SNA Switching Services Commands

Use the commands in this chapter to configure and monitor the SNA Switching Services (SNASw) feature. For SNASw configuration tasks and examples, refer to the "Configuring SNA Switching Services" chapter of the *Cisco IOS Bridging and IBM Networking Configuration Guide*.

ping sna

To initiate an APPC session with a named destination LU to run the APING transaction program to check network integrity and timing characteristics, use the **ping sna** privileged EXEC command.

ping sna [**-1**] [**-c** *consecutive packets*] [**-i** *number-iterations*] [**-m** *mode*] [**-n**] [**-r**] [**-s** *size*]
[**-t** *tpname*] [**-u** *userid* **-p** *password*] *destination*

Syntax Description

-1	(Optional) Sends data from client to server only (no echo).
-c *consecutive blocks*	(Optional) Specifies the number of data blocks sent per iteration.
-i *number-iterations*	(Optional) Specifies number of iterations.
-m *mode*	(Optional) Specifies APPC mode to use.
-n	(Optional) Skips any security (SECURITY=NONE).
-r	(Optional) Displays route taken by APPC PING.
-s *size*	(Optional) Specifies the size of the of the data block to be sent.
-t *tpname*	(Optional) Specifies TP to start on the server.
-u *userid*	(Optional) Specifies USERID.
-p *password*	(Optional) Specifies the password associated with the userid specified after **-u**. Required when **-u** is specified. Password must be 1 to 8 characters.
destination	Specifies the fully qualified name of the destination logical unit or control point with which an APING transaction should be initiated.

Defaults

If **-1** is not specified, **ping sna** will send the quantity of data represented by **-s** *size*, **-i** *number-iterations*, and **-c** *consecutive blocks*. It will be first sent in the direction from the **ping sna** requester to the receiver, then in the opposite direction.

If **-c** is not specified, consecutive data blocks per iteration defaults to 1.

If **-i** is not specified, number of iterations defaults to 2.

If **-m** is not specified, the mode defaults to #INTER.

If **-s** is not specified, the size of each block of data transferred defaults to 100 bytes.

If **-t** is not specified, the default transaction program name on the receiver is APINGD.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.0(5)XN	This command was introduced.
12.0(7)T	This command was integrated into Cisco IOS Release 12.0 T.

Usage Guidelines   The **ping sna** command requires the destination to support the APING transaction program for the ping to succeed.

Examples   The following is an example of the **ping sna** command contact the destination NETA.CP001:

```
ping sna NETA.CP001
```

Related Commands

Command	Description
show snasw session	Displays the SNASw session objects.

show snasw class-of-service

To display the COS definitions predefined to SNASw, use the **show snasw class-of-service** command.

show snasw class-of-service [**brief** | **detail**]

Syntax Description

brief	(Optional) Indicates a one-line display per displayed resource. The brief version displays COS name, transmission priority, and number of node and TG rows.
detail	(Optional) Indicates a detailed, multiline display of all fields returned for COS display.

Defaults

The default display is brief.

Command History

Release	Modification
12.0(5)XN	This command was introduced.
12.0(7)T	This command was integrated into Cisco IOS Release 12.0 T.

Examples

The following is a truncated example of the **show snasw class-of-service** command:

```
Router# show snasw class-of-service
Number of class of service definitions 7

     SNA Classes of Service
      Name     Trans. Pri.  Node Rows  TG Rows
      -------- -----------  ---------  -------
  1> #BATCH    Low              8          8
  2> #INTER    High             8          8
  3> CPSVCMG   Network          8          8
  4> #BATCHSC  Low              8          8
  5> #CONNECT  Medium           8          8
  6> #INTERSC  High             8          8
  7> SNASVCMG  Network          8          8

Router# show snasw class-of-service detail
Number of class of service definitions 7

1>
Class of service name                      #BATCH
Transmission priority                      Low
Number of node rows                        8
Number of TG rows                          8

1.1>Node row weight                        5
Congestion min                             No
Congestion max                             No
Route additional resistance min            0
Route additional resistance max            31
```

Related Commands

Command	Description
show snasw mode	Displays the SNASw modes.

show snasw connection-network

To display the connection networks (virtual nodes) defined to the local node, use the **show snasw connection-network** command.

> **show snasw connection-network** [**brief** | **detail**]

Syntax Description	**brief**	(Optional) Indicates a one-line display per resource. The brief version displays the connection network name, the number of attached ports, and the port names in the connection network.
	detail	(Optional) Indicates a detailed, multiline display of all fields returned for connection-network display.

Defaults

The default display is brief.

Command History

Release	Modification
12.0(5)XN	This command was introduced.
12.0(7)T	This command was integrated into Cisco IOS Release 12.0 T.

Examples

The following is an example of the **show snasw connection-network** command:

```
Router# show snasw connection-network
Connection network definitions 1

     SNA Connection Networks
      Resource Name     Attached Ports          Port Name(s)
    ----------------   --------------   ---------------------------------
    1> CISCO.VN                    1     TR0

Router# show snasw connection-network detail
Connection network definitions 1

1>
Connection network name                        CISCO.VN
Effective capacity                             16 Mbps
Cost per connect time                          0
Cost per byte                                  0
Propagation delay                              384 microseconds
User defined parameter 1                       128
User defined parameter 2                       128
User defined parameter 3                       128
Security                                       Nonsecure

1.1>Port name                                  TR0
```

Related Commands

Command	Description
show snasw link	Displays the SNASw link objects.

show snasw directory

To display the SNASw directory entries, use the **show snasw directory** command.

show snasw directory [**name** *resourcenamefilter*] [**brief** | **detail**]

Syntax Description

name *resourcenamefilter*	(Optional) Indicates the fully qualified name of the resource (1 to 17 characters). Only resource names that match the specified name are displayed.
brief	(Optional) Indicates a one-line display for each resource. The brief version displays resource name, owning CP name, network node server name, and entry type.
detail	(Optional) Indicates a detailed, multiline display of all fields returned for the directory display.

Defaults

The default display is brief.

Command History

Release	Modification
12.0(5)XN	This command was introduced.
12.0(7)T	This command was integrated into Cisco IOS Release 12.0 T.

Examples

The following is an example of the **show snasw directory** command:

```
Router# show snasw directory
Total Directory Entries 2

    SNA Directory Entries
      Resource Name      Owning CP Name       NN Server      Entry Type
    -----------------  -----------------  -----------------  ----------
   1> CISCO.A           CISCO.A            CISCO.B            Registry
   2> CISCO.B           CISCO.B            CISCO.B            Home

Router# show snasw directory detail
Total Directory Entries 2

1>
Resource name                                 CISCO.A
NN server name                                CISCO.B
Entry type                                    Registry
Location                                      Local to this domain
Resource owner's CP name                      CISCO.A
Apparent resource owner's CP name
Wildcard                                      Explicit
```

```
2>
Resource name                              CISCO.B
NN server name                             CISCO.B
Entry type                                 Home
Location                                   Local to this node
Resource owner's CP name                   CISCO.B
Apparent resource owner's CP name
Wildcard                                   Explicit
```

Related Commands	Command	Description
	snasw location	Configures the location of a resource.

show snasw dlctrace

To display the captured DLC trace information to the console, use the **show snasw dlctrace** command.

show snasw dlctrace [**all** | **last** *number-records* | **next** *number-records*] [**brief** | **detail**] [**filter** *filter-string*] [**id** *recordid*]

Syntax Description

all	(Optional) Indicates that all records in the dlctrace buffer are displayed.
last *number-records*	(Optional) Indicates the last *n* frames before the record identified in the ID operand (or before the last record in the trace if the ID operand is not coded) are displayed.
next *number-records*	(Optional) Indicates the next frames after the record identified in the ID operand (or from the beginning of the trace if the ID operand is not coded) are displayed.
brief	(Optional) Indicates a one-line display per trace entry describing the type of frame traced.
detail	(Optional) Indicates a a detailed, multiline display of the frame that displays the brief information plus a hexadecimal dump of the entire frame.
filter *filter-string*	(Optional) Indicates that a string follows against which the formatted trace output are filtered. Only frames that contain the filter-string are displayed.
id *recordid*	(Optional) Indicates the 1 to 999,999 trace record identifier. Only the frame ID that matches the record specified is displayed.

Defaults

If **id** *recordid* is specified, **next** is the default parameter; if not, **last** is the default parameter.

The default display is brief.

Command History

Release	Modification
12.0(5)XN	This command was introduced.
12.0(7)T	This command was integrated into Cisco IOS Release 12.0 T.

Examples

The following is an example of the **show snasw dlctrace** command:

```
Router# show snasw dlctrace id 2467 next 20
DLC Trace Output

2467   LINKT   In  sz:43    HPR +Rsp IPM    slctd nws:0007
2468   LINKT   In  sz:212   HPR +Rsp IPM    slctd nws:0007
2469   LINKT   In  sz:52    HPR CP CAPABILITIES
2470   LINKT   In  sz:221   HPR CP CAPABILITIES
2471   LINKT   Out sz:282   HPR MIS
2472   LINKT   Out sz:43    HPR +Rsp IPM    slctd nws:0007
2473   LINKT   In  sz:154   HPR Rq Bind CISCO.B CISCO.A
2474   LINKT   In  sz:323   HPR Rq Bind CISCO.B CISCO.A
2475   LINKT   Out sz:361   HPR MIS
```

```
2476    LINKT     Out sz:132  HPR +Rsp Bind
2477    LINKT     In  sz:102  HPR fmh5 CP CAPABILITIES
2478    LINKT     In  sz:271  HPR fmh5 CP CAPABILITIES
2479    LINKT     Out sz:282  HPR MIS
2480    LINKT     Out sz:43   HPR +Rsp IPM     slctd nws:0007
2481    LINKT     Out sz:291  HPR MIS
2482    LINKT     Out sz:52   HPR CP CAPABILITIES
2483    LINKT     In  sz:43   HPR +Rsp IPM     slctd nws:0007
2484    LINKT     In  sz:212  HPR +Rsp IPM     slctd nws:0007
2485    LINKT     Out sz:45   HPR
2486    LINKT     In  sz:45   HPR

Router# show snasw dlctrace id 2486 detail
DLC Trace Output

2486    LINKT     In  sz:45   HPR
 10:08:36.14, 14 March 1993
   0000 C60080FF 00000000 00010000 00000400  *F..............*
   0010 0A000000 00000001 7E050E00 00000000  *........=.......*
   0020 01000001 7E000000 00000000 00        *....=........   *
```

	Command	Description
Related Commands	**snasw dlctrace**	Traces frames arriving and leaving SNASw.
	snasw dlcfilter	Filters frames being captured.

show snasw dlus

To display the SNASw DLUS objects, use the **show snasw dlus** command.

show snasw dlus [**brief** | **detail**]

Syntax Description

brief	(Optional) Indicates that one line per DLUS is displayed. The brief version includes the DLUS name, state (active or inactive), port name, cpname, node type, and number of active PUs on the DLUS.
detail	(Optional) Indicates the detailed, multiline display that shows all fields returned for DLUS displayed.

