables/entries.
calling-party	Creates/adds calling-party routing tables/entries.
called-party	Creates/adds called-party number routing tables/entries.
date	Creates/adds date routing tables/entries.
time	Creates/adds time-of-day routing tables/entries.

17 INTERFACE PSTN MODE

17.1 Command Overview

In this mode you may configure a SmartNode's PSTN interface parameters. Within the CS context of SmartWare, a PSTN interface (ISDN and POTS) is a logical entity providing call routing for incoming and outgoing calls to and from ISDN or POTS ports and voice over IP gateways. Configuring port bindings, digit collection, fallback routing tables, destination routing tables, and use of a tone profile on an interface is done within the interface PSTN mode.

The commands that are available in this mode are listed in Table 17-1 below:

Command	Description
bind port	Add or remove a physical port to or from a PSTN interface
digit-collection	Defines delayed dialing
fallback	Define the fallback routing element for the interface
interface pstn	Enter PSTN interface configuration mode
routing	Define the routing element for the interface
use tone-set-profile	Link a tone-set profile to this interface

Table 17-1: Commands available in Interface PSTN Mode

bind port

[no] bind port *<slot> <port>*

Function

Add or remove a physical port to or from a PSTN interface

Syntax Description

Option	Description
port	Add or remove a physical port to/from a PSTN interface
<slot>	Slot number
<port>	Port number

Default

None

Mode

Interface PSTN

Command Usage

The command is used to bind one or more physical PSTN ports to a logical PSTN session-router interface. The command can be used multiple times in the same PSTN interface to add multiple PSTN ports.

Example

The following example binds PSTN port 0 0 and 0 1 to the PSTN interface <*name*>:

```
SN(ctx-cs)[switch]#interface pstn <name>
SN(if-pstn)[<name>]#bind port 0 0
SN(if-pstn)[<name>]#bind port 0 1
```

The next example removes all bound ports from the PSTN interface <*name*>:

```
SN(if-pstn)[<name>]#no bind port
```

Related Commands

None

digit-collection

[no] digit-collection { (timeout [*<val>* **]) | (terminating-char** *<val>* **) | (nr-length** *<val>* **) }**

Function

Defines delayed dialing

Syntax Description

Option	**Description**
timeout	Dialing after a timeout
<val>	Timeout in seconds
terminating-char	Defines the dial termination character
<val>	Termination character
nr-length	Defines the minimum called-party number length
<val>	Minimum required number of digits

Default

None

Mode

Interface PSTN

Command Usage

The command causes initiation of calls originated from this voice interface to be deferred until the condition indicated in this command is met. There are three different conditions, which can be specified. These conditions all be used separately, or they can also be combined. This feature is used whenever a gatekeeper or PBX requires a minimum number of called-party number digits or even the complete called-party number in the setup message. This is usually the case for systems, which do not support overlapped-dialing.

The first condition is a timeout, which indicates how long the call initiation shall be deferred after the last called party number digit has been received.

The second condition is a termination-character, which indicates that the number is now complete and the setup message can be sent. Usually the '#' character is used for this purpose, however any other E.164 character can be used. If the timeout condition is also used, the reception of the terminating-character will cause the setup to be sent, before the timeout expired.

The third condition is a minimal required number length. The setup message will under no circumstances be sent if not at lest the indicated minimum number of called-party number digits are ready to be sent. If also a timeout is specified, this timeout will only be started, after the minimum number of called-party number digits are ready. Also, if a terminating-character is defined, it will not cause a number to be sent, which is shorter than the configured minimal number-length. It can only be used to stop a pending timeout, and send the setup immediately instead.

Example

The following example waits for at least 3 digits befor forwarding the call-setup message to the physical interface:

```
SN(if-pstn)[<name>]#digit-collection nr-length 3
```

The next example waits 3 seconds after the last called-party number digit has been received, or until the '#' character has been received, before sending the call-setup message:

```
SN(if-pstn)[<name>]#digit-collection timeout 3
SN(if-pstn)[<name>]#digit-collection terminating-char #
```

Related Commands

None

fallback

[no] fallback { (dest-table <*name*> **) | (dest-interface** <*name*> **) }**

Function

Define the fallback routing element for the interface

Syntax Description

Option	**Description**
dest-table	Use routing table as destination
<*name*>	Table name
dest-interface	Use interface as destination
<*name*>	Interface name

Default

None

Mode

Interface PSTN

Command Usage

Defines the fallback (secondary) destination to be used for calls incoming over this voice interface. The fallback destination will be used, if the call-setup over the primary destination indicated in the 'routing' command failed. You may either indicate a routing-table or a voice-interface, to which the call shall be routed to.

Example

The following example defines the voice interface 'voif' to be used as fallback destination:

```
SN(if-pstn)[<name>]#fallback dest-interface voif
```

The next example defines the routing table 'rtab' to be used as fallback destination:

```
SN(if-pstn)[<name>]#fallback dest-table rtab
```

Related Commands

Command	**Description**
routing	Defines the primary routing destination for calls incoming over this voice interface.

interface pstn

[no] interface pstn <*if-name*>

Function

Enter PSTN interface configuration mode

Syntax Description

Option	Description
pstn	Enter pstn interface configuration mode
<*if-name*>	Interface name

Default

None

Mode

Interface PSTN

Command Usage

Enters PSTN voice interface configuration mode. If the interface does not already exist, it will be created. The inverted form of the command will delete the PSTN voice interface.

Example

The following examples creates a PSTN interface named <*name*>:

```
SN(cfg)#context cs
SN(ctx-cs)[switch]#interface pstn <name>
```

The next example deletes the PSTN interface named <*name*>:

```
SN(ctx-cs)[switch]#no interface pstn <name>
```

Related Commands

Command	Description
interface h323	Creates a H.323 voice interface
interface isoip	Creates an IsoIP voice interface

routing

[no] routing { (dest-table <*name*> **) | (dest-interface** <*name*> **) }**

Function

Define the routing element for the interface

Syntax Description

Option	**Description**
dest-table	Use routing table as destination
<*name*>	Table name
dest-interface	Use interface as destination
<*name*>	Interface name

Default

None

Mode

Interface PSTN

Command Usage

The command is used to define the primary routing destination for the voice interface. The destination can either directly be another voice interface, or a routing table. All calls incoming on a voice interface will first be forwarded to the destination indicated in the 'routing' command. If the call-setup to this destination fails, the destination indicated in the 'fallback' command will be used.

Example

The following examples uses the voice interface 'vif' as the destination for all inbound calls:

```
SN(if-pstn)[<name>]#routing dest-interface vif
```

The next example uses the routing table 'rtab' as the destination for all inbound calls:

```
SN(if-pstn)[<name>]#routing dest-table rtab
```

Related Commands

Command	**Description**
fallback	Defines the fallback (secondary) destination for all inbound calls on this interface.

use tone-set-profile

[no] use tone-set-profile <*name*>

Function

Link a tone-set profile to this interface

Syntax Description

Option	Description
<*name*>	Name of the tone-set

Default

No linkage is defined. The tone-set linked to context CS is used as default.

Mode

Interface PSTN

Command Usage

A certain voice interface may be required to play tones that look different that the tones on other interfaces. This command defines that an own tone-set shall be used for all calls going through this interface. The setting here overrides the tone-set profile linked to the context CS.

Example

The following example defines that a special tone-set named ‘specialSetD’ shall be used on this interface:

```
SN(if-pstn)[<name>]#use tone-set-profile specialSetD
```

The next example unlinks any tone-set from the interface. The tone-set configured in context CS will be used further on.

```
SN(if-pstn)[<name>]#no use tone-set-profile
```

Related Commands

Command	Description
use tone-set profile	Link a tone-set profile to an interface
show profile tone-set	Display ton set information
profile tone-set	Enter profile tone set configuration mode

18 INTERFACE H.323 MODE

18.1 Command Overview

In this mode you may configure a SmartNode's H.323 interface parameters. Defining the H.323 gateway to which an H.323 interface gets bound, the audio codec that is used, the dejitter behavior and other settings for an H.323 interface is done using the interface H.323 mode.

The commands that are available in this mode are listed in Table 18-1 below:

Command	Description
bind gateway	Bind selected interface to a H.323 gateway
codec	Define the audio codec to be used on selected interface
dejitter-grow-attenuation	Set the dejitter grow attenuation parameter
dejitter-grow-step	Set the dejitter grow step parameter
dejitter-max-delay	Set the dejitter maximal delay
dejitter-max-packet-loss	Set the dejitter maximal packet loss
dejitter-mode	Set the dejitter mode used on selected interface
dejitter-shrink-speed	Set the dejitter shrink speed parameter
digit-collection	Define delayed dialing
dtmf-relay	Set the DTMF relay flag
echo-canceller	Enable or disable the echo canceller
fallback	Define the fallback routing element for the interface
interface h323	Enter H.323 interface configuration mode
portaddress	Define or delete port address used for H.323 calls
remoteip	Set or delete remote call signaling IP address
routing	Define the routing element for the interface
silence-compression	Enable or disable silence compression
use tone-set-profile	Link a tone-set profile to the selected interface
voice-volume	Set the voice volume

Table 18-1: Commands available in Interface H.323 Mode

bind gateway

[no] bind gateway <*name*>

Function

Bind selected interface to a H.323 gateway

Syntax Description

Option	**Description**
<*name*>	Name of the H.323 gateway

Default

By default the H.323 gateway named h323 is bound.

Mode

Interface H.323

Command Usage

This command is used to bind the H.323 voice interface to a specific H.323 gateway. There is currently only one H.323 gateway per system. Since all H.323 voice interfaces are bound per default to this gateway, there is currently no need to use this commend.

Example

The following example shows how to bind the interface to the H.323 gateway:

```
SN(if-h323)[<if-name>]#bind gateway h323
```

Related Commands

None

codec

[no] codec { g711alaw64k | g711ulaw64k | g723_6k3 | g729 | transparent } [exclusive]

Function

Define the audio codec to be used on selected interface

Syntax Description

Option	Description
g711alaw64k	G.711 A-Law 64 kbps
g711ulaw64k	G.711 u-Law 64 kbps
g723_6k3	G.723.1 6.3 kbps
g729	G.729a 8 kbps
transparent	Transparent ISDN data no echo cancellation
exclusive	Only the indicated codec is allowed

Default

If you do not specify a codec for the selected H.323 interface, the default codec specified in the H.323 gateway will be used.

Mode

Interface H.323

Command Usage

Defines the preferred codec for outbound calls over the voice interface. This command has only an effect, if the fastconnect procedure is used. The codec indicated in this command must also be present in the list of supported codecs of the H.323 gateway. If the *exclusive* option is specified, only the indicated codec will be allowed. If this codec is not supported by the remote system, the call will fail. The session-router will only select the voice interface, if the codec of the voice interface matches the codec of the inbound call, or if the codec of the inbound call cannot be determined at the time the routing decision has to be made.

Example

The following examples uses G.711 A-Law as the preferred codec

```
SN(if-h323)[<if-name>]#codec g711alaw64k
```

The next example forces G.729 to be used:

```
SN(if-h323)[<if-name>]#codec g729 exclusive
```

Related Commands

None

dejitter-grow-attenuation

dejitter-grow-attenuation <*dejitter_grow_attenuation*>

Function

Set the dejitter grow attenuation parameter

Syntax Description

Option	Description
<*dejitter_grow_attenuation*>	Dejitter grow attenuation

Default

No dejitter-grow-attenuation is defined in the interface. The value is taken from the voip-profile linked to the H.323 gateway.

Mode

Interface H.323

Command Usage

Overrides the setting in the voip-profile linked to H.323 gateway for all calls going through this interface.
See the dejitter-grow-attenuation command description in the ‘profile voip’ mode for details.

Example

The following example overrides the setting in the voip-profile linked to the H.323 gateway.

```
SN(if-h323)[<if-name>]#dejitter-grow-attenuation 3
```

Related Commands

Command	Description
dejitter-grow-attenuation	Set dejitter grow attenuation parameter
use profile voip	Link gateway to a VoIP profile

dejitter-grow-step

dejitter-grow-step <*dejitter_grow_step*>

Function

Set the dejitter grow step parameter

Syntax Description

Option	Description
<*dejitter_grow_step*>	Dejitter grow step

Default

No dejitter-grow-step is defined in the interface. The value is taken from the voip-profile linked to the H.323 gateway.

Mode

Interface H.323

Command Usage

Overrides the setting in the voip-profile linked to H.323 gateway for all calls going through this interface.
See the dejitter-grow-step command description in the ‘profile voip’ mode for details.

Example

The following example overrides the setting in the voip-profile linked to the H.323 gateway.

```
SN(if-h323)[<if-name>]#dejitter-grow-step 2
```

Related Commands

Command	Description
dejitter-grow-step	Set dejitter grow step parameter
use profile voip	Link gateway to a VoIP profile

dejitter-max-delay

dejitter-max-delay <*dejitter_max_delay*>

Function

Set the dejitter maximal delay

Syntax Description

Option	Description
<*dejitter_max_delay*>	Dejitter max delay

Default

No dejitter-max-delay is defined in the interface. The value is taken from the voip-profile linked to the H.323 gateway.

Mode

Interface H.323

Command Usage

Overrides the setting in the voip-profile linked to H.323 gateway for all calls going through this interface.
See the dejitter-max-delay command description in the 'profile voip' mode for details.

Example

The following example overrides the setting in the voip-profile linked to the H.323 gateway.

```
SN(if-h323)[<if-name>]#dejitter-max-delay 150
```

Related Commands

Command	Description
dejitter-max-delay	Set dejitter maximal delay
use profile voip	Link gateway to a VoIP profile

dejitter-max-packet-loss

dejitter-max-packet-loss <*dejitter_max_packet_loss*>

Function

Set the dejitter maximal packet loss

Syntax Description

Option	Description
<*dejitter_max_packet_loss*>	Dejitter max delay

Default

No dejitter-max-packet-loss is defined in the interface. The value is taken from the voip-profile linked to the H.323 gateway.

Mode

Interface H.323

Command Usage

Overrides the setting in the voip-profile linked to H.323 gateway for all calls going through this interface. See the dejitter-max-packet-loss command description in the 'profile voip' mode for details.

Example

The following example overrides the setting in the voip-profile linked to the H.323 gateway.

```
SN(if-h323)[<if-name>]#dejitter-max-packet-loss 3
```

Related Commands

Command	Description
dejitter-max-packet-loss	Set dejitter maximal packet loss
use profile voip	Link gateway to a VoIP profile

dejitter-mode

dejitter-mode { adaptive | static}

Function

Set the dejitter mode used on selected interface

Syntax Description

Option	Description
adaptive	Selects adaptive dejitter mode
static	Selects static dejitter mode

Default

No dejitter-mode is defined in the interface. The value is taken from the VoIP profile linked to the H.323 gateway.

Mode

Interface H.323

Command Usage

Overrides the setting in the voip-profile linked to H.323 gateway for all calls going through this interface.
See the dejitter-mode command description in the ‘profile voip’ mode for details.

Example

The following example overrides the setting in the voip-profile linked to the H.323 gateway.

```
SN(if-h323)[<if-name>]#dejitter-mode static
```

Related Commands

Command	Description
dejitter-mode	Set dejitter buffer operation mode
use profile voip	Link gateway to a VoIP profile

dejitter-shrink-speed

dejitter-shrink-speed <*dejitter_shrink_speed*>

Function

Set the dejitter shrink speed parameter

Syntax Description

Option	**Description**
<*dejitter_shrink_speed*>	Dejitter shrink speed

Default

No dejitter-shrink-speed is defined in the interface. The value is taken from the voip-profile linked to the H.323 gateway.

Mode

Interface H.323

Command Usage

Overrides the setting in the voip-profile linked to H.323 gateway for all calls going through this interface.
See the dejitter-shrink-speed command description in the 'profile voip' mode for details.

Example

The following example overrides the setting in the voip-profile linked to the H.323 gateway.

```
SN(if-h323)[<if-name>]#dejitter-shrink-speed 3
```

Related Commands

Command	**Description**
dejitter-shrink-speed	Set dejitter shrink speed parameter
use profile voip	Link gateway to a VoIP profile

digit-collection

[no] digit-collection { (timeout [*<val>* **]) | (terminating-char** *<val>* **) | (nr-length** *<val>* **) }**

Function

Define delayed dialing

Syntax Description

Option	Description
timeout	Dialing after a timeout
<val>	Timeout in seconds
terminating-char	Defines the dial termination character
<val>	Termination character
nr-length	Defines the minimum called-party number length
<val>	Minimum required number of digits

Default

None

Mode

Interface H.323

Command Usage

The command causes initiation of calls originated from this voice interface to be deferred until the condition indicated in this command is met. There are three different conditions, which can be specified. These conditions all be used separately, or they can also be combined. This feature is used whenever a gatekeeper or PBX requires a minimum number of called-party number digits or even the complete called-party number in the setup message. This is usually the case for systems, which do not support overlapped-dialing.

The first condition is a timeout, which indicates how long the call initiation shall be deferred after the last called party number digit has been received.

The second condition is a termination-character, which indicates that the number is now complete and the setup message can be sent. Usually the '#' character is used for this purpose, however any other E.164 character can be used. If the timeout condition is also used, the reception of the terminating-character will cause the setup to be sent, before the timeout expired.

The third condition is a minimal required number length. The setup message will under no circumstances be sent if not at lest the indicated minimum number of called-party number digits are ready to be sent. If also a timeout is specified, this timeout will only be started, after the minimum number of called-party number digits are ready. Also, if a terminating-character is defined, it will not cause a number to be sent, which is shorter than the configured minimal number-length. It can only be used to stop a pending timeout, and send the setup immediately instead.

Example

The following example waits for at least 3 digits befor forwarding the call-setup message to the physical interface:

```
SN(if-h323)[<if-name>]#digit-collection nr-length 3
```

The next example waits 3 seconds after the last called-party number digit has been received, or until the '#' character has been received, before sending the call-setup message:

```
SN(if-h323)[<if-name>]#digit-collection timeout 3
SN(if-h323)[<if-name>]#digit-collection terminating-char #
```

Related Commands

None

dtmf-relay

[no] dtmf-relay

Function

Set the DTMF relay flag

Syntax Description

Option	Description
This command has no keywords or options	

Default

No dtmf-relay setting is defined in the interface. The value is taken from the voip-profile linked to the H.323 gateway.

Mode

Interface H.323

Command Usage

Overrides the setting in the voip-profile linked to H.323 gateway for all calls going through this interface.
See the dtmf-relay command description in the ‘profile voip’ mode for details.

Example

The following example overrides the setting in the voip-profile linked to the H.323 gateway.

```
    SN(if-h323)[<if-name>]#no dtmf-relay
```

Related Commands

Command	Description
dtmf-relay	Enables or disables DTMF relay in profile VoIP mode
use voip-profile	Link gateway to a VoIP profile

echo-canceller

[no] echo-canceller

Function

Enable or disable the echo canceller

Syntax Description

Option	Description
This command has no keywords or options	

Default

No echo canceller setting is defined in the interface. The value is taken from the voip-profile linked to the H.323 gateway.

Mode

Interface H.323

Command Usage

Overrides the setting in the voip-profile linked to H.323 gateway for all calls going through this interface.
See the echo-canceller command description in the 'profile voip' mode for details.

Example

The following example overrides the setting in the voip-profile linked to the H.323 gateway.

```
SN(if-h323)[<if-name>]#no echo-canceller
```

Related Commands

Command	Description
echo-canceller	Enables or disables the echo canceller in profile VoIP mode
use profile voip	Link gateway to a VoIP profile

fallback

[no] fallback { (dest-table <*name*> **) | (dest-interface** <*name*> **) }**

Function

Define the fallback routing element for the interface

Syntax Description

Option	**Description**
dest-table	Use routing table as destination
<*name*>	Table name
dest-interface	Use interface as destination
<*name*>	Interface name

Default

None

Mode

Interface H.323

Command Usage

Defines the fallback (secondary) destination to be used for calls incoming over this voice interface. The fallback destination will be used, if the call-setup over the primary destination indicated in the 'routing' command failed. You may either indicate a routing-table or a voice-interface, to which the call shall be routed to.

Example

The following example defines the voice interface 'voif' to be used as fallback destination:

```
SN(if-h323)[<if-name>]#fallback dest-interface voif
```

The next example defines the routing table 'rtab' to be used as fallback destination:

```
SN(if-h323)[<if-name>]#fallback dest-table rtab
```

Related Commands

Command	**Description**
routing	Defines the primary routing destination for calls incoming over this voice interface.

interface h323

[no] interface h323 <*if-name*>

Function

Enter H.323 interface configuration mode

Syntax Description

Option	Description
<*if-name*>	Enter H.323 interface configuration mode Interface name

Default

None

Mode

Interface H.323

Command Usage

Enters H.323 voice interface configuration mode. If the interface does not already exist, it will be created. The inverted form of the command will delete the H.323 voice interface.

Example

The following examples creates a H.323 interface named <*if-name*>:

```
SN(ctx-cs)[switch]#interface h323 <if-name>
SN(if-h323)[if-name]#
```

The next example deletes the H.323 interface named <*if-name*>:

```
SN(ctx-cs)[switch]#no interface h323 <if-name>
```

Related Commands

Command	Description
interface pstn	Creates a PSTN voice interface
interface isoip	Creates an ISoIP voice interface

portaddress

[no] portaddress <*portaddress*>

Function

Define or delete port address used for H.323 calls

Syntax Description

Option	Description
<*portaddress*>	Port address (decimal)

Default

None

Mode

Interface H.323

Command Usage

Defines the portaddress to be used with the call. For outbound calls, this information is sent to the H.323 gateway. The gateway may (depending on the tunnelling protocol used) send the information to the remote peer, which can use the information to identify the physical destination PSTN port to be used for the call or signalling message. The H.323 gateway can use this information. For inbound calls, the session-router will look for a H.323 voice interface, which contains the portaddress of the incoming call. If found that interface will be used. If no interface with match portaddress is found, the call will be rejected. To use portaddresses, you need to enable ‘q931-tunneling’ in the H.323 gateway configuration mode.

Warning: Several ISDN supplementary services will not work, if this option is not configured.

Example

The following example sets the portaddress to 4:

```
SN(if-h323)[<if-name>]#portaddress 4
```

The next example removes the portaddress from the voice interface:

```
SN(if-h323)[<if-name>]#no portaddress
```

Related Commands

Command	Description
q931-tunneling	Enables Q.931 message tunneling and portaddress support in the H.323 gateway.

remoteip

[no] remoteip <*remote_ip*>

Function

Set or delete remote call signaling IP address

Syntax Description

Option	Description
<*remote_ip*>	IP address

Default

None

Mode

Interface H.323

Command Usage

Defines the IP destination call-signalling address for outbound calls on this interface. The session-router will select this interface for inbound calls, if the call-signalling IP address of the remote peer matches the IP address specified with this command. The remote IP address shall only be specified, if no gatekeeper is used. Otherwise, the gatekeeper will provide the remote IP address.

Warning: Do not use this command if a gatekeeper is used, as it might interfere with RAS signalling.

Example

The following examples sets the remote call-signalling IP address to 172.16.3.2:

```
SN(if-h323)[<if-name>]#remoteip 172.16.3.2
```

The next example removes the remote call-signalling IP address from the voice interface:

```
SN(if-h323)[<if-name>]#no remoteip
```

Related Commands

None

routing

[no] routing { (dest-table <*name*> **) | (dest-interface** <*name*> **) }**

Function

Define the routing element for the interface

Syntax Description

Option	Description
dest-table	Use routing table as destination
<*name*>	Table name
dest-interface	Use interface as destination
<*name*>	Interface name

Default

None

Mode

Interface H.323

Command Usage

The command is used to define the primary routing destination for the voice interface. The destination can either directly be another voice interface, or a routing table. All calls incoming on a voice interface will first be forwarded to the destination indicated in the 'routing' command. If the call-setup to this destination fails, the destination indicated in the 'fallback' command will be used.

Example

The following examples uses the voice interface 'vif' as the destination for all inbound calls:

```
    SN(if-h323)[<if-name>]#routing dest-interface vif
```

The next example uses the routing table 'rtab' as the destination for all inbound calls:

```
    SN(if-h323)[<if-name>]#routing dest-table rtab
```

Related Commands

Command	Description
fallback	Defines the fallback (secondary) destination for all inbound calls on this interface.

silence-compression

[no] silence-compression

Function

Enable or disable silence compression

Syntax Description

Option	Description
This command has no keywords or options	

Default

No silence compression setting is defined in the interface. The value is taken from the voip-profile linked to the H.323 gateway.

Mode

Interface H.323

Command Usage

Overrides the setting in the voip-profile linked to H.323 gateway for all calls going through this interface.
See the silence-compression command description in the 'profile voip' mode for details.

Example

The following example overrides the setting in the voip-profile linked to the H.323 gateway.

```
SN(if-h323)[<if-name>]#no silence-compression
```

Related Commands

Command	Description
silence-compression	Enable or disable silence compression or comfort noise generation in profile VoIP mode
use profile voip	Link gateway to a VoIP profile

use tone-set-profile

[no] use tone-set-profile <*name*>

Function

Link a tone-set profile to the selected interface

Syntax Description

Option	Description
<*name*>	Name of the tone-set

Default

No linkage is defined. The tone-set linked to context CS is used as default.

Mode

Interface H.323

Command Usage

A certain voice interface may be required to play tones that look different that the tones on other interfaces. This command defines that an own tone-set shall be used for all calls going through this interface. The setting here overrides the tone-set profile linked to the context CS.

Example

The following example defines that a special tone-set named *tonsetDE* shall be used on this interface:

```
SN(if-h323)[<if-name>]#use tone-set-profile tonsetDE
```

The next example unlinks any tone-set from the interface. The tone-set configured in context CS will be used further on.

```
SN(if-h323)[<if-name>]#no use tone-set-profile
```

Related Commands

Command	Description
use tone-set profile	Link to a tone profile
show profile tone-set	Display tone set information
profile tone-set	Enter tone set profile configuration mode

voice-volume

voice-volume <*voice_volume*>

Function

Set the voice volume

Syntax Description

Option	Description
<*voice_volume*>	Voice volume

Default

No voice volume setting is defined in the interface. The value is taken from the voip-profile linked to the H.323 gateway.

Mode

Interface H.323

Command Usage

Overrides the setting in the voip-profile linked to H.323 gateway for all calls going through this interface. See the voice-volume command description in the 'profile voip' mode for details.

Example

The following example overrides the setting in the voip-profile linked to the H.323 gateway.

```
SN(if-h323)[<if-name>]#voice-volume -10
```

Related Commands

Command	Description
voice-volume	Set the voice volume in interface ISoIP mode
use profile voip	Link gateway to a VoIP profile

19 INTERFACE ISOIP MODE

19.1 Command Overview

In this mode you may configure a SmartNode's ISoIP interface parameters. Defining the ISoIP gateway to which an ISoIP interface gets bound, the audio codec that is used, the dejitter behavior and other settings for an ISoIP interface is done using the interface ISoIP mode.

The commands that are available in this mode are listed in Table 19-1 below:

Command	Description
bind gateway isoip	Bind the selected interface to an ISoIP gateway
codec	Define audio codec to be used on selected interface
dejitter-grow-attenuation	Set the dejitter grow attenuation parameter
dejitter-grow-step	Set the dejitter grow step parameter
dejitter-max-delay	Set the dejitter maximum delay
dejitter-max-packet-loss	Set the dejitter maximum packet loss
dejitter-mode	Set the dejitter mode
dejitter-shrink-speed	Set the dejitter shrink speed parameter
digit-collection	Defines delayed dialing
dtmf-relay	Set the DTMF relay flag
echo-canceller	Enable or disable the echo canceller
fallback	Define the fallback routing element for the selected interface
interface isoip	Enter ISoIP interface configuration mode
portaddress	Set or clear port address
remoteip	Set or clear remote call signaling IP address
routing	Define the routing element for the selected interface
silence-compression	Enable or disable silence compression on selected interface
use tone-set-profile	Link tone-set profile to the selected interface
voice-volume	Set the voice volume

Table 19-1: Commands available in Interface ISoIP Mode

bind gateway isoip

[no] bind gateway isoip

Function

Bind the selected interface to an ISoIP gateway

Syntax Description

Option	**Description**
This command has no keywords or options	

Default

None

Mode

Interface ISoIP

Command Usage

This command is used to bind the ISoIP voice interface to a specific ISoIP gateway. There is currently only one ISoIP gateway per system. Since all ISoIP voice interfaces are bound per default to this gateway, there is currently no need to use this commend.