Defaults

The default display is brief.

Command History

Release	Modification
12.0(5)XN	This command was introduced.
12.0(7)T	This command was integrated into Cisco IOS Release 12.0 T.

Examples

The following is an example of the **show snasw dlus** command:

```
Router# show snasw dlus
Number of Dependent LU Servers2
SNA Dependent LU Servers
        DLUS Name       Default?  Backup?  Pipe State        PUs
        ----------------  --------  -------  ----------------  -------
    1> NETA.SJMVS3        Yes       No       Active            1
    2> NETA.SJMVS4        No        Yes      Inactive          0


Router# show snas dlus detail
Number of Dependent LU Servers2

1>
DLUS name                                      NETA.SJMVS3
Is this the default DLUS                       Yes
Is this the backup default DLUS                No
Pipe state                                     Active
Number of active PUs                           1
DLUS pipe statistics:
  REQACTPUs sent                               1
  REQACTPU responses received                  1
  ACTPUs received                              1
  ACTPU responses sent                         1
  DACTPUs received                             0
  DACTPU responses sent                        0
  REQDACTPUs sent                              0
  REQDACTPU responses received                 0
  ACTLUs received                              16
  ACTLU responses sent                         1
  DACTLUs received                             0
```

```
DACTLU responses sent                          0
SSCP-PU MUs sent                               0
SSCP-PU MUs received                           0
SSCP-LU MUs sent                              19
SSCP-LU MUs received                           3
```

Related Commands	Command	Description
	snasw dlus	Specifies parameters related to DLUR/DLUS functionality.

show snasw ipstrace

To display the interprocess signal trace on the router console, use the **show snasw ipstrace** command.

show snasw ipstrace [**all** | **next** *number-records* | **last** *number-records*] [**filter** *filter-string*] [**id** *recordid*]

Syntax Description

all	(Optional) Specifies all records are displayed
next *number-records*	(Optional) Displays records from beginning or following record IS.
last *number-records*	(Optional) Indicates that the last *n* frames before the record identified in the ID operand (or before the last record in the trace if the ID operand is not coded) are displayed.
filter *filter-string*	(Optional) Indicates that a string follows against which the formatted trace output is filtered. Only frames that contain the filter-string are displayed.
id *recordid*	(Optional) Indicates the 1 to 999,999 trace record identifier. Only the frame ID that matches the record specified are displayed.

Defaults

No default behaviors or values.

Command History

Release	Modification
12.0(5)XN	This command was introduced.
12.0(7)T	This command was integrated into Cisco IOS Release 12.0 T.

Examples

The following is an example of the **show snasw ipstrace** command:

```
Router# show snasw ipstrace
423452 : DLC_UI_MU : PC(2350000) -> DLC(2300000) Q 2
 03/14/1993 10:11:36.18
    00000000 00000000 61BB3F50 00800000 00000000 00000000 00000000 00000000
    000000FF 000000FF 00000000 00000000 05010000 000000FF 50130000 002D00D2
    02340000 03000000 00000000 61BB3FB0 00140050 0000017E 000100FF 00000000
    00000000 01000000 00000000 00000000 0000017E 00000000 00000000 00000000
    00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
    00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
    00000000 00000000 00000000 00000000 00C6C600 80FF0000 00000001 00000000
    04000A00 00000000 00017E05 0E000000 01000100 00017E00 00000000 00000000
```

Related Commands

Command	Description
snasw ipstrace	Sets up a trace buffer and begins tracing IPS trace elements
snasw ipsfilter	Filters interprocess signal trace elements being traced using the **snasw ipstrace** or **debug snasw ips** commands.

show snasw link

To display the SNASw link objects, use the **show snasw link** command.

show snasw link [**brief** | **detail**] [**cpname** *cpnamefilter*] [**name** *linknamefilter*] [**port** *portnamefilter*] [**rmac** *macfilter*] [**xid** *xidfilter*]

Syntax Description		
	brief	(Optional) Indicates that one line per link is displayed. The brief version includes the link name, state (active or inactive), port name, adjacent CP name, node type information, number of sessions, and HPR support. The number of sessions does not include HPR sessions.
	detail	(Optional) Indicates that a detailed, multiline display that shows all fields returned for links displayed.
	cpname *cpnamefilter*	(Optional) Indicates a fully qualified cpname (1 to 17 characters). Only links with CP names (as known to the router) that match the specified cpname are displayed.
	name *linknamefilter*	(Optional) Indicates the name of the link to be displayed. Only links matching this name are displayed.
	port *portnamefilter*	(Optional) Indicates the handle "naming" for the specific port (1 to 8 characters). All links associated with a port matching the filter are displayed.
	rmac *macfilter*	(Optional) Indicates a 48-bit MAC address in hexadecimal form. Only links with a remote MAC address matching the MAC address specified are displayed.
	xid *xidfilter*	(Optional) Indicates a 4-byte XID (idnum/idblk) specified in hexadecimal form. Only links matching the configured XID are displayed.

Defaults		The default display is brief.

Command History	Release	Modification
	12.0(5)XN	This command was introduced.
	12.0(7)T	This command was integrated into Cisco IOS Release 12.0 T.

Examples

The following is an example of the **show snasw link** command:

```
Router# show snasw link
Number of links 1

    SNA Links                                                    HPR
    Link Name   State    Port Name Adjacent CP Name  Node Type    Sess  Sup
    ---------   -------  --------- ----------------  -----------  ----  ---
  1> LINKT      Active   TR0       CISCO.B           Network Node    0  Yes
```

```
Router# show snasw link detail
Number of links 1

1>
Link name                                        LINKT
Port name                                        TR0
DLC type                                         Token-ring
Destination DLC Address                          000B.1AA4.9280.04
Link state                                       Active
Link substate                                    Active
Number of active sessions traversing link        0
Adjacent Node Id                                 X'FFF00000'
Max send frame data (BTU) size                   4400
Adjacent node CP name                            CISCO.B
Adjacent node type                               Network Node
CP-CP session support                            Yes
Link station role                                Secondary
Transmission group number                        21
Limited resource                                 No
Effective capacity                               16 Mbps
Cost per connect time                            0
Cost per byte                                    0
Propagation delay                                384 microseconds
User defined parameter 1                         128
User defined parameter 2                         128
User defined parameter 3                         128
Security                                         Nonsecure
Routing Information Field
Primary DLUS Name
Backup DLUS Name
Downstream PU Name
Retry link station                               Yes
Dynamic link station                             No
Adjacent node is a migration node                No
Link station statistics:
  Total XID bytes sent                           466
  Total XID bytes received                       344
  Total XID frames sent                          5
  Total XID frames received                      4
  Total data bytes sent                          752
  Total data bytes received                      685
  Total data frames sent                         8
  Total data frames received                     9
  Total session control frames sent              0
  Total session control frames received          0
  Total number of successful XID exchanges       1
  Total number of unsuccessful XID exchanges     0
```

Related Commands	Command	Description
	snasw link	Configures upstream links.

show snasw lu

To display the SNA Switching Services (SNASw) dependent logical units (LU)s, use the **show snasw lu** command in user EXEC or privileged EXEC mode.

show snasw lu [**brief** | **detail**] [**name** *lu-name*] [**pu** *pu-name*]

Syntax Description		
	brief	(Optional) Indicates that one line per LU is displayed. The brief display includes LU name, physical unit (PU) name, dependent logical unit server (DLUS) name, and primary logical unit (PLU) name.
	detail	(Optional) Indicates that a detailed, multiline display that shows all fields returned for the link is displayed.
	name *lu-name*	(Optional) Indicates an LU name to filter. Only LUs matching the specified name are displayed.
	pu *pu-name*	(Optional) Indicates a PU name to filter. Only LUs for the specified name are displayed.

Defaults   The default display is brief.

Command Modes   User EXEC
Privileged EXEC

Command History	Release	Modification
	12.0(5)XN	This command was introduced.
	12.0(7)T	This command was integrated into Cisco IOS Release 12.0 T.

Examples   The following sample display is from the **show snasw lu** command:

```
Router# show snasw lu

Number of DLUR LUs 49

     SNA DLUR LUs
     LU Name   PU Name   DLUS Name          PLU Name
     --------  --------  -----------------  -----------------
  1> CWBC0601  CWBC06    NETA.MVSD
  2> CWBC0602  CWBC06    NETA.MVSD
```

The following is sample output from the **show snasw lu detail** command:

```
Router# show snasw lu detail

Number of DLUR LUs 49

1>
LU name                                          CWBC0601
LU status                                        Active
```

```
SLU status                                        No session
PU name                                           CWBC06
DLUS name                                         NETA.MVSD
Primary LU name
LU location                                       Downstream
LU  FSM history                                   (00,00)->(01,01)->(02,0E)->(03,03)->04
SLU FSM history                                   (00,10)->00
```

Table 3 describes the significant fields shown in the output.