Example

The following example shows how to bind the interface <*if-name*> to the ISoIP gateway:

```
SN(if-isoip)[<if-name>]#bind gateway isoip
```

Related Commands

None

codec

[no] codec { transparent | g711alaw64k | g711ulaw64k | g723_5k3 | g723_6k3 | g729 | g726_16k | g726_24k | g726_32k | g726_40k | g727_16k | g727_24k | g727_32k | netcoder_6k4 | netcoder_9k6 } [<*tx_packet_length*> **]**

Function

Define the audio codec to be used on selected interface

Syntax Description

Option	Description
transparent	Transparent ISDN data no echo cancellation
g711alaw64k	G.711 A-Law 64 kbps
g711ulaw64k	G.711 u-Law 64 kbps
g723_5k3	G.723.1 5.3 kbps
g723_6k3	G.723.1 6.3 kbps
g729	G.729a 8 kbps
g726_16k	G.726 16 kbps
g726_24k	G.726 24 kbps
g726_32k	G.726 32 kbps
g726_40k	G.726 40 kbps
g727_16k	G.727 16 kbps
g727_24k	G.727 24 kbps
g727_32k	G.727 32 kbps
netcoder_6k4	Netcoder 6.4 kbps (comparable to G.723)
netcoder_9k6	Netcoder 9.6 kbps (comparable to G.723)
<*tx_packet_length*>	Maximum size of transmitted voice packets

Default

If you do not specify a codec for the selected ISoIP interface, the default codec specified in the ISoIP gateway will be used.

Mode

Interface ISoIP

Command Usage

Defines the codec for outbound calls over the voice interface. The session-router will only select the voice interface, if the codec of the voice interface matches the codec of the inbound call. The option *tx_packet_length* indicates how many milliseconds of voice-data shall be sent within one RTP packet. If this option is not specified, the codec defined in the ISoIP gateway configuration will be used.

Example

The following example uses G.723 at 6.3 kbps with a packetization time of 60 milliseconds:

```
SN(if-isoip)[<if-name>]#codec g723_6k3 60
```

The next example removes the codec option from the voice interface:

```
SN(if-isoip)[<if-name>]#no codec
```

Related Commands

None

dejitter-grow-attenuation

dejitter-grow-attenuation <*dejitter_grow_attenuation*>

Function

Set the dejitter grow attenuation parameter

Syntax Description

Option	Description
<*dejitter_grow_attenuation*>	Dejitter grow attenuation

Default

No dejitter-grow-attenuation is defined in the interface. The value is taken from the voip-profile linked to the ISoIP gateway.

Mode

Interface ISoIP

Command Usage

Overrides the setting in the voip-profile linked to ISoIP gateway for all calls going through this interface. See the dejitter-grow-attenuation command description in the Profile VoIP Mode for details.

Example

The following example overrides the setting in the voip-profile linked to the ISoIP gateway.

```
SN(if-isoip)[<if-name>]#dejitter-grow-attenuation 3
```

Related Commands

Command	Description
dejitter-grow-attenuation	Set dejitter grow attenuation parameter
use profile voip	Link gateway to a VoIP profile

dejitter-grow-step

dejitter-grow-step <*dejitter_grow_step*>

Function

Set the dejitter grow step parameter

Syntax Description

Option	Description
<*dejitter_grow_step*>	Dejitter grow step

Default

No dejitter-grow-step is defined in the interface. The value is taken from the voip-profile linked to the ISoIP gateway.

Mode

Interface ISoIP

Command Usage

Overrides the setting in the voip-profile linked to ISoIP gateway for all calls going through this interface.
See the dejitter-grow-step command description in the 'profile voip' mode for details.

Example

The following example overrides the setting in the voip-profile linked to the ISoIP gateway.

```
SN(if-isoip)[<if-name>]#dejitter-grow-step 2
```

Related Commands

Command	Description
dejitter-grow-step	Set dejitter grow step parameter
use profile voip	Link gateway to a VoIP profile

dejitter-max-delay

dejitter-max-delay <*dejitter_max_delay*>

Function

Set the dejitter maximum delay

Syntax Description

Option	**Description**
<*dejitter_max_delay*>	Dejitter max delay

Default

No dejitter-max-delay is defined in the interface. The value is taken from the voip-profile linked to the ISoIP gateway.

Mode

Interface ISoIP

Command Usage

Overrides the setting in the voip-profile linked to ISoIP gateway for all calls going through this interface.
See the dejitter-max-delay command description in the 'profile voip' mode for details.

Example

The following example overrides the setting in the voip-profile linked to the ISoIP gateway.

```
SN(if-isoip)[<if-name>]#dejitter-max-delay 150
```

Related Commands

Command	**Description**
dejitter-max-delay	Set dejitter maximal delay parameter
use profile voip	Link gateway to a VoIP profile

dejitter-max-packet-loss

dejitter-max-packet-loss <*dejitter_max_packet_loss*>

Function

Set the dejitter maximum packet loss

Syntax Description

Option	**Description**
<*dejitter_max_packet_loss*>	Dejitter max delay

Default

No dejitter-max-packet-loss is defined in the interface. The value is taken from the voip-profile linked to the ISoIP gateway.

Mode

Interface ISoIP

Command Usage

Overrides the setting in the voip-profile linked to ISoIP gateway for all calls going through this interface.
See the dejitter-max-packet-loss command description in the 'profile voip' mode for details.

Example

The following example overrides the setting in the voip-profile linked to the ISoIP gateway.

```
SN(if-isoip)[<if-name>]#dejitter-max-packet-loss 3
```

Related Commands

Command	**Description**
dejitter-max-packet-loss	Set dejitter maximal packet loss parameter
use profile voip	Link gateway to a VoIP profile

dejitter-mode

dejitter-mode { adaptive | static }

Function

Set the dejitter mode

Syntax Description

Option	Description
adaptive	Select adaptive dejitter mode
static	Select static dejitter mode

Default

No dejitter-mode is defined in the interface. The value is taken from the voip-profile linked to the ISoIP gateway.

Mode

Interface ISoIP

Command Usage

Overrides the setting in the voip-profile linked to ISoIP gateway for all calls going through this interface.
See the dejitter-mode command description in the 'profile voip' mode for details.

Example

The following example overrides the setting in the voip-profile linked to the ISoIP gateway.

```
SN(if-isoip)[<if-name>]#dejitter-mode static
```

Related Commands

Command	Description
dejitter-mode	Set dejitter buffer operation mode
use profile voip	Link gateway to a VoIP profile

dejitter-shrink-speed

dejitter-shrink-speed <*dejitter_shrink_speed*>

Function

Set the dejitter shrink speed parameter

Syntax Description

Option	**Description**
<*dejitter_shrink_speed*>	Dejitter shrink speed

Default

No dejitter-shrink-speed is defined in the interface. The value is taken from the voip-profile linked to the ISoIP gateway.

Mode

Interface ISoIP

Command Usage

Overrides the setting in the voip-profile linked to ISoIP gateway for all calls going through this interface.
See the dejitter-shrink-speed command description in the 'profile voip' mode for details.

Example

The following example overrides the setting in the voip-profile linked to the ISoIP gateway.

```
SN(if-isoip)[<if-name>]#dejitter-shrink-speed 3
```

Related Commands

Command	**Description**
dejitter-shrink-speed	Set dejitter shrink speed parameter
use profile voip	Link gateway to a VoIP profile

digit-collection

[no] digit-collection {(timeout [*<val>* **]) | (terminating-char** *<val>* **) | (nr-length** *<val>* **) }**

Function

Defines delayed dialing

Syntax Description

Option	Description
timeout	Dialing after a timeout
<val>	Timeout in seconds
terminating-char	Defines the dial termination character
<val>	Termination character
nr-length	Defines the minimum called-party number length
<val>	Minimum required number of digits

Default

None

Mode

Interface ISoIP

Command Usage

The command causes initiation of calls originated from this voice interface to be deferred until the condition indicated in this command is met. There are three different conditions, which can be specified. These conditions all be used separately, or they can also be combined. This feature is used whenever a gatekeeper or PBX requires a minimum number of called-party number digits or even the complete called-party number in the setup message. This is usually the case for systems, which do not support overlapped-dialing.

The first condition is a timeout, which indicates how long the call initiation shall be deferred after the last called party number digit has been received.

The second condition is a termination-character, which indicates that the number is now complete and the setup message can be sent. Usually the '#' character is used for this purpose, however any other E.164 character can be used. If the timeout condition is also used, the reception of the terminating-character will cause the setup to be sent, before the timeout expired.

The third condition is a minimal required number length. The setup message will under no circumstances be sent if not at lest the indicated minimum number of called-party number digits are ready to be sent. If also a timeout is specified, this timeout will only be started, after the minimum number of called-party number digits are ready. Also, if a terminating-character is defined, it will not cause a number to be sent, which is shorter than the configured minimal number-length. It can only be used to stop a pending timeout, and send the setup immediately instead.

Example

The following example waits for at least 3 digits befor forwarding the call-setup message to the physical interface:

```
SN(if-isoip)[<if-name>]#digit-collection nr-length 3
```

The next example waits 3 seconds after the last called-party number digit has been received, or until the '#' character has been received, before sending the call-setup message:

```
SN(if-isoip)[<if-name>]#digit-collection timeout 3
SN(if-isoip)[<if-name>]#digit-collection terminating-char #
```

Related Commands

None

dtmf-relay

[no] dtmf-relay

Function

Set the DTMF relay flag

Syntax Description

Option	Description
This command has no keywords or options	

Default

No dtmf-relay setting is defined in the interface. The value is taken from the voip-profile linked to the ISoIP gateway.

Mode

Interface ISoIP

Command Usage

Overrides the setting in the voip-profile linked to ISoIP gateway for all calls going through this interface.
See the dtmf-relay command description in the ‘profile voip’ mode for details.

Example

The following example overrides the setting in the voip-profile linked to the ISoIP gateway.

```
SN(if-isoip)[<if-name>]#no dtmf-relay
```

Related Commands

Command	Description
dtmf-relay	Enables or disables DTMF relay in profile VoIP mode
use profile voip	Link gateway to a VoIP profile

echo-canceller

[no] echo-canceller

Function

Enable or disable the echo canceller

Syntax Description

Option	Description
This command has no keywords or options	

Default

No echo canceller setting is defined in the interface. The value is taken from the voip-profile linked to the ISoIP gateway.

Mode

Interface ISoIP

Command Usage

Overrides the setting in the voip-profile linked to ISoIP gateway for all calls going through this interface.
See the echo-canceller command description in the ‘profile voip’ mode for details.

Example

The following example overrides the setting in the voip-profile linked to the ISoIP gateway.

```
    SN(if-isoip)[<if-name>]#no echo-canceller
```

Related Commands

Command	Description
echo-canceller	Enables or disables the echo canceller in profile VoIP mode
use profile voip	Link gateway to a VoIP profile

fallback

[no] fallback { (dest-table *<name>* **) | (dest-interface** *<name>* **) }**

Function

Define the fallback routing element for the selected interface

Syntax Description

Option	Description
dest-table	Use routing table as destination
<name>	Table name
dest-interface	Use interface as destination
<name>	Interface name

Default

None

Mode

Interface ISoIP

Command Usage

Defines the fallback (secondary) destination to be used for calls incoming over this voice interface. The fallback destination will be used, if the call-setup over the primary destination indicated in the 'routing' command failed. You may either indicate a routing-table or a voice-interface, to which the call shall be routed.

Example

The following example defines the voice interface 'voif' to be used as fallback destination:

```
SN(if-isoip)[<if-name>]#fallback dest-interface voif
```

The next example defines the routing table 'rtab' to be used as fallback destination:

```
SN(if-isoip)[<if-name>]#fallback dest-table rtab
```

Related Commands

Command	Description
routing	Defines the primary routing destination for calls incoming over this voice interface.

interface isoip

[no] interface isoip <*if-name*>

Function

Enter ISoIP interface configuration mode

Syntax Description

Option	Description
isoip	Enter ISoIP interface configuration mode
<*if-name*>	Interface name

Default

None

Mode

Interface ISoIP

Command Usage

Enters ISoIP voice interface configuration mode. If the interface does not already exist, it will be created. The inverted form of the command will delete the ISoIP voice interface.

Example

The following examples creates a ISoIP interface named <*if-name*>:

```
SN(ctx-cs)[switch]#interface isoip <if-name>
SN(if-isoip)[<if-name>]#
```

The next example deletes the PSTN interface named <*if-name*>:

```
SN(ctx-cs)[switch]#no interface isoip <if-name>
```

Related Commands

Command	Description
Interface pstn	Creates a PSTN voice interface
Interface h323	Creates an H.323 voice interface

portaddress

[no] portaddress <*portaddress*>

Function

Set or clear port address

Syntax Description

Option	**Description**
<*portaddress*>	Port address (decimal)

Default

None

Mode

Interface ISoIP

Command Usage

Defines the portaddress to be used with the call. For outbound calls, this information is forwarded by the ISoIP gateway to the remote gateway. The remote gateway passes the information to its session-router. The session-router will use the information to select a corresponding ISoIP voice interface for the inbound call, which also contains the same portaddress. If no interface with a matching portaddress is found for an inbound call, the call will be rejected.

Warning: Several ISDN supplementary services will not work, if this option is not configured.

Example

The following example sets the portaddress to 4:

```
SN(if-isoip)[<if-name>]#portaddress 4
```

The next example removes the portaddress from the voice interface:

```
SN(if-isoip)[<if-name>]#no portaddress
```

Related Commands

None

remoteip

[no] remoteip <*remote_ip*>

Function

Set or clear remote call signaling IP address

Syntax Description

Option	Description
<*remote_ip*>	IP address

Default

Node

Mode

Interface ISoIP

Command Usage

Defines the IP destination address for all outbound calls on this voice interface. Also the session-router will use this voice interface for inbound calls, if the remote IP address of the inbound call matches the IP address specified using this command. Specifying this option is required for outbound calls to be possible on the voice interface.

Example

The following examples sets the remote IP address to 172.16.7.4:

```
SN(if-isoip)[<if-name>]#remoteip 172.16.7.4
```

The next example removes the remote call-signalling IP address from the voice interface:

```
SN(if-isoip)[<if-name>]#no remoteip
```

Related Commands

None

routing

[no] routing { (dest-table <*name*> **) | (dest-interface** <*name*> **) }**

Function

Define the routing element for the selected interface

Syntax Description

Option	Description
dest-table	Use routing table as destination
<*name*>	Table name
dest-interface	Use interface as destination
<*name*>	Interface name

Default

None

Mode

Interface ISoIP

Command Usage

The command is used to define the primary routing destination for the voice interface. The destination can either directly be another voice interface, or a routing table. All calls incoming on a voice interface will first be forwarded to the destination indicated in the 'routing' command. If the call-setup to this destination fails, the destination indicated in the 'fallback' command will be used.

Example

The following examples uses the voice interface 'vif' as the destination for all inbound calls:

```
SN(if-isoip)[<if-name>]#routing dest-interface vif
```

The next example uses the routing table 'rtab' as the destination for all inbound calls:

```
SN(if-isoip)[<if-name>]#routing dest-table rtab
```

Related Commands

Command	Description
fallback	Defines the fallback (secondary) destination for all inbound calls on this interface.

silence-compression

[no] silence-compression

Function

Enable or disable silence compression on selected interface

Syntax Description

Option	Description
This command has no keywords or options	

Default

No silence compression setting is defined in the interface. The value is taken from the voip-profile linked to the ISoIP gateway.

Mode

Interface ISoIP

Command Usage

Overrides the setting in the voip-profile linked to ISoIP gateway for all calls going through this interface.
See the silence-compression command description in the 'profile voip' mode for details.

Example

The following example overrides the setting in the voip-profile linked to the ISoIP gateway.

```
    SN(if-isoip)[<if-name>]#no silence-compression
```

Related Commands

Command	Description
silence-compression	Enable or disable silence compression or comfort noise generation in profile VoIP mode
use profile voip	Link gateway to a VoIP profile

use tone-set-profile

[no] use tone-set-profile <*name*>

Function

Link tone-set profile to the selected interface

Syntax Description

Option	Description
<*name*>	Name of the tone-set

Default

No linkage is defined. The tone-set linked to context CS is used as default.

Mode

Interface ISoIP

Command Usage

A certain voice interface may be required to play tones that look different that the tones on other interfaces. This command defines that an own tone-set shall be used for all calls going through this interface. The setting here overrides the tone-set profile linked to the context CS.

Example

The following example defines that a special tone-set named *tonsetDE* shall be used on this interface:

```
SN(if-isoip)[<if-name>]#use tone-set-profile tonsetDE
```

The next example unlinks any tone-set from the interface. The tone-set configured in context CS will be used further on.

```
SN(if-isoip)[<if-name>]#no use tone-set-profile
```

Related Commands

Command	Description
use tone-set profile	Link to a tone profile
show profile tone-set	Display tone set information
profile tone-set	Enter tone set profile configuration mode

voice-volume

voice-volume <*voice_volume*>

Function

Set the voice volume

Syntax Description

Option	Description
<*voice_volume*>	Voice volume

Default

No voice volume setting is defined in the interface. The value is taken from the voip-profile linked to the ISoIP gateway.

Mode

Interface ISoIP

Command Usage

Overrides the setting in the voip-profile linked to ISoIP gateway for all calls going through this interface.
See the voice-volume command description in the 'profile voip' mode for details.

Example

The following example overrides the setting in the voip-profile linked to the ISoIP gateway.

```
SN(if-isoip)[<if-name>]#voice-volume -10
```

Related Commands

Command	Description
voice-volume	Set the voice volume in interface H.323 mode
use profile voip	Link gateway to a VoIP profile

20 GATEWAY H.323 MODE

20.1 Command Overview

When communication is required between different networks a gateway is always needed between them. A gateway provides:

- Data format translation, e.g. audio and video CODEC translation
- Control signalling translation, e.g call setup and termination functionality on both sides of a network.

In the case of SmartWare, a gateway connects two contexts of different types, for example the CS and the IP context. It handles connections between different technologies or protocols and contains general gateway configuration parameters. In SmartWare there is an ISoIP and an H.323 gateway. The ISoIP and H.323 interfaces in the CS context are implicitly bound to these gateways. The H.323 gateway must be bound explicitly to interfaces in the IP context. SmartWare currently supports one instance of each gateway. The name of the H.323 gateway is *h323*.

The commands that are available in this mode are listed in Table 20-1 below:

Command	Description
codec	Define allowed audio codecs for H.323 gateway
early-h245	Enable or disable early H.245 initiation for H.323 gateway
faststart	Enable or disable faststart for a H.323 version 2 fast connect procedure
gatekeeper-discovery	Configure the gatekeeper discovery feature
gateway h323	Enter H.323-gateway configuration mode
q931-tunneling	Enable or disable the Q.931 tunneling feature
ras	Enable or disable the RAS feature in the H.323 gateway
shutdown	Enable or disable H.323 gateway
use voip-profile	Link H.323 gateway to a VoIP profile
alias	Define or delete a H.323 gateway alias
bind interface	Bind the H.323 gateway to an IP interface
call-signaling-port	Defines the call signaling port number for H.323

Table 20-1: Commands available in Gateway H.323 Mode

codec

[no] codec { g711alaw64k | g711ulaw64k | g723_6k3 | g729 | transparent } [*<txlen> <rxlen>* **]**

Function

Define allowed audio codecs for H.323 gateway

Syntax Description

Option	Description
g711alaw64k	G.711 A-Law 64 kbps
g711ulaw64k	G.711 u-Law 64 kbps
g723_6k3	G.723.1 6.3 kbps
g729	G.729a 8 kbps
transparent	Transparent ISDN data no echo cancellation
<txlen>	Length of transmitted RTP packets [ms]
<rxlen>	Announced length capability for received RTP packets [ms]

Default

None

Mode

Gateway H.323

Command Usage

Defines the audio codecs, which are allowed for use with the H.323 gateway. Multiple codecs can be added. The first codec in the list is used as the preferred codec, if the H.323 voice interface does not define a different preferred codec. The 'txlen' indicates the packetization period in milliseconds used for the transmission of the media-streams. The 'rxlen' option is the maximum receive capability (maximum number of milliseconds of voice data sent in each RTP packet) announced in the H.323 signalling to the remote system

Note: At least one codec must be defined, otherwise the H.323 gateway cannot establish any media-channels for voice calls. Depending on the preferred codec of the remote H.323 entity, it is not guaranteed that the preferred codec will be used even if both H.323 entities participating in the call support it.

Example

The following example adds G.729 with a packetization period of 10 milliseconds and a maximum receive capability of 20 milliseconds to the list of supported codecs:

```
SN(gw-h323)[h323]#codec g729 10 20
```

The next example removes all codecs from the list:

```
SN(gw-h323)[h323]#no codec
```

Related Commands

None

early-h245

[no] early-h245

Function

Enable or disable early H.245 initiation for H.323 gateway

Syntax Description

Option	Description
This command has no keywords or options	

Default

None

Mode

Gateway H.323

Command Usage

If enabled, the H.323 gateway, will try to open the H.245 channel as early as possible in the call initiation process. This allows call progress tones present before the connect message passes (for example ringback tones) to be passed through the gateway. If disabled the H.323 gateway will not try to open the H.245 channel before the H.225 connect message. In this case the media-channels can also not be opened before the connect message. This command does usually not affect calls, which use the fastconnect procedure. For such calls, the H.245 connection will only be opened, if required (for example for DTMF tone relaying).

Note: Some H.323 entities do not implement the early-h245 procedure as defined in the H.323 standard. For compatibility with such entities, the early-h245 procedure must be disabled. In order for changes of this setting to take effect, you need to restart the H.323 gateway.

Example

The following example enables the early-h245 procedure:

```
SN(gw-h323)[h323]#early-h245
```

The next example disables the early-h245 procedure:

```
SN(gw-h323)[h323]#no early-h245
```

Related Commands

None

faststart

[no] faststart

Function

Enable or disable faststart for a H.323 version 2 fast connect procedure

Syntax Description

Option	Description
This command has no keywords or options	

Default

None

Mode

Gateway H.323

Command Usage

Enables or disables use of a H.323 version 2 fast connect procedure.

Example

The following example enables the fastconnect procedure:

```
SN(gw-h323)[h323]#faststart
```

The next example disables the fastconnect procedure:

```
SN(gw-h323)[h323]#no faststart
```

Related Commands

None

gatekeeper-discovery

gatekeeper-discovery { (auto [<*gkid*> **]) | (manual** <*ip_address*> <*ip_port*> **[** <*gkid*> **]) }**

Function

Configure the gatekeeper discovery feature

Syntax Description

Option	Description
auto	Use automatic discovery
<*gkid*>	Gatekeeper-id
manual	Use manual discovery
<*ip_address*>	Gatekeeper ip-address
<*ip_port*>	Defines the RAS UDP port number (1719 is usually fine)
<*gkid*>	Gatekeeper-id

Default

None

Mode

Gateway H.323

Command Usage

Defines the gatekeeper discovery method. If auto is specified, the gatekeeper will be discovered automatically using gatekeeper request (GRQ) messages.

If ‘manual’ is specified, the ‘ip_address’ and ‘ip_port’ must also be specified. In that case, the H.323 will try to register with the gatekeeper at the specified address. It is possible to define up to three different manual gatekeeper discovery entries. The H.323 gateway will then try to register with one after the other of these gatekeepers, until one of them confirms the registration.

In both cases, if the gatekeeper-id is specified, the gateway, will only register with gatekeepers that have the specified gatekeeper-id.

Note: This setting is only used, if gatekeeper support is enabled using the ‘ras’ command. In order for changes of this setting to take effect, you need to restart the H.323 gateway.

Example

The following examples defines two manual gatekeeper discovery entries:

```
SN(gw-h323)[h323]#gatekeeper-discovery manual 172.16.3.2 1719
SN(gw-h323)[h323]#gatekeeper-discovery manual 172.16.3.3 1719
```

The next example forces autodiscover of the gatekeeper with gatekeeper-id *mygk*:

```
    SN(gw-h323)[h323]#gatekeeper-discovery auto mygk
```

Related Commands

Command	Description
ras	Enable or disable the RAS feature in the H.323 gateway

gateway h323

gateway h323 [<*name*> **]**

Function

Enter H.323-gateway configuration mode

Syntax Description

Option	**Description**
h323	Enter H.323-gateway configuration mode
<*name*>	H.323-gateway name

Default

The default gateway name is *h323*

Mode

Gateway H.323

Command Usage

This command enters the configuration mode for a H.323 gateway. There is currently only one H.323 gateway, which is named *h323*. This is also the default name used in this command.

Example

The following example shows how to enter the H.323 gateway configuration mode:

```
SN(cfg)#gateway h323 h323
SN(gw-h323)[h323]#
```

Related Commands

None

q931-tunneling

[no] q931-tunneling

Function

Enable or disable the Q.931 tunneling feature

Syntax Description

Option	Description
This command has no keywords or options	

Default

None

Mode

Gateway H.323

Command Usage

This command enables tunnelling of ISDN signalling messages over the H.323 protocol. If this feature is enabled, many of the ISDN supplementary services will be available, even, if the call is tunnelled over an IP network using H.323. Q931-tunneling is also required, if a 'portaddress' shall be used in the H.323 voice interface. This feature can only be used, if both H.323 entities involved in the call support q931-tunneling. Otherwise a normal H.323 call without q931- tunnelling will be initiated, even if q931-tunneling is enabled.

Note: In order for changes of this setting to take effect, you need to restart the H.323 gateway.

Example

The following example shows how to enable Q.931 message tunnelling:

```
    SN(gw-h323)[h323]#q931-tunneling
```

The next example disable Q.931 message tunnelling:

```
    SN(gw-h323)[h323]#no q931-tunneling
```

Related Commands

Command	Description
portaddress	Defines a portaddress to be used for calls passing through a specific voice interface.

ras

[no] ras

Function

Enable or disable the Registration Authentication Service (RAS) feature in the H.323 gateway

Syntax Description

Option	Description
This command has no keywords or options	

Default

None

Mode

Gateway H.323

Command Usage

Enables or disables gatekeeper support by enabling or disabling the RAS protocol. If enabled, the gatekeeper discovery method must also be defined using the ‘gatekeeper-discovery’ command.

Warning: In order for changes of this setting to take effect, you need to restart the H.323 gateway.

Example

The following example enables gatekeeper support:

```
    SN(gw-h323)[h323]#ras
```

The next example disables gatekeeper support:

```
    SN(gw-h323)[h323]#no ras
```

Related Commands

Command	Description
gatekeeper-discovery	Configure the gatekeeper discovery feature

shutdown

[no] shutdown

Function

Enable or disable H.323 gateway

Syntax Description

Option	Description
This command has no keywords or options	

Default

None

Mode

Gateway H.323

Command Usage

This command enables or disables the H.323 gateway.

Warning: Any ongoing calls on the H.323 gateway will be closed immediately, if the gateway is stopped using the ‘shutdown’ command.

Example

The following example stops the H.323 gateway:

```
SN(gw-h323)[h323]#shutdown
```

The next example starts the H.323 gateway:

```
SN(gw-h323)[h323]#no shutdown
```

Related Commands

None

use voip-profile

use voip-profile <*profile_name*>

Function

Link gateway to a VoIP profile

Syntax Description

Option	Description
<*profile_name*>	VoIP profile name

Default

The voip-profile named ‘default’ is linked to the H.323 gateway.

Mode

Gateway H.323

Command Usage

All parameters that define a voice over ip connection from the bearer channel point of view, are collected in voip-profiles (see mode ‘profile voip’). Several of these profiles can be defined in parallel. This command tells the H.323 gateway, from which profile it should take the parameters to open the bearer channel over IP.
The settings of the profile linked here can be selectively overwritten in the H.323 interfaces (see H.323 interface mode).

Example

The following example links the voip-profile named lowRate to the H.323 gateway.

```
SN(gw-h323)[h323]#use voip-profile lowRate
```

Related Commands

Command	Description
interface h323	Enter H.323 interface configuration mode
profile voip	Enter VoIP profile mode

alias

[no] alias { h323-id | e164 } <*alias*>

Function

Define or delete a H.323 gateway alias

Syntax Description

Option	Description
h323-id	H.323-ID
e164	E.164 alias
<*alias*>	Alias name

Default

None

Mode

Gateway H.323

Command Usage

The command adds H.323 aliases to the H.323 gateway. These aliases are mainly used for registration with the gatekeeper. The supported alias types are H.323-ID and E.164 number.

Example

The following example adds two E.164 numbers and a H.323-ID:

```
    SN(gw-h323)[h323]#alias e164 0311234567
    SN(gw-h323)[h323]#alias e164 0312345678
    SN(gw-h323)[h323]#alias h323-id pstngw
```

The next example removes all E.64 aliases:

```
    SN(gw-h323)[h323]#no alias e164
```

Related Commands

None

bind interface

[no] bind interface *<if>* **[** *<name>* **]**

Function

Bind the H.323 gateway to an IP interface

Syntax Description

Option	Description
<if>	Name of the IP interface
<name>	Name of the IP context

Default

None

Mode

Gateway H.323

Command Usage

The command binds the H.323 gateway to the IP-address of the specified IP-interface. This means, that the gateway always uses that IP-address, when it needs to provide an IP-address in the call signalling to the remote H.323 entity. There is currently one IP context is allowed in the system, which is called 'router'. Since this is also the default for this command, it needs not be specified explicitly. Even if the H.323 gateway is bound to one specific interface, it is also possible to make H.323 calls over any other interface. However, in that case any IP terminal, which wants to communicate with the H.323 gateway, needs to have an explicit IP route to the subnet, which contains the IP address to which the H.323 gateway is bound.