Table 3   show snasw lu Field Descriptions

Field	Description
LU name	The name of the LU.
PU name	The physical unit this LU is defined to.
DLUS name	Dependent LU server for the PU and LU.
PLU name	The name of the host LU that this LU is in session with. If the LU is not in session, no PLU name will be displayed.
LU status	The state of the system services control points (SSCP)-LU session. States are: • Active—The SSCP-LU is active and available for LU-LU sessions. • Pend ACTLU rsp—The SSCP-LU session is pending activation. • Pend DACTLU rsp—The SSCP-LU session is pending deactivation. • Reset—The SSCP-LU session is not active.
SLU status	The current state of the LU-LU session. States are: • In Session—The LU-LU session is active. • No Session—The LU-LU session is not active. • Pend BIND rsp—The LU-LU session is pending activation. • Pend UNBIND rsp—The LU-LU session is pending deactivation.
Primary LU name	The name of the host LU that this LU is in session with. If the LU is not in session, no PLU name will be displayed.
LU location: Downstream	Indicates that the LU resides on a node downstream from this SNASw node.
LU FSM history	A history of the states and actions of the SSCP-LU session for diagnostic use by Cisco technical support.
SLU FSM history	A history of the states and actions of the LU-LU session for diagnostic use by Cisco technical support.

Related Commands

Command	Description
show snasw dlus	Displays the SNASw DLUS objects.
show snasw pu	Displays the SNASw PUs that require or request SSCP-PU services.

show snasw mode

To display the SNASw modes, use the **show snasw mode** command.

show snasw mode

Syntax Description This command has no arguments or keywords.

Defaults No default behaviors or values.

Command History

Release	Modification
12.0(5)XN	This command was introduced.
12.0(7)T	This command was integrated into Cisco IOS Release 12.0 T.

Examples The following is an example of the **show snasw mode** command:

```
Router# show snasw mode
Number of modes 8

     SNA Modes
      Name      Associated COS
    ---------  --------------
  1> #BATCH     #BATCH
  2> #INTER     #INTER
  3> CPSVCMG    CPSVCMG
  4>            #CONNECT
  5> #BATCHSC   #BATCHSC
  6> #INTERSC   #INTERSC
  7> CPSVRMGR   SNASVCMG
  8> SNASVCMG   SNASVCMG
```

Related Commands

Command	Description
show snasw class-of-service	Displays the COS definitions predefined to SNASw.

show snasw node

To display details and statistics of the SNASw operation, use the **show snasw node** command.

> **show snasw node**

Syntax Description   This command has no arguments or keywords.

Defaults   No default behaviors or values.

Command History

Release	Modification
12.0(5)XN	This command was introduced.
12.0(7)T	This command was integrated into Cisco IOS Release 12.0 T.
12.1	Additional fields were added to the command output.
12.2	Additional fields were added to the command output to describe RTP information.

Examples   The following is an example of the **show snasw node** command:

```
Router# show snasw node
Node type                                 Branch Network Node
Node name                                 NETA.NODE
CP alias                                  NODE
Node ID                                   X'FFF00000'
Time active                               9 days,  11 hrs,  57 mins,  13 secs
Defined LS good XID exchanges             2
Defined LS bad XID exchanges              0
Dynamic LS good XID exchanges             243
Dynamic LS bad XID exchanges              0
Number of active ISR sessions             0
DLUR release level                        1
Branch extender architecture version      1
Mode to COS mapping supported             No
MS includes Multiple Domain Support       Yes
MDS send alert queue size                 10
Maximum locates                           10000
Directory cache size                      10000
Maximum directroy entries (0 is unlimited) 0
Locate timeout in seconds (0 is no timeout) 540
COS cache size                            8
Topology database routing tree cache size 8
Topology database routing tree cache use limit 1
Maximum nodes stored in database (0 unlimited) 0
Maximum TGs stored in database (0 unlimited) 0
Maximum allowed ISR sessions              22000
Maximum receive RU size for ISR sessions  61440
Maximum receive pacing window             7
Storing endpoint RSCVs for debug          Yes
Storing ISR RSCVs for debug               No
Storing DLUR RSCVs for debug              No
DLUR support                              Yes
HPR support                               Yes
```

```
RTP short request retry limit                    6
RTP path switch route attempts                   6
RTP path switch time LOW priority                480 seconds
RTP path switch time MEDIUM priority             240 seconds
RTP path switch time HIGH priority               120 seconds
RTP path switch time NETWORK priority            60 seconds
PD log capture level                             Problem level entries
PD log size                                      500 kilobytes
PD log path                                      disk0:
IPS tracing                                      Inactive
DLC tracing                                      Active
DLC trace format                                 Detailed
DLC trace size                                   500 kilobytes
DLC trace path                                   tftp://10.102.16.25/tftp/node.dlct
Number of links                                  3
Number of local endpoint sessions               4
Number of non-DLUR intermediate sessions         0
Number of DLUR intermediate sessions             0
Number of DLUR PUs                               0
Number of DLUR LUs                               0
```

Related Commands	Command	Description
	show snasw statistics	Displays the SNASw node-wide information.

show snasw pdlog

To display entries in the cyclical problem determination log to the console, use the **show snasw pdlog** command.

>   **show snasw pdlog** [**brief** | **detail**] [**all** | **next** *number-records* | **last** *number-records*] [**filter** *filterstring*] [**id** *recordid*]

Syntax Description

brief	(Optional) Indicates that a one-line description for each pdlog entry is returned.
detail	(Optional) Indicates that a multiline display is returned.
all	(Optional) Specifies all records are displayed.
next *number-records*	(Optional) Displays records from the beginning or following a record ID.
last *number-records*	(Optional) Indicates that the last *n* frames before the record identified in the ID operand (or before the last record in the trace if the ID operand is not coded) are displayed.
filter *filterstring*	(Optional) Shows output filtered on a specific string.
id *recordid*	(Optional) Indicates the 1 to 99999 trace record identifier. Only the frame ID that matches the record specified is displayed.

Defaults

The default display is brief.

Command History

Release	Modification
12.0(5)XN	This command was introduced.
12.0(7)T	This command was integrated into Cisco IOS Release 12.0 T.

Examples

The following is an example of the **show snasw pdlog** command:

```
Router# show snasw pdlog
Problem Determination Log Output

**** 00000014 - AUDIT 512:727 (0) ****
CP-CP sessions established
 Adjacent CP name = CISCO.A
 1015 compliant   = 01
 Topology awareness of CP-CP sessions support = 01
 CP Capabilities :

   000C12C1 00000000 82844000
>From ../dcl/nssrcctp.c 589 :at 0:10:24, 1 March 93
```

Related Commands

Command	Description
snasw pdlog	Controls message logging to the console and the SNA problem determination log cyclic buffer.

show snasw port

To display the SNASw port objects, use the **show snasw port** command.

show snasw port [**brief** | **detail**] [**name** *portnamefilter*]

Syntax Description

brief	(Optional) Indicates that a one-line description for each port entry is displayed.
detail	(Optional) Indicates that a multiline display is returned.
name *portnamefilter*	(Optional) Indicates the name of the port to filter for which information is displayed. Only ports matching name are displayed.

Defaults

The default display is brief.

Command History

Release	Modification
12.0(5)XN	This command was introduced.
12.0(7)T	This command was integrated into Cisco IOS Release 12.0 T.

Examples

The following is an example of the **show snasw port** command:

```
Router# show snasw port
Number of ports 3

     SNA Ports
      Name      State    SAP  HPR-SAP  Interface
     --------  --------  ---  -------  --------------------
  1> ETH0      Active    x04    xC8    Ethernet0/0
  2> SER1      Active           xC8    Serial0/0
  3> TR0       Active    x04    xC8    TokenRing0/0

Router# show snasw port detail
Number of ports 3

1>
Port name                            ETH0
Interface name                       Ethernet0/0
DLC name                             ETH0
Port state                           Active
SAP                                  X'04'
HPR SAP                              X'C8'
Port type                            Shared Access Transport Facility
Port number                          0
Link station role                    Negotiable
Limited resource                     No
Max send frame data (BTU) size       1436
Maximum receive BTU size             1436
Effective capacity                   16 Mbps
Cost per connect time                0
```

```
Cost per byte                              0
Propagation delay                          384 microseconds
User defined parameter 1                   128
User defined parameter 2                   128
User defined parameter 3                   128
Security                                   Nonsecure
Total available link stations              3000
Number reserved for inbound link stations  0
Number reserved for outbound link stations 0
HPR support                                No
HPR requires link level error recovery     No
Retry link stations                        Yes
Maximum activation attempts                0
Implicit links are uplink to End Nodes     No
Activation XID exchange limit              9
Non-activation XID exchange limit          5
Target pacing window size                  7
```

Related Commands	Command	Description
	snasw port	Specifies the DLCs used by SNASw.

show snasw pu

To display the SNASw PUs that require or request SSCP-PU services, use the **show snasw pu** command.

show snasw pu [**brief** | **detail**] [**dlus** *dlusfilter*] [**name** *punamefilter*]

Syntax Description

brief	(Optional) Indicates that one-line per PU is displayed. The brief version includes the PU name, PU ID, state, defined DLUS, and current DLUS.
detail	(Optional) Indicates that a detailed, multiline display that shows all possible fields returned for a link is displayed.
dlus *dlusfilter*	(Optional) Indicates the fully qualified DLUS name (1 to 17 characters). Only PUs that are currently served by the DLUS specified are displayed.
name *punamefilter*	(Optional) Indicates a PU name to filter (1 to 8 characters). Only PUs matching this name are displayed.

Defaults

The default display is brief.

Command History

Release	Modification
12.0(5)XN	This command was introduced.
12.0(7)T	This command was integrated into Cisco IOS Release 12.0 T.