Note: The H.323 gateway will not start, if it is not bound to an IP interface.

Example

The following example binds the H.323 gateway to the IP interface eth2 of the IP context:

```
SN(gw-h323)[h323]#bind interface eth2
```

Related Commands

None

call-signaling-port

call-signaling-port <*ip_port*>

Function

Defines the call signaling port number for H.323

Syntax Description

Option	**Description**
<*ip_port*>	The call-signaling port number for H.323

Default

The call signaling port number is set for TCP to port 1720 by default.

Mode

Gateway H.323

Command Usage

The command defines the TCP port number on which the H.323 gateway listens for incoming call-signalling connections. According to the H.323 standard this is 1720, which should normally not be changed.

Example

The following example sets the call-signalling port to 1830:

```
SN(gw-h323)[h323]#call-signaling-port 1830
```

Related Commands

None

21 GATEWAY ISOIP MODE

21.1 Command Overview

When communication is required between different networks a gateway is always needed between them. A gateway provides:

- Data format translation, e.g. audio and video CODEC translation
- Control signalling translation, e.g call setup and termination functionality on both sides of a network.

In the case of SmartWare, a gateway connects two contexts of different types, for example the CS and the IP context. It handles connections between different technologies or protocols and contains general gateway configuration parameters. In SmartWare there is an ISoIP and an H.323 gateway. The ISoIP and H.323 interfaces in the CS context are implicitly bound to these gateways. The ISoIP gateway detects the correct IP interface on the IP context for its call automatically therefore no binding is needed. SmartWare currently supports one instance of each gateway. The name of the ISoIP gateway is *isoip*.

The commands that are available in this mode are listed in Table 21-1 below:

Command	Description
codec	Define the default audio codec
gateway isoip	Enter ISoIP gateway configuration mode
shutdown	Enable or disable ISoIP gateway
use voip-profile	Link ISoIP gateway to a VoIP profile

Table 21-1: Commands available in Gateway ISoIP Mode

codec

[no] codec { g711alaw64k | g711ulaw64k | g723_6k3 | g723_5k3 | g729 | transparent | g726_16k | g726_24k | g726_32k | g726_40k | g727_16k | g727_24k | g727_32k | netcoder_6k4 | netcoder_9k6 } [<*tx_packet_length*>]

Function

Define the default audio codec

Syntax Description

Option	Description
g711alaw64k	G.711 A-Law 64 kbps
g711ulaw64k	G.711 u-Law 64 kbps
g723_6k3	G.723.1 5.3 kbps
g723_5k3	G.723.1 6.3 kbps
g729	G.729a 8 kbps
transparent	Transparent ISDN data no echo cancellation
g726_16k	G.726 16 kbps
g726_24k	G.726 24 kbps
g726_32k	G.726 32 kbps
g726_40k	G.726 40 kbps
g727_16k	G.727 16 kbps
g727_24k	G.727 24 kbps
g727_32k	G.727 32 kbps
netcoder_6k4	Netcoder 6.4 kbps (comparable to G.723)
netcoder_9k6	Netcoder 9.6 kbps (comparable to G.723)
<*tx_packet_length*>	Maximum size of transmitted voice packets

Default

None

Mode

Gateway ISoIP

Command Usage

Defines the default audio codec to be used for outbound calls on this IsoIP gateway. If a different codec has been specified in the IsoIP voice interface, that codec will be used instead of the codec specified here. If 'txlen' is not specified, the minimum, which is allowed for the requested codec is used. If neither in the IsoIP gateway nor in the IsoIP voice interface a codec is specified, G.711 A-Law with a packetization period of 10 milliseconds will be used.

Example

The following examples defines G.729 with packetization period of 20ms to be used as the default audio codec:

```
    SN(gw-isoip)[isoip]#codec g729 20
```

The next example removes the default codec:

```
    SN(gw-isoip)[isoip]#no codec
```

Related Commands

None

gateway isoip

gateway isoip [<*name*> **]**

Function

Enter ISoIP gateway configuration mode

Syntax Description

Option	Description
<*name*>	ISoIP gateway name

Default

If no gateway name is specified *isoip* is used as default.

Mode

Gateway ISoIP

Command Usage

This command enters the configuration mode for an ISoIP gateway. There is at this time only one ISoIP gateway, which is named *isoip*. This is also the default name used in this command.

Example

The following example shows how to enter the ISoIP gateway configuration mode:

```
SN(cfg)#gateway isoip isoip
SN(gw-isoip)[isoip]#
```

Related Commands

None

shutdown

[no] shutdown

Function

Enable or disable ISoIP gateway

Syntax Description

Option	Description
This command has no keywords or options	

Default

None

Mode

Gateway ISoIP

Command Usage

This command enables or disables the ISoIP gateway.

Warning: Any ongoing calls on the ISoIP gateway will be closed immediately, if the gateway is stopped using the ‘shutdown’ command.

Example

The following example stops the ISoIP gateway:

```
    SN(gw-isoip)[isoip]#shutdown
```

The next example starts the ISoIP gateway:

```
    SN(gw-isoip)[isoip]#no shutdown
```

Related Commands

None

use voip-profile

use voip-profile <*profile_name*>

Function

Link ISoIP gateway to a VoIP profile

Syntax Description

Option	Description
<*profile_name*>	Name of the VoIP profile

Default

The VoIP profile named *default* is linked to the ISoIP gateway.

Mode

Gateway ISoIP

Command Usage

All parameters that define a voice over ip connection from the bearer channel point of view, are collected in voip-profiles (see mode ‘profile voip’). Several of these profiles can be defined in parallel. This command tells the ISoIP gateway, from which profile it should take the parameters to open the bearer channel over IP.

Note: The settings of the profile linked here can be selectively overwritten in the ISoIP interfaces. For more information refer to Chapter 19, “Interface ISoIP Mode”.

Example

The following example links the voip-profile named *lowRate* to the ISoIP gateway.

```
SN(gw-isoip)[isoip]#use voip-profile lowRate
```

Related Commands

Command	Description
interface isoip	Enter ISoIP interface configuration mode
profile voip	Enter VoIP profile mode

22 PORT ETHERNET MODE

22.1 Command Overview

In this mode you may configure a SmartNode's Ethernet ports. In SmartWare Ethernet ports represent the physical connectors on the SmartNode hardware. Since ports are closely-knit with the physical structure of a SmartNode, they cannot be created but have to be configured. The configuration of a port includes parameters for the physical and data link layer such as framing and encapsulation formats or media access control. Before any higher-layer user data can flow through a physical port, you must associate that port with an interface within the IP context. This association is referred to as a binding. To configure an Ethernet port the port Ethernet mode is used.

The commands that are available in this mode are listed in Table 22-1 below:

Command	Description
bind interface	Bind ethernet port to IP interface
cos	Define the layer 2 CoS to service class mapping
encapsulation	Configure the Ethernet encapsulation type
frame-format	Define the format to send IEEE 801 or IEEE 802.1 Q frames
medium	Configure the medium
port ethernet	Enter ethernet port configuration mode
shutdown	Enable or disable an Ethernet port
vlan	Join VLAN group

Table 22-1: Commands available in Port Ethernet Mode

bind interface

[no] bind interface <*ip_interface_name*> **[router]**

Function

Bind ethernet port to IP interface

Syntax Description

Option	Description
interface	Bind ethernet port to IP interface
<*ip_interface_name*>	IP interface name
router	IP context name. If not declared, the default context router will be taken automatically

Default

None

Mode

Port Ethernet

Command Usage

Before it is possible to send data over a link layer circuit, the bind command is required. It connects the port to the selected ip interface, which must be preceded created, and the right encapsulation type must be set.

After the port is bound to an ip interface, the **no shutdown** command must be executed for enabling data processing.

The **bind** command used with the **no** prefix removes the current binding between the port and the ip interface. Use of the command in this form does not require the declaration of the interface name.

Example

The following example configures an ethernet port for ip encapsulation and binds it to an ip interface:

```
SN(cfg)#port ethernet 0 0
SN(prt-eth)[0/0]#encapsulation ip
SN(prt-eth)[0/0]#bind interface eth0 router
SN(prt-eth)[0/0]#no shutdown
```

The following example removes an existing binding between a port and an ip interface:

```
SN(prt-eth)[0/0]#no bind interface
```

Related Commands

Command	Description

encapsulation	Configures the encapsulation type on this circuit
[no] shutdown	Enable or disable of a port
show port ethernet	Dispalys the current port configuration and state
show ip interface	Dispalys the current interface configuration and state

cos

cos { (default *<default>* **) | (rx-map** *<cos>* **as** *<service>* **) | (tx-map** *<service>* **as** *<cos>* **) }**

Function

Define the layer 2 CoS to service class mapping

Syntax Description

Option	Description
default	Default service class when no layer 2 CoS present
<default>	Service class value
rx-map	Receive mapping table - layer 2 CoS to svc class
<cos>	Layer 2 class of service value
as	Maps layer 2 CoS to service class
<service>	Service class value
tx-map	Transmit mapping table - svc class to layer 2 CoS
<service>	Service class value
as	Maps service class to layer 2 CoS
<cos>	Layer 2 class of service value

Default

None

Mode

Port Ethernet

Command Usage

To enable real-time and delay sensitive services such as VoIP traffic to be transported across the network, the SmartWare application software supports the delivery of Quality of Service (QoS) information in the ToS (Type of Service) field. To define the Class of Service (CoS) to service class mapping the cos command is used, with one of the following arguments:

- **default** Default service class when no Layer 2 CoS present
- **rx-map** Receive mapping table - Layer 2 CoS to service class mapping
- **tx-map** Transmit mapping table - Service class to Layer 2 CoS mapping

The **cos rx-map** and **cos tx-map** commands above need service class mapping table entries, which has to be entered as additional command argument. The command syntax is:

- **cos rx-map** layer 2 class of service value as service class value
- **cos tx-map** service class value as layer 2 class of service value

Configuring the class of service map has to be done thus:

1. Configure the class of service map table for the outgoing data traffic. Every provided service can be mapped to a Class of Service.
2. Configure the class of service map table for the incoming data traffic. Every received Class of Service can be assigned to a service type

Example

The following example shows how to add a receive mapping table entry, which converts a layer 2 class of service value of 2 into a service class value of 4 for the Ethernet port on slot 0 and port 0 of a SmartNode:

```
SN(cfg)#port ethernet 0 0
SN(prt-eth)[0/0]#cos rx-map 2 as 4
```

Related Commands

None

encapsulation

encapsulation { ip }

Function

Configure the Ethernet encapsulation type

Syntax Description

Option	Description
ip	IP ethernet encapsulation

Default

None

Mode

Port Ethernet

Command Usage

This command is used to set the encapsulation type to be used on the port ethernet. Before the port can be bound to an interface, the encapsulation type must be specified.

Example

The following example configures an ethernet port for ip encapsulation and binds it to an ip interface:

```
SN(cfg)#port ethernet 0 0
SN(prt-eth)[0/0]#encapsulation ip
SN(prt-eth)[0/0]#bind interface eth0 router
SN(prt-eth)[0/0]#no shutdown
```

Related Commands

Command	Description
bind interface	Binds the port to an interface
shutdown	Enable or disable of a port
show port ethernet	Dispalys the current port configuration and state

frame-format

frame-format { standard | dot1q }

Function

Define the format to send IEEE 801 or IEEE 802.1 Q frames

Syntax Description

Option	Description
standard	Sends standard IEEE 802.3 Ethernet frames
dot1q	Sends VLAN-tagged IEEE 802.1 Q frames

Default

By default the frame format is set to standard, representing IEEE 802.3.

Mode

Port Ethernet

Command Usage

The frame format defines the logical grouping of information sent as a data link layer unit over a transmission medium. Depending on the components receiving data sent from a SmartNode via an Ethernet connection the frame format has to be specified. The command **frame-format** allows you to set the sending either of IEEE 802.3 or IEEE 802.1 Q frames. Supported command options are:

• dot1q	Sends VLAN-tagged IEEE 802.1 Q frames used for virtual LANs
• standard	Sends standard IEEE 802.3 Ethernet frames

Example

The following example shows how to bind the Ethernet port on slot 0 and port 0 of a SmartNode to send tagged IEEE 802.1Q frames:

```
SN(cfg)#port ethernet 0 0
SN(prt-eth)[0/0]#frame-format dot1q
```

Related Commands

None

medium

medium { auto | ({10 | 100 } { half | full }) }

Function

Configure the medium

Syntax Description

Option	Description
auto	Automatic medium detection
10	10 Mbit/s
100	100 Mbit/s
half	Half Duplex
full	Full Duplex

Default

The medium is defined to 10 Mbit/s and half duplex as default.

Mode

Port Ethernet

Command Usage

In *auto* mode the device should detect whether it is connected to a 10 or 100 Mbit/s network and if it is half or full duplex capable.

It is possible to force the system to go in a special mode by configuring an explicit speed rate and duplex mode. Link establishing the can fail, if the configuration is different from the capability of the connected ethernet segment.

This command is executable on the fly, so the port must no be shutdown for changing this parameter.

Example

The following example configures an Ethernet port for a 10MBit/s half duplex network segment:

```
SN(cfg)#port ethernet 0 0
SN(prt-eth)[0/0]#medium 10 half
```

Related Commands

Command	Description
show port ethernet	Dispalys the current port configuration and state

port ethernet

port ethernet *<slot> <port>*

Function

Enter ethernet port configuration mode

Syntax Description

Option	Description
ethernet	Enter Ethernet port configuration mode
<slot>	Ethernet slot number
<port>	Ethernet port number

Default

None

Mode

Configure

Command Usage

Enter ethernet port configuration mode

Example

The following example enters configuration mode for port ethernet 0 0:

```
SN(cfg)#port ethernet 0 0
SN(prt-eth)[0/0]#
```

Related Commands

Command	Description
Configure	Entering configuration mode

shutdown

[no] shutdown

Function

Enable or disable an Ethernet port

Syntax Description

Option	Description
This command has no keywords or options	

Default

None

Mode

Port Ethernet

Command Usage

Enable or disable the specified port for data processing. If the port is shutdown, nothing will be printed out in the running configuration.

Warning: The port cannot be enabled (**no shutdown**) as long as no valid binding is configured.

Example

The following example configures the port with a valid binding and enables it for data processing:

```
SN(cfg)#port ethernet 0 0
SN(prt-eth)[0/0]#encapsulation ip
SN(prt-eth)[0/0]#bind interface eth0 router
SN(prt-eth)[0/0]#no shutdown
```

The following example disables the port for data processing:

```
SN(prt-eth)[0/0]#shutdown
```

Related Commands

Command	Description
bind interface	Binds the port to an interface
show port ethernet	Dispalys the current port configuration and state

vlan

[no] vlan [*<vlan_id>* **]**

Function

Join VLAN group (when frame-format is 1dotq)

Syntax Description

Option	Description
<vlan_id>	VLAN group to join

Default

The VLAN ID is set to 1 by default.

Mode

Port Ethernet

Command Usage

Virtual LANs (VLANs) offer significant benefits in terms of efficient use of bandwidth, flexibility, performance, and security. VLAN technology functions by logically segmenting the network into different broadcast domains so that packets are only switched between ports that are designated for the same VLAN. Thus, by containing traffic originating on a particular LAN only to other LANs within the same VLAN, switched virtual networks avoid wasting bandwidth, a drawback inherent in traditional bridged/switched networks where packets are often forwarded to LANs that do not require them.

When the IEEE 802.10 protocol is used to effect a VLAN topology, VLAN ID is the essential piece of required header information. The 802.10 SAID field is used as the VLAN ID. This field identifies traffic as belonging to a particular VLAN. Internetworking devices with VLAN intelligence can then make forwarding decisions based upon which ports are configured for which VLANs. Therefore, where the goal is to establish logical VLAN topologies across a physical network (rather than encrypting the actual data and thereby incurring performance reduction caused by applying security algorithms), high-throughput devices must minimally support only the Clear Header portion of the 802.10 packet format.

Example

The following example shows how to join the VLAN group with an ID of 5 on the Ethernet port on slot 0 and port 0 of a SmartNode:

```
SN(cfg)#port ethernet 0 0
SN(prt-eth)[0/0]#vlan 5
```

Related Commands

None

23 PORT SERIAL MODE

23.1 Command Overview

In this mode you may configure a SmartNode's serial ports. In SmartWare serial ports represent the physical connectors on the SmartNode hardware. Since ports are closely-knit with the physical structure of a SmartNode, they cannot be created but have to be configured. The configuration of a port includes parameters for the physical and data link layer such as framing and encapsulation formats or media access control. Before any higher-layer user data can flow through a physical port, you must associate that port with an interface within the IP context. This association is referred to as a binding. To configure a serial port the port serial mode is used.

The commands that are available in this mode are listed in Table 23-1 below:

Command	Description
encapsulation	Configure the serial encapsulation type
hardware-port	Configure the hardware port type or physical link interface
port serial	Enter the serial port configuration mode
shutdown	Enable or disable the selected port
transmit-data-on-edge	Specifies the clock edge on which data has to be sent

Table 23-1: Commands available in Port Serial Mode

encapsulation

encapsulation { framerelay }

Function

Configure the serial encapsulation type

Syntax Description

Option	Description
framerelay	Select Frame Relay serial encapsulation

Default

None

Mode

Port Serial

Command Usage

This command is used to set the encapsulation type has to be active on the port serial. As soon as this command is executed, the configuration mode for the next encapsulation level is available.

Example

The following example configures framerelay encapsulation for port serial 0 0:

```
SN(cfg)#port serial 0 0
SN(prt-ser)[0/0]#encapsulation framerelay
```

Related Commands

Command	Description
port serial	Port serial entering command
show port serial	Displays the current configuration and state

hardware-port

hardware-port { v35 | x21 }

Function

Configure the hardware port type or physical link interface

Syntax Description

Option	Description
v35	Configures a V.35[1] compatible interface
x21	Configures a X.21[2] (or V.11) compatible protocol

Default

If not explicitly specified a V.35 compatible interface is selected by default.

Mode

Port Serial

Command Usage

The hardware connector supports both the physical layer interface V.35 and the protocol X.21. This command is used to select the suitable hardware port protocol mode and is executable on the fly, so the port must no be shutdown for changing this parameter.

Example

The following example configures the physical layer as X.21:

```
SN(cfg)#port serial 0 0
SN(prt-ser)[0/0]#hardware-port x21
```

Related Commands

Command	Description
port serial	Port serial entering command
show port serial	Displays the current configuration and state

[1] V.35 defined by CCITT standard V.28, V.35, ISO 2593. V.35 is a partially balanced, partially single-ended interface specification. The data leads and clock leads are balanced, the handshake leads are single-ended. Most commonly used for 56kbps and 64kbps data rates.

[2] X.21/V.11 defined by CCITT standard V.11, X.21, ISO 4903. The X.21 interface was recommended by the CCITT in 1976. It is defined as a digital signalling interface between customers (DTE) equipment and carrier's equipment (DCE). And thus primarally used for telecom equipment.

port serial

port serial *<slot> <port>*

Function

Enter the serial port configuration mode

Syntax Description

Option	Description
<slot>	Serial slot number
<port>	Serial port number

Default

None

Mode

Port Serial

Command Usage

Selects the serial interface on specified slot and port.

Example

The following example enters configuration mode for the serial interface on slot 0 and port 0:

```
SN(cfg)#port serial 0 0
SN(prt-ser)[0/0]#
```

Related Commands

Command	Description
configure	Entering configuration mode

shutdown

[no] shutdown

Function

Enable or disable the selected port

Syntax Description

Option	Description
This command has no keywords or options	

Default

None

Mode

Port Serial

Command Usage

Enable or disable the specified port for data processing. If the port is shutdown, nothing will be printed out in the running configuration.

Example

The following example enables the port serial for data processing:

```
SN(cfg)#port serial 0 0
SN(prt-ser)[0/0]#no shutdown
```

Related Commands

Command	Description
configure	Entering configuration mode

transmit-data-on-edge

transmit-data-on-edge { positive | negative }

Function

SmartWare allows defining the received clock edge on which data shall be transmitted over the serial interface from a SmartNode to a peripheral device. The command transmit-data-on-edge, offers the options positive or negative for this purpose.

Syntax Description

Option	Description
positive	Rising edge
negative	Falling edge

Default

As default the positive edge is used if nothing is specified.

Mode

Port Serial

Command Usage

Use the **transmit-data-on-edge** port serial configuration command for change the clock edge on which the data has to be transmitted. On default the data will be transmitted on positive edge, which should work for the most network environments. If the delay between clock signal received from the DCE device and the data transmission is too long, errors can be appeared. Changing of the clock edge to **negative** might correct this problem.

Change the clock edge for high-speed networks or if the connected DCE device generates a floating clock for reach the configured transmission rate. This command is executable on the fly, so the port must no be shutdown for change this parameter.

Example

The following example shows how to define that data shall be transmitted on the negative received clock edge on the serial interface on slot 0 and port 0 of a SmartNode.

```
SN(cfg)#port serial 0 0
SN(prt-ser)[0/0]#transmit-data-on-edge negative
```

Related Commands

Command	Description
configure	Entering configuration mode
hardware-port	Configures the physical interface

24 FRAME RELAY MODE

24.1 Command Overview

In this mode you may configure Frame Relay on the serial interface of a SmartNode 2300. Frame Relay is a high-performance WAN protocol that operates at the physical and data link layers of the OSI reference model. Frame Relay originally was designed for use across Integrated Services Digital Network (ISDN) interfaces. Today, it is used over a variety of other network interfaces, like serial interfaces as well. To configure Frame Relay on the serial interface use the Frame Relay mode.

The commands that are available in this mode are listed in Table 24-1 below:

Command	Description
framerelay	Enter Frame Relay configuration mode
keepalive	Set the keepalive interval or disable keepalive
lmi-type	Set the Local Management Interface (LMI) type

Table 24-1: Commands available in Frame Relay Mode

framerelay

framerelay

Function

Enter Frame Relay configuration mode

Syntax Description

Option	Description
This command has no keywords or options	

Default

None

Mode

Frame Relay

Command Usage

This command is only executable if a lower link layer circuit has Frame Relay configured as its encapsulation type.

Example

The following example configures framerelay encapsulation on port serial and enters framerelay configuration mode:

```
SN(prt-ser)[0/0]#encapsulation framerelay
SN(prt-ser)[0/0]#framerelay
SN(frm-rel)[0/0]#
```

Related Commands

Command	Description
encapsulation	Specifies encapsulation type
show framerelay	Displays framerelay and pvc informations

keepalive

[no] keepalive [*<keepalive>* **]**

Function

Set the keepalive interval or disable keepalive

Syntax Description

Option	**Description**
<keepalive>	keepalive interval in seconds

Default

The default keepalive interval is 10 seconds.

Mode

Frame Relay

Command Usage

Configures the interval between transmissions of keepalive messages. The currently defined **lmi-type** will be taken for the message format.
The command used with the **no** prefix stops sending of keepalive messages.

Example

The following example starts sending of keepalive messages with the period of 20 seconds:

```
SN(frm-rel)[0/0]#keepalive 20
```

Related Commands

Command	**Description**
lmi-type	Set the Local Management Interface (LMI) type
show framerelay	Displays current configuration and state

lmi-type

lmi-type { ansi | gof | itu }

Function

Set the Local Management Interface (LMI) type

Syntax Description

Option	Description
ansi	Configures LMI type as ansi for ANSI T1.617 Annex D
gof	Configures LMI type as gof for “Group of 4”, which is the default for Cisco LMI
itu	Configures LMI type as itu for ITU-T Q.933 Annex A.

Default

The default LMI type is itu.

Mode

Frame Relay

Command Usage

For a frame relay network, the line protocol is the periodic exchange of local management interface (LMI) packets between the SmartNode and the frame relay provider equipment. If the SmartNode is attached to a public data network (PDN), the LMI type must match the type used on the public network. You can set one of the following three types of LMIs on SmartNode:

- ansi for ANSI T1.617 Annex D,
- gof for “Group of 4”, which is the default for Cisco LMI, and
- itu for ITU-T Q.933 Annex A.

Example

The following example sets the LMI type to ANSI T1.617 Annex D for Frame Relay over the serial interface on slot 0 and port 0 of a SmartNode 2300:

```
SN(cfg)#port serial 0 0
SN(prt-ser)[0/0]#framerelay
SN(frm-rel)[0/0]#lmi-type ansi
```

Related Commands

Command	Description
keepalive	Set the keepalive interval or disable keepalive
show framerelay	Displays current configuration and state

25 PVC MODE

25.1 Command Overview

In this mode you may configure permanent virtual circuits (PVCs). PVCs are permanently established connections that are used for frequent and consistent data transfers between devices across the Frame Relay network. PVCs save bandwidth associated with circuit establishment and tear down in situations where certain virtual circuits must exist all the time. The Frame Relay network provides a number of virtual circuits that form the basis for connections between stations attached to the same Frame Relay network. To configure PVCs use the PVC mode.

The commands that are available in this mode are listed in Table 25-1 below:

Command	Description
bind interface	Bind Frame Relay PVC DLCI to the IP interface within IP context router
encapsulation	Set the encapsulation type to comply with RFC 1490
pvc	Enter the PVC configuration mode and assign a DLCI number
shutdown	Disable a Frame Relay PVC DLCI on the serial interface

Table 25-1: Commands available in PVC Mode

bind interface

[no] bind interface <*ip_interface_name*> **[router]**

Function

Bind Frame Relay PVC DLCI to the IP interface within IP context router

Syntax Description

Option	Description
interface	Bind Frame Relay PVC DLCI to IP interface
<*ip_interface_name*>	IP interface name
router	IP context name

Default

None

Mode

PVC

Command Usage

Before it is possible to send data over a link layer circuit, the bind command is required. It connects the PVC to the selected IP interface, which must be preceded created, and the right encapsulation type must be set.
After the PVC is bound to an IP interface, the **no shutdown** command must be executed for enabling data processing.
The **bind** command used with the **no** prefix removes the current binding between the PVC and the interface. Use of the command in this form does not require the declaration of the interface name.

Example

The following example binds the Frame Relay PVC 1 to the IP interface wan of IP context router to the serial interface on slot 0 and port 0 of a SmartNode 2300:

```
SN(cfg)#port serial 0 0
SN(prt-ser)[0/0]#framerelay
SN(frm-rel)[0/0]#pvc 1
SN(pvc)[1]#bind interface wan router
```

The following example removes an existing binding between PVC 1 and the related IP interface wan:

```
SN(pvc)[1]#no bind interface
```

Related Commands

Command	Description

encapsulation	Configures the encapsulation type on this circuit
[no] shutdown	Enable or disable a port
show framerelay	Displays Frame Relay and PVC informations

encapsulation

encapsulation { rfc1490 }

Function

Set the encapsulation type to comply with RFC 1490

Syntax Description

Option	Description
rfc1490	IP over Frame Relay encapsulation

Default

None

Mode

PVC

Command Usage

This command is used to set the encapsulation type to be used on the PVC. To set the encapsulation type to comply with the Internet Engineering Task Force (IETF) standard (RFC 1490) the PVC configuration command encapsulation RFC 1490 has to be used. Use this keyword when connecting to another vendor's equipment across a Frame Relay network.

Note: Before the PVC can be bound to an IP interface, the encapsulation type must be specified. RFC 1490 is specified for multi-protocol interconnection over Frame Relay. SmartWare Release 2.00 supports only RFC 1490 IP encapsulation.

Example

The following example configures a PVC 1 for RFC 1490 encapsulation and binds it to the IP interface *wan*:

```
SN(frm-rel)[0/0]#pvc 1
SN(pvc)[1]#encapsulation rfc1490
SN(pvc)[1]#bind interface wan router
SN(pvc)[1]#no shutdown
```

Related Commands

Command	Description
bind interface	Bind a PVC to an IP interface
shutdown	Enable or disable a PVC
show framerelay	Displays Frame Relay and PVC informations

pvc

[no] pvc <dlci>

Function

Enter the PVC configuration mode and assign a DLCI number to be used on the specified sub interface

Syntax Description

Option	Description
<*dlci*>	DLCI number

Default

None

Mode

PVC

Command Usage

If the Permanent Virtual Circuit (PVC) with the specified Data Link Connection Identifier (DLCI) does not exist, a new PVC will be created. The DLCI is the unique identifier of a PVC. For changing parameters of a certain PVC, entering configuration mode by using the DLCI of this PVC. The command PVC allows values for DLCI numbers in the range from 1 to 1022.

Use the command with the **no** prefix removes the current binding and deletes the PVC.

Note: The DLCIs 0 and 1023 are reserved for the Local Management Interface (LMI) and should not be used.