Examples

The following is an example of the **show snasw pu** command:

```
Router# show snasw pu
Number of DLUR PUs 1
SNA DLUR PUs
     PU Name    PU ID     State    Defined DLUS       Current DLUS
     --------   --------  -------- -----------------  -----------------
   1> PL9101    19103001  Active                      NETA.SJMVS3

Router# show snasw pu detail
Number of DLUR PUs 1
1>
PU name                               PL9101
Define DLUS name
Backup DLUS name
Active DLUS name                      NETA.SJMVS3
PU ID (IDBLK/IDNUM)                   X'19103001'
PU location                           Downstream
PU status                             Active
DLUS session state                    Active
Automatic Network Shutdown support    Stop
DLUS retry timeout (seconds)          0
DLUS retry limit                      0
DLUS pipe PCID                        X'FC0B862E4B1CE8FB'
DLUS pipe CP Name                     NETA.DLUR2
```

Related Commands	Command	Description
	show snasw dlus	Displays the SNASw DLUS objects.

show snasw rtp

To display the SNASw RTP connections, use the **show snasw rtp** command.

show snasw rtp [**brief** | **detail**] [**class-of-service** *cosname*] [**cpname** *netid.cpname*] [**name** *connectionnamefilter*] [**tcid** *tcidconnection*]

Syntax Description		
	brief	(Optional) Indicates that one-line per RTP is displayed. The brief version includes the RTP name, local TCID, remote TCID, remote cpname, and COS.
	detail	(Optional) Indicates a detailed, multiline display with all fields returned for RTP is displayed.
	class-of-service *cosname*	(Optional) Shows specific HPR RTP connections by COS name.
	cpname *netid.cpname*	(Optional) Shows specific HPR RTP connections by fully qualified partner CP name, consisting of both network ID and cpname.
	name *connectionnamefilter*	(Optional) Indicates the name of the RTP connection (1 to 8 characters). Only TG records origins or destinations that match the specified name or node records are displayed.
	tcid *tcidconnection*	(Optional) Shows the specific HPR RTP connection for the local TCID connections.

Defaults

The default display is brief.

Command History

Release	Modification
12.0(5)XN	This command was introduced.
12.0(7)T	This command was integrated into Cisco IOS Release 12.0 T.

Examples

The following is an example of the **show snasw rtp** command:

```
Router# show snasw rtp
Number of RTP connections 1

     SNA RTP Connections
     Local TCID (hex)  Remote TCID (hex)   Remote CP Name      COS
     ---------------   -----------------   -----------------   --------
  1> 0000000001000000  0000000001000000    CISCO.B             CPSVCMG


Router# show snasw rtp detail
Number of RTP connections 1
1>
Local NCEID                                X'4052303030303031'
Local TCID                                 X'0000000001000000'
Remote TCID                                X'0000000001000000'
Remote CP name                             CISCO.B
Class of service name                      CPSVCMG
Liveness timer                             180
Short request timer                        704
Number of short request timeouts           0
```

```
Total bytes sent                            484
Total bytes received                        484
Total bytes resent                          0
Total bytes discarded                       0
Total packets sent                          24
Total packets received                      25
Total packets resent                        0
Total packets discarded                     0
Total Session Connector frames sent         2
Total Session Connector frames received     2
Number of invalid SNA frames received       0
Number of gaps detected                     0
Minimum send rate                           1597
Current send rate                           1597
Maximum send rate                           1597
Minimum receive rate                        0
Current receive rate                        0
Maximum receive rate                        0
Burst size                                  8192
Smoothed round trip delay time              352
Last round trip delay time                  8
Number of active sessions                   2
Link name of first hop                      LINKT
Performing ISR boundary function            No
RTP connection type                         CP-CP session
RSCV Length                                 18
Route                                       CISCO.A
                                            <-tg21-> CISCO.B
```

Related Commands	Command	Description
	show snasw session	Displays the SNASw session objects.

show snasw session

To display the SNASw session objects, use the **show snasw session** command.

> **show snasw session** [**local** | **dlur** | **intermediate**] [**name** *sessionnamefilter*] [**pcid** *pcidfilter*] [**brief** | **detail** | **intermediate**]

Syntax Description		
local	(Optional) Indicates that the scope of the display is limited to the types of sessions indicated. Local sessions are those that terminate on the node. Examples include CP-CP sessions and DLUR-DLUS sessions.	
dlur	(Optional) Indicates that the scope of the display is limited to the types of sessions indicated. DLUS sessions are LU-LU sessions passing through the node, which are using the DLUR for dependent session.	
intermediate	(Optional) Indicates that the scope of the display is limited to the types of sessions indicated. Intermediate sessions are LU-LU sessions passing through the node and are not DLUR-associated.	
name *sessionnamefilter*	(Optional) Indicates the fully qualified name (1 to 17 characters). Only sessions that have a local or remote endpoint LU name matching the supplied name are displayed.	
pcid *pcidfilter*	(Optional) Indicates an 8-byte PCID specified in hexadecimal form. All sessions matching the PCID filter are displayed.	
brief	(Optional) Indicates that one-line per session is displayed. The brief version includes PCID, state (active or inactive), session endpoint LU names, and mode.	
detail	(Optional) Indicates a detailed, multiline display that shows all fields returned for the session is displayed.	

Defaults

The default display is brief.

Command History

Release	Modification
12.0(5)XN	This command was introduced.
12.0(7)T	This command was integrated into Cisco IOS Release 12.0 T.

Examples   The following is an example of the **show snasw session** command:

```
Router# show snasw session
Number of local endpoint sessions 4

      SNA Local Endpoint Sessions
         PCID (hex)        Partner LU Name    Link Name   Mode     COS
     ----------------  -----------------  ---------  --------  -------
    1> F4276146FE1472AB  CISCO.C            @I000003   CPSVCMG  CPSVCMG
    2> F42754959A918058  CISCO.C            @I000003   CPSVCMG  CPSVCMG
    3> F4276146FE1472AA  CISCO.A            @R000002   CPSVCMG  CPSVCMG
    4> F4276DF74485118B  CISCO.A            @R000002   CPSVCMG  CPSVCMG


Number of intermediate sessions 2

      SNA Intermediate Sessions
         PCID (hex)       Primary LU Name    Secondary LU Name   Mode      COS
     ----------------  -----------------  -----------------  --------  -------
    1> F42754959A918059  CISCO.C            CISCO.A            SNASVCMG SNASVCMG
    2> F42754959A91805A  CISCO.C            CISCO.A            #INTER   #INTER


Number of intermediate DLUR sessions 0

      SNA DLUR Assisted Intermediate Sessions
         PCID (hex)       Primary LU Name    Secondary LU Name   Mode     COS
     ----------------  -----------------  -----------------  --------  -------


Router# show snasw session detail
Number of local endpoint sessions 4


1>
Partner LU name                           CISCO.C
Mode name                                 CPSVCMG
Class of service name                     CPSVCMG
Transmission priority                     Network
Carried over a limited resource           No
Polarity                                  Primary
Contention                                CONWINNER
SSCP ID received in ACTPU                  X'000000000000'
Session timeout period (ms)               0
Outbound LFSID (SIDH,SIDL,ODAI)           X'02',X'00',B'0'
Procedure correlator ID (PCID)            X'F4276146FE1472AB'
PCID generator CP name                    CISCO.B
FID2 Session ID                           X'F4276146FE1472AB'
Link name                                 @I000003
Session statistics:
  Maximum send RU size                    1152
  Maximum receive RU size                 1152
  Total data frames sent                  3
  Total data frames received              1
  Total FMD data frames sent              3
  Total FMD data frames received          1
  Total bytes sent                        511
  Total bytes received                    15
  Max send pacing window                  7
  Max receive pacing window               7
  Current send pacing window              7
  Current receive pacing window           7
```

Related Commands

Command	Description
show snasw link	Displays SNASw link objects.

show snasw statistics

To display the SNASw node-wide information, use the **show snasw statistics** command.

show snasw statistics

Syntax Description   This command has no arguments or keywords.

Defaults   No default behaviors or values.

Command History

Release	Modification
12.0(5)XN	This command was introduced.
12.0(7)T	This command was integrated into Cisco IOS Release 12.0 T.

Examples   The following is an example of the **show snasw statistics** command:

```
Router# show snasw statistics
SNASw Subsystem Uptime                          3 hrs, 19 mins, 36 secs

Directory Statistics:
  Maximum number of cache entries               10000
  Current number of cache entries               0
  Current number of home entries                2
  Current number of registry entries            4
  Total number of entries in directory          6
  Total cache hits                              0
  Total cache misses                            0
  Number of directed locates sent               2
  Number of directed locates returned not found 0
  Number of directed locates received           0
  Number of broadcast locates sent              0
  Number of broadcast locates returned not found 0
  Number of broadcast locates received          0
  Number of locates outstanding                 0

Topology Statistics:
  Maximum number of nodes                       0
  Current number of nodes                       4
  Total number of received TDUs                 0
  Total number of sent TDUs                     0
  Total received TDUs with lower RSN            0
  Total received TDUs with equal RSN            0
  Total received TDUs with higher RSN           0
  Total received TDUs with higher odd value RSN 0
  Total node state changes requiring TDUs       0
  Total database inconsistencies detected       0
  Total number of timer based TDUs generated    0
  Total number of node records purged           0
  Total received TG updates with lower RSN      0
  Total received TG updates with equal RSN      0
  Total received TG updates with higher RSN     0
```

```
        Total received TG updates with higher odd RSN    0
        Total TG state changes requiring TG updates      5
        Total TG database inconsistencies detected       0
        Total number of timer TG updates generated       0
        Total number of TG records purged                0
        Total number of routes calculated                2
        Total number of routes rejected                  0
        Total number of cache hits in route calculation  0
        Total number of cache misses in rte calculation  7
        Total number of TDU wars detected                0

    Number of processes 23
        CPU/Memory usage per SNA Switch process
        Process Name                        CPU Time (ms)  Memory Used (bytes)
        ---------------------------------   -------------  -------------------
         1> NOF API                              20                    20
         2> N-Base allocated memory               0                 79484
         3> Buffer Manager (BM)                   12                   232
         4> Node Operator Facility (NOF)         152                 13188
         5> Address Space Manager (ASM)           28                  1296
         6> Address Space (AS)                    24                     0
         7> Session Services (SS)                 36                  1676
         8> Directory Services (DS)               92                550036
         9> Configuration Services (CS)           48                  9148
        10> Management Services (MS)               4                   252
        11> Multiple Domain Support (MDS)          0                  3792
        12> Topology & Routing Services (TRS)     24                 22368
        13> Session Connector Manager (SCM)       12                  2232
        14> Session Connector (SCO)                0                  1232
        15> Session Manager (SM)                  56                 13416
        16> Resource Manager (RM)                 64                     0
        17> Presentation Services (PS)            68                     0
        18> Half Session (HS)                     29                     0
        19> Path Control (PC)                    188                 50712
        20> Data Link Control (DLC)              112                   144
        21> Dependent LU Requester (DR)           12                  7032
        22> High Performance Routing (HPR)        12                  3632
        23> Rapid Transport Protocol (RTP)       116                 18460
```

Related Commands

Command	Description
show snasw node	Displays details and statistics of the SNASw operation.

show snasw summary-ipstrace

To display the continuously running "footprint" summary interprocess signal trace on the router console, use the **show snasw summary-ipstrace** command.