Example

The following example enters the configuration mode for PVC with the assigned DLCI of 1 for Frame Relay over the serial interface on slot 0 and port 0 of a SmartNode 2300:

```
SN(cfg)#port serial 0 0
SN(prt-ser)[0/0]#framerelay
SN(frm-rel)[0/0]#pvc 1
SN(pvc)[1]#
```

Related Commands

Command	Description
encapsulation	Configures the encapsulation type on this circuit
bind interface	Bind a PVC to an IP interface
shutdown	Enable or disable a PVC

show framerelay	Displays Frame Relay and PVC informations

shutdown

[no] shutdown

Function

Disable a Frame Relay PVC DLCI on the serial interface

Syntax Description

Option	Description
This command has no keywords or options	

Default

None

Mode

PVC

Command Usage

Frame Relay PVCs can be disabled whenever it is necessary. Be aware that disabling specific PVCs also disables the related serial interface and vice versa.

Note: The PVC cannot be enabled (**no shutdown**) as long as no valid binding is configured.

Example

The following example configures the PVC 1 with a valid binding and enables it for data processing:

```
    SN(pvc)[1]#encapsulation rfc1490
    SN(pvc)[1]#bind interface wan router
    SN(pvc)[1]#no shutdown
```

Related Commands

Command	Description
encapsulation	Configures the encapsulation type on this circuit
bind interface	Bind a PVC to an ip interface
show framerelay	Displays Frame Relay and PVC informations

26 PORT ISDN MODE

26.1 Command Overview

In this mode you may configure a SmartNode's ISDN ports. ISDN ports represent physical ports on the SmartNode. The configuration of the ISDN ports depends on the port type, and on the connected voice device. There are two types of ISDN ports:

- ISDN basic rate interface (BRI), and
- ISDN primary rate interface (PRI).

A BRI port supports two 64kbit/s B-channels for switched voice or data connections, one 16kbit/s D-channel for signaling and always-on data transfer. BRI ports are sometimes called S0 ports. The related PSTN access service is also called Basic Rate Access (BRA).

The PRI port supports thirty 64kbit/s B-channels, one 64kbit/s D-channel and a synchronization timeslot on a standard E1 (G.704) physical layer. PRI ports are also called S2m ports. The related PSTN access service is also called Primary Rate Access (PRA).

To configure an ISDN port the port ISDN mode is used. The commands that are available in this mode are listed in Table 26-1 below:

Command	Description
channel-hunting	Define the bearer channel selection strategy (PRI only)
channel-numbering	Define the bearer channel numbering rule
channel-range	Define the allowed bearer channel range (PRI only)
clock-mode	Define the layer 1 clocking mode (PRI only)
down	Disable a port
l2proto	Define layer 2 protocol to be used for signaling (DSS1 only)
l3proto	Define layer 3 protocol to be used for signaling
loop	Enable or disable bearer channel loops
max-channels	Define maximum number of concurrently allowed bearer channels (PRI only)
port isdn	Enter ISDN port configuration mode
smart-disconnect	Define smart-disconnect cause values
uni-side	Define the port mode
up	Enable a port

Table 26-1: Commands available Port ISDN Mode

channel-hunting

channel-hunting { up | down | up-cyclic | down-cyclic }

Function

Define the bearer channel selection strategy (PRI only)

Syntax Description

Option	**Description**
up	Select lowest available
down	Select highest available
up-cyclic	Select lowest available after last selected
down-cyclic	Select highest available after last selected

Default

The default of this setting is hardware dependant. Use 'show running-config' to see your default value.

Mode

Port ISDN

Command Usage

Defines the bearer-channel allocation strategy to be used on primary rate ISDN ports.

Example

The following example always uses the lowest available channel:

```
    SN(prt-isdn)[0/0]#channel-hunting up
```

Related Commands

None

channel-numbering

channel-numbering { etsi | pss1-old }

Function

Define the bearer channel numbering rule

Syntax Description

Option	Description
etsi	DSS1 and newer PSS1 rule
pss1-old	Old PSS1 rule

Default

The default is ETSI channel numbering.

Mode

Port ISDN

Command Usage

Defines how the bearer-channels shall be numbered in the ISDN signalling. Normally the setting 'etsi' is used. In this case the bearer-channel number corresponds to the timeslot number in the G.703 framing. The channels are numbered 1 to 31. However the channel 16 is not used. If 'pss1-old' is specified, the channels are numbered 1 to 30.

Warning: If this setting is not configured properly, you will have calls without or the wrong voice channels connected.

Example

The following example sets the channel numbering to the commonly used *etsi* rule

```
SN(prt-isdn)[0/0]#channel-numbering etsi
```

The next example sets the channel numbering to the rarely used *pss1-old* rule:

```
SN(prt-isdn)[0/0]#channel-numbering pss1-old
```

Related Commands

None

channel-range

[no] channel-range *<low>* *<high>*

Function

Define the allowed bearer channel range (PRI only)

Syntax Description

Option	Description
<low>	Lowest allowed bearer channel number
<high>	Highest allowed bearer channel number

Default

The default is not to limit the allowed channel-range.

Mode

Port ISDN

Command Usage

The channel-range can be used on the primary rate ports to limit the bearer-channels allowed for use to a specific range.

Example

The following example allows only bearer-channels 1 to 10 to be used:

```
SN(prt-isdn)[0/0]#channel-range 1 10
```

The next example disables the channel-range limitation:

```
SN(prt-isdn)[0/0]#no channel-range
```

Related Commands

Command	Description
max-channels	Defines the maximum number of concurrent calls allowed on the interface

clock-mode

clock-mode { master | slave }

Function

Define the layer 1 clocking mode (PRI only)

Syntax Description

Option	Description
master	Generates clock
slave	Synchronizes to incoming clock

Default

The default of this setting is hardware dependant. Use 'show running-config' to see your default value.

Mode

Port ISDN

Command Usage

On the primary rate port this setting defines, if the transmitting clock for the port shall be recovered from the receive clock (slave), or if the systems internal clock shall be used for transmitting (master). If the port is configured as slave, the recovered clock can also be used as the 'clock-source' for the entire ISDN subsystem.

On basic rate ports, this command has no effect. Instead the clocking mode is derived from the 'uni-side' setting.

Warning: If this setting is not configured properly, you may experience frame slips on the primary rate port.

Example

The following example sets the clock mode to slave:

```
SN(prt-isdn)[0/0]#clock-mode slave
```

Related Commands

Command	Description
clock-source	Defines the clock source for the systems ISDN subsystem.
uni-side	Selects user- and network-side configuration

down

[no] down

Function

Disable a port

Syntax Description

Option	Description
This command has no keywords or options	

Default

None

Mode

Port ISDN

Command Usage

This command is used to disable an ISDN port. If you need to reconfigure an ISDN port, you need first to disable it using this command.

Warning: All active calls on the ISDN port will immediately be terminated when using this command.

Example

The following example disables an ISDN port:

```
SN(prt-isdn)[0/0]#down
```

Related Commands

Command	Description
up	Enables an ISDN port

l2proto

l2proto { pp | pmp }

Function

Define layer 2 protocol to be used for signaling (DSS1 only)

Syntax Description

Option	Description
pp	Point to point
pmp	Point to multipoint

Default

The default of this setting is hardware dependant. Use 'show running-config' to see your default value.

Mode

Port ISDN

Command Usage

Defines the ISDN layer two protocol to be used. This may either be point-to-point, which is normally used in combination with PBXs, or point-to-multipoint, which is normally used, multiple terminals are directly connected to the ISDN bus.

Warning: The primary rate ports only support the point-to-point protocol.

Example

The following example sets the layer 2 protocol to poin-to-point:

```
    SN(prt-isdn)[0/0]#l2proto pp
```

The next example sets the layer 2 protocol to poin-to-point:

```
    SN(prt-isdn)[0/0]#l2proto pmp
```

Related Commands

Command	Description
l3proto	Selects the layer 3 protocol to be used.

l3proto

l3proto { dss1 | pss1 }

Function

Define layer 3 protocol to be used for signaling

Syntax Description

Option	Description
dss1	DSS1 protocol
pss1	PSS1 protocol (QSIG)

Default

None

Mode

Port ISDN

Command Usage

Defines the ISDN layer 3 protocol to be used on the ISDN port.

Example

The following example selects the PSS1 or QSIG protocol:

```
SN(prt-isdn)[0/0]#l3proto pss1
```

The next example selects the DSS1 protocol:

```
SN(prt-isdn)[0/0]#l3proto dss1
```

Related Commands

Command	Description
l2proto	Defines the ISDN layer 2 protocol
uni-side	Selects user-/network-side configuration

loop

[no] loop <*channel*>

Function

Enable or disable bearer channel loops

Syntax Description

Option	Description
<*channel*>	ISDN bearer channel number

Default

All loops are disabled by default.

Mode

Port ISDN

Command Usage

Enables or disables the bearer-channel loop on a specific channel. These loops are only used for testing and shall not be enabled during normal operation. An active loop causes all data received on the bearer-channel to be immediately transmitted back to the sender. On primary rate ports, the channel number to be specified is the timeslot number in the G.703 frame. On the basic rate ports, the channel number may be either 0 or 1.

Warning: Configuration of active loops does not appear in the 'running-config' and must therefore be activated again manually, if the system is rebooted.

Example

The following example enables the loop on bearer channel 20:

```
SN(prt-isdn)[0/0]#loop 20
```

The next example disables the loop on channel 20:

```
SN(prt-isdn)[0/0]#no loop 20
```

Related Commands

None

max-channels

[no] max-channels <*channels*>

Function

Define maximum number of concurrently allowed bearer channels (PRI only)

Syntax Description

Option	Description
<*channels*>	Number of bearer channels

Default

The number of concurrent calls is not limited by default.

Mode

Port ISDN

Command Usage

The command limits the concurrent number of calls allowed at any time to the specified number.

Example

The following example limits the number of concurrent calls to 10:

```
SN(prt-isdn)[0/0]#max-channels 10
```

The next example removes the limitation:

```
SN(prt-isdn)[0/0]#no max-channels
```

Related Commands

Command	Description
channel-range	Defines a range of allowed bearer-channel numbers

port isdn

port isdn <*slot*> <*port*>

Function

Enter ISDN port configuration mode

Syntax Description

Option	**Description**
isdn	Enter ISDN port configuration mode
<*slot*>	Slot number
<*port*>	Port number

Default

None

Mode

Port ISDN

Command Usage

Enters configuration mode for the specified ISDN port.

Example

The following example enters configuration mode for ISDN port 0 on slot 0:

```
SN(cfg)#port isdn 0 0
SN(prt-isdn)[0/0]#
```

Related Commands

None

smart-disconnect

[no] smart-disconnect { from-isdn-calls | to-isdn-calls }

Function

Define smart-disconnect cause values

Syntax Description

Option	Description
from-isdn-calls	Add cause value for calls from ISDN ('all' means all cause values)
to-isdn-calls	Add cause value for calls to ISDN ('all' means all cause values)

Default

The smart-disconnect feature is disabled per default.

Mode

Port ISDN

Command Usage

The command is used to enable the smart-disconnect feature on the ISDN port. If this feature is enabled, the ISDN port will itself respond to any Q.931 disconnect message received by sending a Q.931 Release message back. This causes a disconnected call to be terminated immediately without providing busy tone to the IP network after the call has been terminated from the ISDN network. The feature can be enabled for calls from and to the ISDN network separately.

Warning: If enabled some in-band announcements from the ISDN network may not be heard by terminals on the IP network

Example

The following example enables the smart-disconnect feature for calls from the ISDN network:

```
SN(prt-isdn)[0/0]#smart-disconnect from-isdn-calls
```

The next example disables the smart-disconnect feature for calls to the ISDN network:

```
SN(prt-isdn)[0/0]#no smart-disconnect to-isdn-calls
```

Related Commands

None

uni-side

uni-side { net | usr }

Function

Define the port mode

Syntax Description

Option	Description
net	Network side (DSS1) / Layer 2 master (PSS1)
usr	User side (DSS1) / Layer 2 slave (PSS1)

Default

None

Mode

Port ISDN

Command Usage

The command is used to define the side of the ISDN port in an asymmetric signalling protocol like DSS1. A port, which is connected to a switch of the public network, should usually be configured as *usr*. If the port is however used to connect terminals, *net* is usually the correct setting.

The setting also defines the master- or slave-configuration of the layer 2 protocol, therefore this setting must also be defined when using symmetric layer 3 protocols like PSS1. If *usr* is specified, the layer 2 will act as slave, while it will act as master, if the *uni-side* is set to *net*.

On basic rate ports, this setting is also used to derive the clocking-mode for the port. If the *uni-side* is set to *net*, the port will transmit with the ISDN subsystems internal clock. If the *uni-side* is set to *usr* the port will recover its transmit clock from the ISDN signal received from the remote side.

Example

The following example sets the port mode to net for Network side (DSS1) asymmetric signalling:

```
SN(prt-isdn)[0/0]#uni-side net
```

The next example sets the port mode to net for User side (DSS1) asymmetric signalling:

```
SN(prt-isdn)[0/0]#uni-side usr
```

Related Commands

None

up

[no] up

Function

Enable a port

Syntax Description

Option	Description
This command has no keywords or options	

Default

None

Mode

Port ISDN

Command Usage

This command is used to enable an ISDN port, which has previously been disabled using the **down** command for configuration.

Example

The following example enables an ISDN port:

```
SN(prt-isdn)[0/0]#up
```

Related Commands

Command	Description
down	Disables an ISDN port

APPENDIX A

Configuration Mode Overview

Figure iii illustrates the configuration modes hierarchy. Each box contains the mode name, the enter command and the prompt in a telnet console. Additionally all relationships between the instances of the components through bind and link commands are illustrated. For example an instance of 'port ethernet' must be bound to an 'IP interface' through the command '[no] bind interface <name> [<ip_context>]'.