> **show snasw summary-ipstrace** [**all** | **next** *number-records* | **last** *number-records*] [**id** *recordid*]
> [**filter** *filter-string*]

Syntax Description

all	(Optional) Specifies all records are displayed.
next *number-records*	(Optional) Displays records from the start or starting with the record ID.
last *number-records*	(Optional) Displays records from the end or prior to the record ID. Indicates that the last *n* frames before the record identified in the ID operand (or before the last record in the trace if the ID operand is not coded) are displayed.
id *recordid*	(Optional) Indicates a 1 to 999,999 trace record identifier.
filter *filter-string*	(Optional) Indicates that a string follows against which the formatted trace output is filtered. Only frames that contain the *filter-string* are displayed.

Defaults   No default behaviors or values.

Command History

Release	Modification
12.0(5)XN	This command was introduced.
12.0(7)T	This command was integrated into Cisco IOS Release 12.0 T.

Examples   The following is an example of the **show snasw summary-ipstrace** command:

```
Router# show snasw summary-ipstrace
IPS Trace Output

433414 : VERB_SIGNAL : SCM(20E0000) -> TRS(20D0000) Q 1
433415 : VERB_SIGNAL : --(0) -> TRS(20D0000) Q 1
433416 : VERB_SIGNAL : TRS(20D0000) -> SS(2080000) Q 1
433417 : VERB_SIGNAL : --(0) -> SS(2080000) Q 1
433418 : VERB_SIGNAL : SS(2080000) -> CS(20A0000) Q 2
433419 : VERB_SIGNAL : --(0) -> CS(20A0000) Q 2
433420 : VERB_SIGNAL : CS(20A0000) -> --(2040000) Q 1
433421 : VERB_SIGNAL : --(0) -> --(2040000) Q 1
433422 : VERB_SIGNAL : --(0) -> NOF(2050000) Q 80
433423 : VERB_SIGNAL : --(0) -> NOF(2050000) Q 80
433424 : VERB_SIGNAL : NOF(2050000) -> DS(2090000) Q 1
433425 : VERB_SIGNAL : --(0) -> DS(2090000) Q 1
433426 : VERB_SIGNAL : DS(2090000) -> --(2040000) Q 1
433427 : VERB_SIGNAL : --(0) -> --(2040000) Q 1
433428 : VERB_SIGNAL : --(0) -> NOF(2050000) Q 80
433429 : VERB_SIGNAL : --(0) -> NOF(2050000) Q 80
433430 : VERB_SIGNAL : NOF(2050000) -> TRS(20D0000) Q 1
433431 : VERB_SIGNAL : --(0) -> TRS(20D0000) Q 1
433432 : VERB_SIGNAL : TRS(20D0000) -> --(2040000) Q 1
433433 : VERB_SIGNAL : --(0) -> --(2040000) Q 1
```

Related Commands	Command	Description
	snasw dump	Copies problem determination logs and traces from internal buffers to an external file server.

show snasw topology

To display the SNASw topology records, use the **show snasw topology** command.

> **show snasw topology** [**name** *cpnamefilter*] [**brief** | **detail**]

Syntax Description

name *cpnamefilter*	(Optional) Indicates the fully qualified name of the CP (1 to 17 characters). Only records that match the cpname specified are displayed.
brief	(Optional) Indicates one line per topology record is displayed.
detail	(Optional) Indicates a detailed, multiline display of topology information.

Defaults

The default display is brief.

Command History

Release	Modification
12.0(5)XN	This command was introduced.
12.0(7)T	This command was integrated into Cisco IOS Release 12.0 T.

Examples

The following is an example of the **show snasw topology** command:

```
Router# show snasw topology
Number of topology entries 2

     SNA Topology Entries
     Dest. Node Name    Type  TG#    TG Type          TG Status
     ----------------   ----  ---  ----------------  --------------------
   1> NETA.MVSD         Intr   21  Uplink            CP-CP sessions active
   2> NETA.BERNIEPU     Enpt    0  Downlink          Active
```

The following is an example of the **show snasw topology detail** command:

```
bernie# show snasw topo detail
Number of topology entries 2

1>
Destination node name                      NETA.MVSD
Destination node type                      Intermediate
Transmission Group Number                  21
Destination address
Resource Sequence Number                   0
TG status                                  CP-CP sessions active
Active CP-CP sessions for this TG          Yes
Is this a branch TG                        No
Branch link type                           Uplink
Effective capacity                         16 Mbps
Cost per connect time                      196
Cost per byte                              196
Propagation delay                          384 microseconds
User defined parameter 1                   128
User defined parameter 2                   128
User defined parameter 3                   128
Security                                   Nonsecure
```

```
2>
Destination node name                    NETA.BERNIEPU
Destination node type                    Endpoint
Transmission Group Number                0
Destination address
Resource Sequence Number                 0
TG status                                Active
Active CP-CP sessions for this TG        No
Is this a branch TG                      No
Branch link type                         Downlink
Effective capacity                       16 Mbps
Cost per connect time                    196
Cost per byte                            196
Propagation delay                        384 microseconds
User defined parameter 1                 128
User defined parameter 2                 128
User defined parameter 3                 128
Security                                 Nonsecure
```

Related Commands	Command	Description
	show snasw link	Displays SNASw link objects.

snasw cpname

To define a control point (CP) name for SNASw, use the **snasw cpname** command in global configuration mode. To deactivate SNASw and remove the CP definition, use the **no** form of this command.

> **snasw cpname** {*netid.cpname* | *netid* [*hostname* | **ip-address** *interface-name*]}
> [**hung-pu-awareness** *timer-value*] [**hung-session-awareness** *timer-value*] [**locate-timeout**
> *timeout-value*] [**max-pacing-window** *max-value*] [**remove-rscvs**] [**station-segmentation**]

> **no snasw cpname**

Syntax Description		
netid.cpname	Fully qualified CP name for this node, consisting of both network ID and CP name.
netid	Partial CP name, which consists of only a network ID. If this option is selected, you must also configure the hostname or IP address operands to complete the fully qualified CP name.
hostname	(Optional) Indicates a CP name that is defined by using the hostname which is configured on the router. When configuring this operand, code a *netid* only. The last eight characters of the hostname are used to complete the CP name.
ip-address *interface-name*	(Optional) Indicates the CP name that is defined by deriving the CP name from the IP address on the interface that is indicated in the *interface-name*. When configured, this operand requires a *netid* operand. In addition, a portion of the CP name can be configured. The remaining characters of the CP name that are not configured are generated from the IP address that is indicated.
	The generated characters are derived from a hexadecimal format of the IP address for the interface that is specified.
hung-pu-awareness *timer-value*	(Optional) Indicates the interval at which Dependent Logical Unit Requestor (DLUR) supported physical units (PUs) are checked to see if they are hung in a pending activate PU state. If a PU is in this state for two consecutive iterations of this timer, then the PU is considered hung. No attempt is made to recover the hung PU, but for diagnostic purposes message DLUR_LOG_23 (A REQACTPU RSP has not been received. Possible hung PU problem) is written to the problem determination log. If the PU later becomes activated, message DLUR_LOG_24 (A PU previously logged as possibly hung is no longer possibly hung) is issued. The valid range is from 5 to 65535 seconds. If this keyword is not specified, the default timer-value is 300 seconds.
hung-session-awareness *timer-value*	(Optional) Indicates the length of time when a new intermediate session that is still in a non-active state is considered hung. No attempt is made to clean up the hung session, but for diagnostic purposes message SCM_LOG_16 (Slow session activation detected) is issued. The valid range is from 5 to 65535 seconds. If this keyword is not specified, the default timer-value is 180 seconds.

locate-timeout *timeout-value*	(Optional) Indicates the time when an Advanced Peer to Peer Networking (APPN) Locate Search message is considered lost and is cleaned up. This will likely result in the failure of the session for which the Locate Search message was sent. When this condition occurs message DS_LOG_18 (Locate search timed out) is issued. The valid range is from 0 to 65535 seconds. A value of 0 indicates that no timeout occurs. A value from 1 to 29 seconds is rounded up to 30 seconds. If this keyword is not specified the default timeout-value is 540 seconds.
max-pacing-window *max-value*	(Optional) Indicates the upper limit of the Receive Pacing window size for intermediate sessions. When variable pacing is used, the Receive Pacing window size will not exceed this value. It may be necessary to configure a small Receive Pacing window size (such as 7) to improve performance when both batch and interactive traffic share the same network. The valid range is from 7 to 65535. If a value is not specified, the default is 64.
remove-rscvs	(Optional) Indicates that Route Selection Control Vectors (RSCVs) will be removed from incoming BINDs that are received from an upstream node before forwarding the BINDs downstream. Removing RSCVs from BINDs enables a downstream network node (NN) that is connected over a low entry networking (LEN) link to receive the BINDs and forward them to the destination node.
station-segmentation	(Optional) Sends all segments (for example, FIS, MIS, and LIS) to a particular LU before sending segments to another LU, which prevents PU 2.0 devices (that do not support segment interleaving) from generating sense code 80070000. Use this keyword for XID0 devices.

Defaults　　No default behavior or values.

Command Modes　　Global configuration

Command History

Release	Modification
12.0(5)XN	This command was introduced.
12.0(7)T	This command was integrated into Cisco IOS Release 12.0 T.
12.1	The **station-segmentation** and **max-pacing-window** keywords were added.
12.2	The **remove-rscvs** keyword was added.
12.3	The **hung-pu-awareness**, **hung-session-awareness**, and **locate-timeout** keywords were added.
12.4	Support was added to **hung-pu-awareness**, **hung-session-awareness**, and **locate-timeout** keywords.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

Usage Guidelines You can also deactivate SNASw without removing the **snasw cpname** definition by using the **snasw stop** privileged EXEC command which enables you to stop and restart SNASw without losing the SNASw configuration. If you use **no snasw cpname**, all SNASw configuration commands that were entered will be lost.

Coding a CP name is required for SNASw. Only one **snasw cpname** command is allowed at a time. You cannot change the **snasw cpname** command without first deleting the previous definition by using the **no** form of the command. If SNASw is active, the **no** form deactivates it. If SNASw is inactive, using **snasw cpname** activates it.

Examples The following are examples of how to configure the **snasw cpname** command:

```
snasw cpname NETA.BRANCH5
snasw cpname NETBANK2.DLUR0005
snasw cpname NETWORKA hostname
snasw cpname NETA.CP ip-address Loopback0
```

snasw dlcfilter

To filter frames being captured, use the **snasw dlcfilter** global configuration command. To disable the filtering of frames arriving and leaving SNASw, use the **no** form of this command.

> **snasw dlcfilter** [**link** *linkname* [**session** *session-address*]] [**port** *portname*] [**rmac** *mac-address-value* [**session** *session-address*]] [**rtp** *rtp-name* [**session** *session-address*]] [**type** [**cls**] [**hpr-cntl**] [**hpr-data**] [**isr**] [**xid**]]

> **no snasw dlcfilter**

Syntax Description		
link *linkname* [**session** *session-address*]	(Optional) Specifies the link name upon which the DLC trace is filtered (one to eight characters). All incoming and outgoing frames matching this link are traced.
port *portname*	(Optional) Specifies the port name upon which the port is filtered (one to eight characters). All incoming and outgoing frames matching this port are traced.
rmac *mac-address-value* [**session** *session-address*]	(Optional) Specifies the MAC address upon which the DLC trace is filtered. All incoming and outgoing frames matching this MAC address are traced.
rtp *rtp-name* [**session** *session-address*]	(Optional) Specifies the RTP name upon which the RTP is filtered (one to eight characters). All incoming and outgoing frames matching this RTP connection name are traced.
type	(Optional) Indicates that one or more frame type filters follow. Use the **type** operand to further refine the filter to specify one or more frame types.
cls	(Optional) Indicates that commands to the local DLC are traced.
hpr-cntl	(Optional) Indicates that the HPR format identifier 5 (FID5), which does not carry an SNA data payload, is traced.
hpr-data	(Optional) Indicates that the HPR format identifier 5 (FID5), which carry an SNA data payload, is traced.
isr	(Optional) Indicates that the SNA and APPN format identifier 2 (FID2) are traced.
xid	(Optional) Indicates that the XID frames are traced.

Defaults This command defaults to no filtering, and all frames are traced.

Command Modes Global configuration

Command History

Release	Modification
12.0(5)XN	This command was introduced.
12.0(7)T	This command was integrated into Cisco IOS Release 12.0 T.

Usage Guidelines   The **snasw dlcfilter** command is typically used to limit the output of the **snasw dlctrace** command to a manageable amount of trace data. Running the **snasw dlctrace** consumes CPU and memory. Using the **snasw dlctrace** command limits the CPU and memory consumption to only the frames that are targeted for tracing.

Up to four different types of filters can be in place at once. If multiple filters are coded for all filters except the type filter, the frame only has to pass a single filter to be included in the trace. If the type filter is coded, the frame must pass the type filter and at least one of the other filters that is coded to be included in the trace.

Examples   The following are examples of how to configure the **snasw dlcfilter** command:

```
snasw dlcfilter link cmc1link
snasw dlcfilter rmac 4001.1234.1001
snasw dlcfilter type xid
```

Related Commands

Command	Description
snasw dlctrace	Traces frames arriving and leaving SNASw.
debug snasw dlc	Displays real-time DLC trace data to the console.
snasw dump	Copies problem determination logs and traces from internal buffers to an external file server.

snasw dlctrace

To trace frames arriving and leaving SNASw, use the **snasw dlctrace** global configuration command. To deactivate the capture of frame data and free the storage buffer used to capture the data, use the **no** form of this command.

> **snasw dlctrace** [**buffer-size** *buffer-size-value*] [**file** *filename* [**timestamp**]] [**frame-size** *frame-size-value* | **auto-terse**] [**format** [**brief** | **detail** | **analyzer**]] [**nostart**]

> **no snasw dlctrace**

Syntax Description

buffer-size *buffer-size-value*	(Optional) Specifies the size (in kilobytes) of the DLC trace buffer requested. The minimum buffer size is 100, while the maximum is 16000.
file *filename*	(Optional) Specifies the file name for the DLC trace buffer file when writing this file to the file server. Use the following format: protocol://host/path/filename.
timestamp	(Optional) Appends the current date and time to the end of the file when it is dumped.
frame-size *frame-size-value*	(Optional) Indicates the size of the frame that is traced within the DLC trace. All data beyond the size value are truncated and are not included in the trace. The default is that the entire frame is traced.
auto-terse	(Optional) Indicates LU-LU and SSCP-LU session data frames should be truncated after the SNA RH. Also truncates NMVTs on the SSCP-PU session. Control frames (for example, XID, BIND, ACTPU) are traced in their entirety.
format	(Optional) Indicates the format the DLC trace is written to when writing to a file server. Valid values are **brief**, **detail**, and **analyzer**: • **brief**—Indicates a text file is written with a one-line-per-frame summary for each frame. • **detail**—Indicates a text file is written with a frame summary line followed by a complete hexadecimal dump of the frame. • **analyzer**—Indicates a binary file is generated that is readable by several popular network analyzer products. This format uses the Network Associates Sniffer file format.
nostart	(Optional) Indicates that the specified trace is not to be started when the subsystem is started.

Defaults

Tracing is off.

If a value for the *buffer-size-value* argument is not specified, then the default is 500, creating a 500 KB buffer.

Command Modes

Global configuration

Command History	Release	Modification
	12.0(5)XN	This command was introduced.
	12.0(7)T	This command was integrated into Cisco IOS Release 12.0 T.

Usage Guidelines

Use the **snasw dlctrace** command when directed by service personnel or when analysis of frame data entering and leaving SNASw is necessary.

The **snasw dlctrace** command copies frames into a memory buffer, which can degrade router performance. Therefore, care should be taken when using this command. When issued on a highly used system, the **snasw dlcfilter** command should be used in conjunction with the **snasw dlctrace** command to limit the output of the trace.

Use the **snasw dump** command to dump the trace data to a file server or the **show snasw dlctrace** command to display captured frames on the console.

When using the analyzer format, portions of the frame are reconstructed from their actual representation on the data link. Because of this format, portions of the data in the header portion of the frame are modified. Specifically, if there was routing information field (RIF) data present on the actual data-link frame, that information is omitted in the dlctrace. In addition, information in the LLC header (for example, Nr, Ns counts) are not reliably transferred to the traced frame. However, the remainder of the frame, including all SNA content, is a reliable representation of the frame as it appeared on the actual upstream or downstream link.

Examples

The following are examples of how to configure the **snasw dlctrace** command:

```
snasw dlctrace
snasw dlctrace buffer-size 5000 file tftp://171.69.120.21/dlcfiles/dlc/trc
```

Related Commands

Command	Description
snasw dlcfilter	Filters frames being captured.
snasw dump	Copies problem determination logs and traces from internal buffers to an external file server.
show snasw dlctrace	Displays the captured DLC trace information on the console.

snasw dlus

To specify parameters related to DLUR/DLUS functionality, use the **snasw dlus** global configuration command. To remove the data specified in a previous **snasw dlus** command, use the **no** form of this command.

> **snasw dlus** *primary-dlus-name* [**backup** *backup-dlus-name*] [**prefer-active**] [**retry** *interval count*] [**once**]

> **no snasw dlus**

Syntax Description		
	primary-dlus-name	Specifies the fully qualified name of the primary DLUS (3 to 17 characters).
	backup *backup-dlus-name*	(Optional) Indicates configuration of a backup DLUS. A backup DLUS is used when the primary DLUS is unreachable or cannot service a specific downstream device. The fully qualified name of the backup DLUS is 3 to 17 characters in length.
	prefer-active	(Optional) Indicates that if an active DLUS/DLUR connection was established, an incoming PU will retry exclusively on the active DLUS connection and will not attempt to connect to a different DLUS.
	retry *interval count*	(Optional) Indicates that the DLUR retry parameters follow this statement. The *interval* argument indicates the time period between attempts to connect a DLUS if one is not serving a specific PU. The *count* argument indicates the number of times the current or primary DLUS is retried before an attempt is made to connect to a backup or inactive DLUS.
	once	(Optional) Instructs the DLUR to attempt only one retry cycle (with primary and backup (if configured) DLUS, according to either the default retry values or to the retry values specified by the **retry** keyword) to request DLUS services. If the service requests are not answered, the downstream link will be disconnected.

Defaults   If the **prefer-active** argument is not specified, each connected downstream station will attempt to connect to the primary DLUS or backup DLUS until the device receives DLUS services.

Command Modes   Global configuration

Command History	Release	Modification
	12.0(5)XN	This command was introduced.
	12.0(7)T	This command was integrated into Cisco IOS Release 12.0 T.

Usage Guidelines   Only one **snasw dlus** command is allowed at a time. The **snasw dlus** command cannot be changed without first deleting the previous definition using the **no** form of the command.