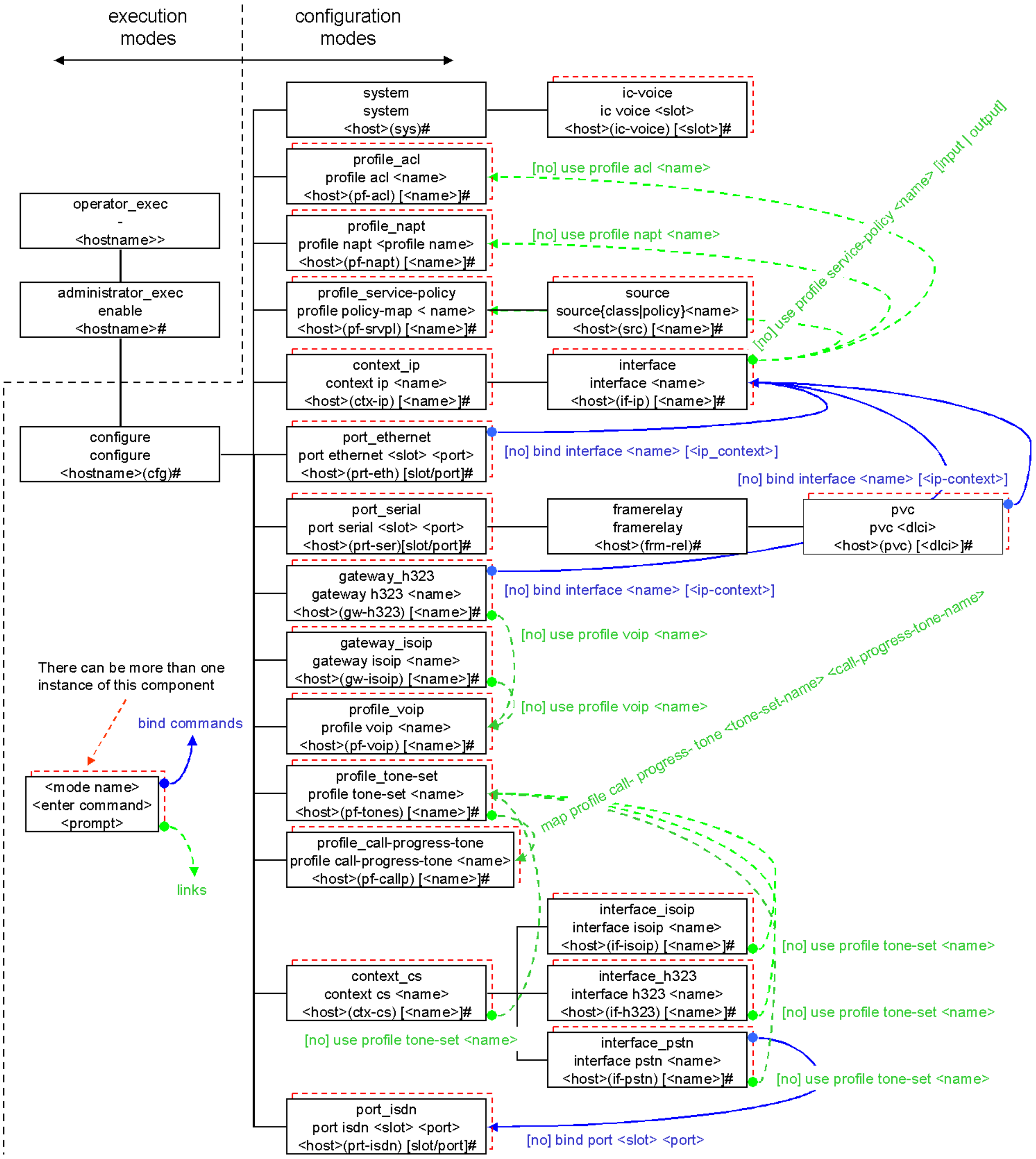
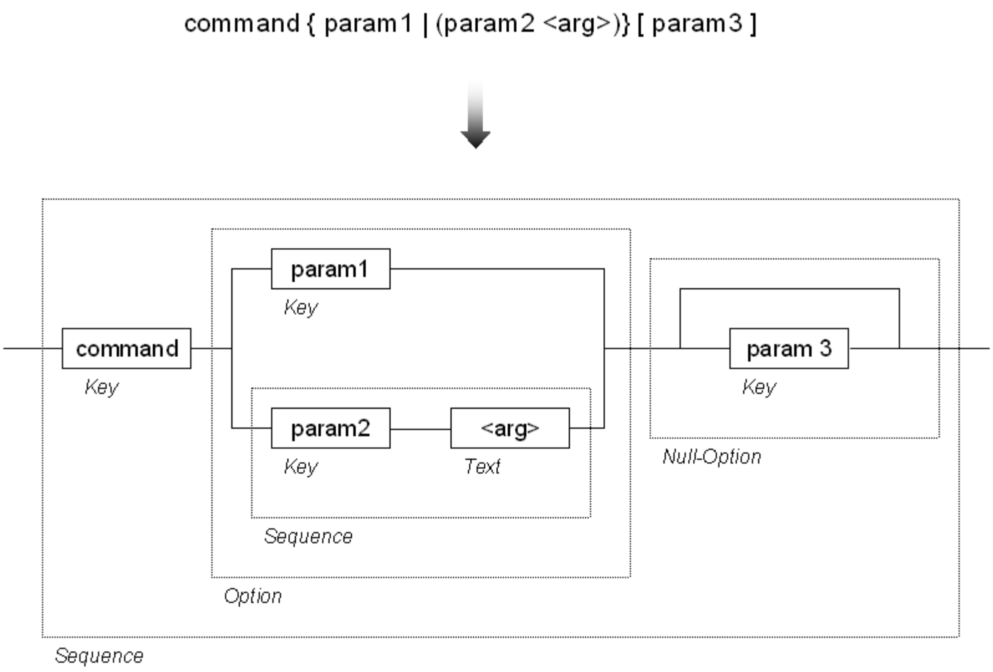

execution modes
configuration modes
operator_exec
-
<hostname>>
administrator_exec
enable
<hostname>#
configure
configure
<hostname>(cfg)#
system
system
<host>(sys)#
ic-voice
ic voice <slot>
<host>(ic-voice) [<slot>]#
profile_acl
profile acl <name>
<host>(pf-acl) [<name>]#
[no] use profile acl <name>
profile_napt
profile napt <profile name>
<host>(pf-napt) [<name>]#
[no] use profile napt <name>
profile_service-policy
profile policy-map < name>
<host>(pf-srvpl) [<name>]#
source
source{class|policy}<name>
<host>(src) [<name>]#
[no] use profile service-policy <name> [input | output]
context_ip
context ip <name>
<host>(ctx-ip) [<name>]#
interface
interface <name>
<host>(if-ip) [<name>]#
port_ethernet
port ethernet <slot> <port>
<host>(prt-eth) [slot/port]#
[no] bind interface <name> [<ip_context>]
[no] bind interface <name> [<ip-context>]
port_serial
port serial <slot> <port>
<host>(prt-ser)[slot/port]#
framerelay
framerelay
<host>(frm-rel)#
pvc
pvc <dlci>
<host>(pvc) [<dlci>]#
gateway_h323
gateway h323 <name>
<host>(gw-h323) [<name>]#
[no] bind interface <name> [<ip-context>]
[no] use profile voip <name>
gateway_isoip
gateway isoip <name>
<host>(gw-isoip) [<name>]#
[no] use profile voip <name>
profile_voip
profile voip <name>
<host>(pf-voip) [<name>]#
profile_tone-set
profile tone-set <name>
<host>(pf-tones) [<name>]#
map profile call- progress- tone <tone-set-name> <call-progress-tone-name>
profile_call-progress-tone
profile call-progress-tone <name>
<host>(pf-callp) [<name>]#
interface_isoip
interface isoip <name>
<host>(if-isoip) [<name>]#
[no] use profile tone-set <name>
context_cs
context cs <name>
<host>(ctx-cs) [<name>]#
interface_h323
interface h323 <name>
<host>(if-h323) [<name>]#
[no] use profile tone-set <name>
[no] use profile tone-set <name>
interface_pstn
interface pstn <name>
<host>(if-pstn) [<name>]#
[no] use profile tone-set <name>
port_isdn
port isdn <slot> <port>
<host>(prt-isdn) [slot/port]#
[no] bind port <slot> <port>
There can be more than one instance of this component
bind commands
<mode name>
<enter command>
<prompt>
links

Figure iii: Configuration Modes and Bind and Link Commands Overview

SmartWare Command Syntax

The SmartWare commands are collected in configuration modes as illustrated in Figure iii. For each mode a chapter is available with detailed information within this guide. The command syntax is illustrated with an example command in Figure iv below.



```
command { param1 | (param2 <arg>)} [ param3 ]
```

Figure iv: EBNF Syntax

APPENDIX B

Internetworking Terms and Acronyms

Abreviation	Meaning
Numeric	
10BaseT	Ethernet Physical Medium
A	
AAL	ATM Adaptive Layer
ABR	Available Bit Rate
AC	Alternating Current
AOC	Advice of Charge
ATM	Asynchronous Transfer Mode
audio 3.1	ISDN Audio Service up to 3.1 kHz
audio 7.2	ISDN Audio Service up to 7.2 kHz
B	
BRA	Basic Rate Access
BRI	Basic Rate Interface
C	
CAC	Carrier Access Code
CBR	Constant Bit Rate
CFP	Call Forwarding Procedure
CD ROM	Compact Disc Read Only Memory
CDR	Call Detail Record
CLEC	Competitive Local Exchange Carriers
CLI	Command Line Interface
CLIP	Calling Line Identification Presentation
CO	Central Office
CPE	Customer Premises Equipment
CPU	Central Processor Unit
CRC32	32 bit Cyclic Redundancy Check
D	
DC	Direct Current
DDI	Direct Dialing In number
DHCP	Dynamic Host Configuration Protocol
DSL	Digital Subscriber Line

Abreviation	Meaning
DSLAM	Digital Subscriber Line Access Multiplexer
DSP	Digital Signal Processor
DTMF	Dual Tone Multifrequency
E	
E1	Transmission Standard at 2.048 Mb/s
E-DSS1	ETSI Euro ISDN Standard
EFS	Embedded File System
ET	Exchange Termination
ETH	Ethernet
F	
FAQ	Frequently Asked Questions
FCC	Federal Communication Commission
FR	Frame Relay
G	
G.711	ITU-T Voice encoding standard
G.723	ITU-T Voice compression standard
GUI	Graphic User Interface
GW	GateWay
H	
H.323	ITU-T Voice over IP Standard
HFC	Hybrid Fibre Coax
HTTP	HyperText Transport Protocol
HW	HardWare
I	
ICMP	Internet Control Message Protocol
IAD	Integrated Access Device
ILEC	Incumbent Local Exchange Carriers
IP	Internet Protocol
ISDN	Integrated Services Digital Network
ISDN NT	ISDN Network Termination
ISDN S	ISDN S(ubscriber Line) Interface
ISDN T	ISDN T(runk Line) Interface
ISDN TE	ISDN Network Terminal Mode
ISoIP	ISDN over Internet Protocol

Abreviation	Meaning
ITC	Information Transfer Bearer Capability
L	
L2TP	Layer Two Tunneling Protocol
LAN	Local Area Network
LCR	Least Cost Routing
LDAP	Lightweight Directory Access Protocol
LED	Light Emitting Diode
LE	Local Exchange
LT	Line Termination
M	
MGCP	Media Gateway Control Protocol
MIB II	Management Information Base II
Modem	Modulator – Demodulator
MSN	Multiple Subscriber Number
N	
NAPT	Network Address Port Translation
NAT	Network Address Translation
NIC	Network Interface Card
NT	Network Termination
NT1	Network Termination 1
NT2	Network Termination 2
NT2ab	Network Termination with 2a/b Connections
O	
OEM	Original Equipment Manufacturer
OSF	Open Software Foundation
OSPF	Open Shortest Path First
P	
PBR	Policy Based Routing (principles)
PBX	Private Branch Exchange
PC	Personal Computer
PMC	Production Technology Management Committee
POP	Point of Presence
POTS	Plain Old Telephony Service
PRA	Primary Rate Access

Abreviation	Meaning
PRI	Primary Rate Interface
PSTN	Public Switched Telephone Network
pt-mpt	point-to-multi point
pt-pt	point-to-point
PVC	Permanent Virtual Circuit
pwd	Password
PWR	Power
Q	
QoS	Quality of Service
R	
RIPv1	Routing Information Protocol Version 1
RIPv2	Routing Information Protocol Version 2
RJ-45	Western Connector Type
RTM	Route Table Manager
RTP	Real-time Protocol
S	
S1	SN-connection for Trunk Line
S2	SN-connection for Subscriber Line
SAR	Segmentation and Reassembly
S-Bus	Subscriber Line (Connection) Bus
SCN	Switched Circuit Network
SDSL	Symmetric Digital Subscriber Line
SGCP	Simple Gateway Control Protocol
SME	Small and Medium Enterprises
SmW	SmartWare
SN	SmartNode
SNMP	Simple Network Management Protocol
SOHO	Small Office Home Office
SONET	Synchronous Optical Network
SS7	Signaling System No. 7
STM	SDH Transmission at 155 Mb/s
SVC	Switched Virtual Circuit
SW	SoftWare
T	

Abreviation	Meaning
TCP/IP	Transport Control Protocol / Internet Protocol
TE	Terminal Equipment
TFTP	Trivial File Transfer Protocol
U	
UBR	Unspecified Bit Rate
UD 64	Unrestricted Data 64 kb/s
UDP	User Datagram Protocol
V	
VBR	Variable Bit Rate
VCI	Virtual Channel Identifier
VoIP	Voice over Internet Protocol
VPI	Virtual Path Identifier
W	
WAN	Wide Area Network

APPENDIX C

Used IP Ports in SmartWare Release 2.00

Component	Port	Description
H.323	UDP 1719	RAS for gatekeeper connection
	TCP 1720	Call signaling port for H.323 (adjustable)
ISoIP	UDP 1106	Voice data
	UDP 1107	Voice statistics
	TCP 1106	Signaling control messages
NAPT	TCP 8000-15999	NAPT port range
Telnet	TCP 23	TCP server port
Webserver	TCP 80	TCP server port

Available Voice Codecs in SmartWare 2.00

Protocol	Codec	Net Bandwidth per Call (kbps)	Min. Compression Delay (ms)	Used Bandwidth per Call (kbps)	Usage
ISoIP	G.711 A-Law	64	10	96	Uncompressed, best voice quality, Europan audio-digitizing
	G.711 u-Law	64	10	96	Uncompressed, best voice quality, American audio-digitizing
	G.726	16, 24, 32, 40	20	32, 40, 48, 56	The G.726 is an ADPCM based codec, with small memory footprint but fairly high CPU time requirements.
	G.727	16, 24, 32	20	32, 40, 48	Embedded ADPCM. See also G.726
	G.723.1	5.3, 6.3	30	16, 17	Good voice quality at lowest bandwidth, like analog phone, acceptable delay
	G.729a	8	10	40	Best relationship between voice quality and used bandwidth, low delay
	Netcoder	6.4, 9.6	20	22.4, 25.6	License free low bandwidth codec comparable to G.723
	Transparent	64	10	96	Transparent ISDN data, no echo cancellation
H.323	G.711 A-law	64	10	96	Uncompressed, best voice quality, Europan audio-digitizing
	G.711 U-law	64	10	96	Uncompressed, best voice quality, American audio-digitizing
	G.723.1	6.3	30	17	Good voice quality at lowest bandwidth, like analog phone, acceptable delay
	G.729a	8	10	40	Best relationship between voice quality and used bandwidth, low delay
	Transparent	64	10	96	Transparent ISDN data, no echo cancellation

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