The **prefer-active** keyword supersedes the **once** keyword, which means that if the **prefer-active** keyword is configured and there is an active DLUS, then all DLUS services requests will be negotiated only with the active DLUS. The DLUR will not send DLUS service requests to other DLUSs. In this situation, the **once** keyword has no effect.

Examples   The following are examples of how to configure the **snasw dlus** command:

```
snasw dlus NETA.HOST1 backup NETA.HOST2
snasw dlus NETBANK2.CDERM34 prefer-active retry 30 3
```

Related Commands

Command	Description
show snasw dlus	Displays the SNASw DLUS objects.

snasw dump

To copy problem determination logs and traces from internal buffers to an external file server, use the **snasw dump** privileged EXEC command.

snasw dump all | **dlctrace** | **ipstrace** | **summary-ipstrace** | **pdlog**

Syntax Description

all	Indicates all configured trace and problem determination buffers should be transferred. The **file** operand must be configured on the enabling configuration command for the buffers to be dumped. Traces that run but do not have the **file** operand coded are not transferred.
dlctrace	Indicates the DLC trace buffer is transferred to a file server. If **file** is configured on the **snasw dlctrace** command, the URL specified is used for transferring the DLC trace file. If **file** is not configured on the **snasw dlctrace** command, the transfer protocol defaults to TFTP, and the user is prompted for the remote host and file name for the transferred file.
ipstrace	Indicates the IPS trace buffer is transferred to a file server. If **file** is configured on the **snasw ipstrace** command, the URL specified is used for transferring the ipstrace file. If **file** is not configured on the **snasw ipstrace** command, the transfer protocol defaults to TFTP, and the user is prompted for the remote host and file name for the transferred file.
summary-ipstrace	Indicates the summary IPS trace buffer is transferred to a file server. If **file** is coded on the **snasw summary-ipstrace** command, the URL specified is used for transferring the summary ipstrace file. If **file** is not coded on the **snasw ipstrace** command, the transfer protocol defaults to TFTP, and the user is prompted for the remote host and file name for the transferred file.
pdlog	Indicates the problem determination log buffer is transferred to a file server. If **file** is coded on the **snasw pdlog** command, the URL specified is used for transferring the pdlog file. If **file** is not coded, the transfer protocol defaults to TFTP, and the user is prompted for the remote host and file name for the transferred file.

Defaults   No default behavior or values.

Command History

Release	Modification
12.0(5)XN	This command was introduced.
12.0(7)T	This command was integrated into Cisco IOS Release 12.0 T.

Usage Guidelines The **snasw dump** command is used for gathering trace files for diagnosis by Cisco personnel or onsite trace analysis.

TFTP can handle files up to 16 Mb. If you are transferring a file larger than 16 Mb, do not use TFTP. Instead, use FTP or some other file transfer method. To change the transmission protocol, use the **file** keyword under the **snasw trace** configuration (for example, **snasw dlctrace**).

When you use FTP, make sure you configure **ip ftp username** and **ip ftp password** to a valid user and password on the system to which the file is being sent.

Examples The following are examples of how to enter the **snasw dump** command:

```
snasw dump all
snasw dump dlctrace
```

Related Commands

Command	Description
snasw dlctrace	Traces frames arriving and leaving SNASw.
snasw ipstrace	Sets up a trace buffer and begins tracing IPS trace elements.
snasw pdlog	Controls message logging to the console and the SNA problem determination log cyclic buffer.

snasw event

To indicate which normal events are logged to the console, use the **snasw event** global configuration command. To return the events to their default state, use the **no** form of this command.

> **snasw event** [**cpcp**] [**dlc**] [**implicit-ls**] [**port**]

> **no snasw event**

Syntax Description

cpcp	(Optional) Indicates that an event is issued for CP-CP session state changes.
dlc	(Optional) Indicates DLC state changes.
implicit-ls	(Optional) Indicates state change on implicit links, including connection network links.
port	(Optional) Indicates that an event is issued for port state changes.

Defaults   By default, only defined links and DLUS events are sent to the pdlog/console.

Command Modes   Global configuration

Command History

Release	Modification
12.0(5)XN	This command was introduced.
12.0(7)T	This command was integrated into Cisco IOS Release 12.0 T.
12.1(6)	The **defined-ls** keyword was deleted.

Examples   The following example shows how to configure the **snasw event** command:

```
snasw event implicit-ls
```

snasw ip-precedence

To define IP type of service (TOS) precedence settings to be mapped to APPN priorities, use the **snasw ip-precedence** global configuration command. To remove the precedence settings, use the **no** form of this command.

> **snasw ip-precedence link** *link-setting* **network** *network-setting* **high** *high-setting* **medium** *medium-setting* **low** *low-setting*

> **no snasw ip-precedence link** *link-setting* **network** *network-setting* **high** *high-setting* **medium** *medium-setting* **low** *low-setting*

Syntax Description

link *link-setting*	TOS precedence setting (0-7) mapped to link control (LDLC) priority.
network *network-setting*	TOS precedence setting (0-7) mapped to network priority.
high *high-setting*	TOS precedence setting (0-7) mapped to high priority.
medium *medium-setting*	TOS precedence setting (0-7) mapped to medium priority.
low *low-setting*	TOS precedence setting (0-7) mapped to low priority.

Defaults   No default behavior or values.

Command Modes   Global configuration

Command History

Release	Modification
12.2	This command was introduced.

Examples   The following is an example of how to configure the **snasw ip-precedence** command:

```
snasw ip-precedence link 7 network 7 high 7 medium 7 low 7
```

snasw ipsfilter

To filter interprocess signal trace elements being traced using the **snasw ipstrace** or **debug snasw ips** commands, use the **snasw ipsfilter** global configuration command. To remove all filtering, use the **no** form of this command.

> **snasw ipsfilter** [**as**] [**asm**] [**bm**] [**ch**] [**cpc**] [**cs**] [**di**] [**dlc**] [**dma**] [**dr**] [**ds**] [**es**] [**ha**] [**hpr**] [**hs**] [**lm**] [**mds**] [**ms**] [**nof**] [**pc**] [**ps**] [**pu**] [**px**] [**rm**] [**rtp**] [**ru**] [**scm**] [**sco**] [**sm**] [**spc**] [**ss**] [**trs**]

> **no snasw ipsfilter**

Syntax Description		
	as	(Optional) Specifies a filter on the Address Space component.
	asm	(Optional) Specifies a filter on the Address Space Manager component.
	bm	(Optional) Specifies a filter on the Buffer Management component.
	ch	(Optional) Specifies a filter on the Channel component.
	cpc	(Optional) Specifies a filter on the CPI-C component.
	cs	(Optional) Specifies a filter on the Configuration Services component.
	di	(Optional) Specifies a filter on the Defect Indication component.
	dlc	(Optional) Specifies a filter on the Data Link Control component.
	dma	(Optional) Specifies a filter on the Direct Memory Access component.
	dr	(Optional) Specifies a filter on the Dependent LU Requester component.
	ds	(Optional) Specifies a filter on the Directory Services component.
	es	(Optional) Specifies a filter on the End System component.
	ha	(Optional) Specifies a filter on the High Availability component.
	hpr	(Optional) Specifies a filter on the High-Performance Routing component.
	hs	(Optional) Specifies a filter on the Half Session component.
	lm	(Optional) Specifies a filter on the LU Manager component.
	mds	(Optional) Specifies a filter on the Management Data Stream component.
	ms	(Optional) Specifies a filter on the Management Services component.
	nof	(Optional) Specifies a filter on the Node Operator Facility component.
	pc	(Optional) Specifies a filter on the Path Control component.
	ps	(Optional) Specifies a filter on the Presentation Services component.
	pu	(Optional) Specifies a filter on the PU Manager component.
	px	(Optional) Specifies a filter on the PU Concentration component.
	rm	(Optional) Specifies a filter on the Resource Manager component.
	rtp	(Optional) Specifies a filter on the Rapid Transport Protocol component
	ru	(Optional) Specifies a filter on the Request Unit Interface component.
	scm	(Optional) Specifies a filter on the Session Connect Manager component.
	sco	(Optional) Specifies a filter on the Session Connector component.
	sm	(Optional) Specifies a filter on the Session Manager component.
	spc	(Optional) Specifies a filter on the Serial Protocol Channel component.
	ss	(Optional) Specifies a filter on the Session Services component.
	trs	(Optional) Specifies a filter on the Topology Routing Services component.

Defaults   No default behavior or values.

Command Modes   Global configuration

Command History

Release	Modification
12.0(5)XN	This command was introduced.
12.0(7)T	This command was integrated into Cisco IOS Release 12.0 T.

Usage Guidelines   The command defaults to no IPS trace filtering.

Examples   The following is an example of how to configure the **snasw ipsfilter** command:

```
snasw ipsfilter ds ss
```

Related Commands

Command	Description
snasw ipstrace	Sets up a trace buffer and begins tracing IPS trace elements.
show snasw ipstrace	Displays the interprocess signal trace on the router console.
debug snasw ips	Displays realtime ipstrace information to the console.

snasw ipstrace

To set up a trace buffer and begin tracing IPS trace elements, use the **snasw ipstrace** global configuration command. To turn off the capture of trace elements and to free the trace buffer, use the **no** form of this command.

> **snasw ipstrace** [**buffer-size** *buffer-size-value*] [**file** *filename* **timestamp**]

> **no snasw ipstrace**

Syntax Description

buffer-size *buffer-size-value*	(Optional) Indicates that this trace command controls the size of the buffer used for storing ipstrace elements (in kilobytes). The default is 500 KB. The minimum buffer size if 10 KB; the maximum is 16000 KB.
file *filename*	(Optional) Specifies the file name for the IPS trace buffer file when writing this file to the server.
timestamp	(Optional) Appends the current date and time to the end of the file when it is dumped.

Defaults   This command defaults to no tracing with no cyclic buffer allocated.

Command Modes   Global configuration

Command History

Release	Modification
12.0(5)XN	This command was introduced.
12.0(7)T	This command was integrated into Cisco IOS Release 12.0 T.

Usage Guidelines   Use the **snasw ipstrace** command when directed by SNASw personnel.

The **snasw ipstrace** command copies frames into a memory buffer, which can affect router performance. Therefore, care should be taken when using this command.

The ipstrace information is stored in a cyclic buffer allocated out of main processor memory. Use the **snasw dump** command to dump the binary trace information to a file server or the **show snasw ipstrace** command to display captured IPS trace information to the console. The IPS trace is a low-level internal trace.

Examples   The following is an example of how to configure the **snasw ipstrace** command:

```
snasw ipstrace buffer-size 1000 file tftp://myhost/path/file
```

Related Commands	Command	Description
	snasw ipsfilter	Filters interprocess signal trace elements being traced using the **snasw ipstrace** or **debug snasw ips** commands.
	show snasw ipstrace	Displays interprocess signal trace on the router console.
	debug snasw ips	Displays realtime IPS trace information to the console.

snasw link

To configure upstream links, use the **snasw link** global configuration command. To remove the configuration of upstream links, use the **no** form of this command.

> **snasw link** *linkname* **port** *portname* **rmac** *mac-address* | **ip-dest** *ip-address* [**rsap** *sap-value*] [**nns**] [**tgp** [**high** | **low** | **medium** | **secure**]] [**nostart**]

> **no snasw link** *linkname*

Syntax Description		
linkname		Indicates the one-to-eight character local name for this link. This name is used to identify the link in **show** and privileged EXEC commands.
port *portname*		Specifies the SNASw port from which this link will connect.
rmac *mac-address*		Specifies the 48-bit MAC address of the destination station. Either this operand or **ip-dest** is required. RMAC is required for all links associated with ports that are not HPR/IP ports.
ip-dest *ip-address*		Indicates the IP address or DNS name of the destination stations. Either this operand or **rmac** is required. For all links associated with HPR/IP ports, **ip-dest** is required.
rsap *sap-value*		(Optional) Indicates the destination SAP value, which defaults to 4.
nns		(Optional) Configures the adjacent Control Point (CP) as a preferred Network Node Server (NNS). You can specify the **nns** keyword on more than one link to identify multiple preferred NNSs.
tgp		(Optional) Configures a Transmission Group (TG) characteristic profile for route calculation. All SNASw TGs have the following characteristics in common: • Capacity = 16 megabits per second • Propagation delay = 384 microseconds • User parameter 1 = 128 • User parameter 2 = 128 • User parameter 3 = 128 However, you can adjust the connect cost, byte cost and security TG characteristics. Valid values are **high**, **low**, **medium**, and **secure**.
high		(Optional) Prefers this link over links with a TG profile of **medium** or **low**. With this TG profile you can have the following TG characteristics: • Connect cost = 0 • Byte cost = 0 • Security = Nonsecure
low		(Optional) Prefers this link when links with a TG profile of **high** or **medium** are not available. With this TG profile you can have the following TG characteristics: • Connect cost = 255 • Byte cost = 255 • Security = Nonsecure

medium	(Optional) Prefers this link when links with a TG profile of **high** are not available. With this TG profile you can have the following TG characteristics:
	• Connect cost = 196
	• Byte cost = 196
	• Security = Nonsecure
secure	(Optional) Prefers this link when a secure TG is required by the APPN class-of-service in use. With this TG profile you can have the following TG characteristics:
	• Connect cost = 196
	• Byte cost = 196
	• Security = Secure public switched network
nostart	(Optional) Indicates that the link will not start automatically when defined.

Defaults   The destination SAP value defaults to 4.

The default TG characteristic profile is medium and non-secure.

Command Modes   Global configuration

Command History

Release	Modification
12.0(5)XN	This command was introduced.
12.0(7)T	This command was integrated into Cisco IOS Release 12.0T.

Usage Guidelines   Use the **snasw link** command to configure upstream connections to SNA data hosts, services, and DLUS nodes. Do not use this command to establish downstream connections to client workstations and devices that are serviced by the SNA switch. Configure client workstations and devices to connect into the SNA switch by configuring an outbound connection on these devices that specifies the MAC address of a port that is active on SNASw. SNASw then creates the downstream link dynamically when the workstation or device connects to SNASw.

If using the **ip-dest** keyword and using a DNS name instead of an IP address, the DNS name is resolved to an IP address at the time the definition is entered (or the time SNASw is started) and will remain resolved to that same address for the duration that SNASw is active. The DNS name is not resolved to an IP address each time the link is restarted.

If the link fails and SNASw switches to a non-preferred NNS (one without the **nns** keyword configured), SNASw will return CP-CP sessions to the preferred NNS when the NNS link becomes active again. Also, when the **nns** keyword is configured on a link, that link can be automatically restarted, even after the **snasw stop link** command is issued. See the **snasw stop link** command for details.

Examples   The following are examples of how to configure the **snasw link** command:

```
snasw link LINKCMC1 port TOKEN0 rmac 4000.333.4444 rsap 8
snasw link HOSTIP port HPRIP ip-dest 172.18.3.44
```

Related Commands	Command	Description
	show snasw link	Shows the SNASw link objects.
	snasw port	Specifies the DLCs used by SNASw.

snasw location

To configure the location of a resource, use the **snasw location** global configuration command. To disable the location of a resource, use the **no** form of this command.

snasw location *resource-name* **owning-cp** *cpname*

no snasw location *resource-name*

Syntax Description

resource-name	Indicates the fully qualified name of the resource for which location information is being configured (3 to 17 characters).
owning-cp *cpname*	Indicates the fully qualified CP name where the resource resides.

Defaults

No default behaviors or values.

Command Modes

Global configuration

Command History

Release	Modification
12.0(5)XN	This command was introduced.
12.0(7)T	This command was integrated into Cisco IOS Release 12.0 T.
12.2	Support for wildcards in the *cpname* argument was added.

Usage Guidelines

The **snasw location** command is typically used when a LEN node link is established with a destination LU. The **snasw location** command allows SNASw to route session requests over the LEN node link to the resources named.

When a LEN node connects into an SNASw node, SNASw dynamically learns the CP name of the LEN and places it in its directory. In addition, SNASw dynamically learns the LU names of all LUs on the LEN that initiate independent sessions. Only define the location when an ILU on a LEN device is not sharing the node's CP name and does not initiate the first session. In all other cases the LU's location will be learned dynamically.

The directory entry is created the next time the LEN node connects in. If there is already a link to the LEN node active and you add a new snasw location statement, it will not take effect until the next time the LEN CP connects in.

Do not use the **snasw location** command to predefine the location of any resource that can be found dynamically using APPN searches (for example, resources on upstream APPN nodes or upstream/downstream ENs).

It is permissible to use the wildcard character "*****" in location definitions to allow a definition to generate name associations for multiple devices. When using the wildcard character for this purpose, the ***** symbol must be coded in both the *resource-name* and the *cpname*. If any real device attaches with a CP name that matches the non-wildcard portion of the **owning-cp** *cpname* specified, a location association will be made that replaces the wildcard characters of the CPname in the position of the *resource-name*. For example, if a definition **snasw location NETA.LU*01 owning-cp NETA.CP*** is coded and CP with the name NETA.CPABCD connects in, then the resource name NETA.LUABCD01 will be defined to SNASw with owning-cp NETA.CPABCD.

You can also use the wildcard character "*****" in location definitions to allow a specific device to connect under different CP names, but a single device cannot connect under multiple CP names at the same time. In this case, the ***** symbol must be used in only the *cpname* argument and not the *resource-name* argument. When the device connects with a CP name that matches the non-wildcard portion of the *cpname* argument, a corresponding location association will be made for the *resource-name* with that CP name.

Examples   The following is an example of how to configure the **snasw location** command:

```
snasw location NETA.INDEPLU owning-cp NETA.LENHOSTA
```

Related Commands

Command	Description
show snasw directory	Displays the SNASw directory entries.

snasw mode

To define a new mode and associate it with an existing class of service (COS), use the **snasw mode** global configuration command. To delete the mode, use the **no** form of this command.

> **snasw mode** *mode* **cos** *cos*

> **no snasw mode** *mode* **cos** *cos*

Syntax Description

mode	Name of the new mode.
cos *cos*	Name of an existing COS, such as #INTER.

Defaults

No default behavior or values.

Command Modes

Global configuration

Command History

Release	Modification
12.2	This command was introduced.

Examples

The following is an example of how to configure the **snasw mode** command:

```
snasw mode abcmode cos #INTER
```

snasw msgdump

To enable automatic dumping of the DLC trace, IPS trace, and problem determination log when a specified SNA Switching Services (SNASw) message is displayed, use the **snasw msgdump** global configuration command. To disable automatic dumping, use the **no** form of this command.

snasw msgdump *message*

no snasw msgdump *message*

Syntax Description

message	SNASw message to trigger the automatic dump.

Defaults

No default behavior or values.

Command Modes

Global configuration

Command History

Release	Modification
12.2	This command was introduced.

Examples

The following are examples of the **snasw msgdump** command:

```
snasw msgdump %SNASW-6-CS_LOG_60
```

snasw pathswitch

To force an HPR pathswitch for an RTP connection, use the **snasw pathswitch** privileged EXEC command.

> **snasw pathswitch** [*rtp-connection-name* | **all**]

Syntax Description

rtp-connection-name	(Optional) Specifies the RTP connection to path-switch. This is an eight-byte string. You can obtain the value for the *rtp-connection-name* argument from the **show snasw rtp** command.
all	(Optional) Specifies that a pathswitch operation will be initiated for every RTP connection managed by the local node.

Defaults

No default behaviors or values.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.0(5)XN	This command was introduced.
12.0(7)T	This command was integrated into Cisco IOS Release 12.0 T.

Usage Guidelines

If a specific connection name is coded, and no such connection is known to SNASw, the **snasw pathswitch** command is ignored, and a message is issued. Use the **snasw pathswitch** command to force an HPR pathswitch for sessions that use this node as an RTP endpoint.

Use the **snasw pathswitch** command if you want to force a switch back to a primary route when it recovers, and the session seems to be hung.

There is not a **no** form for this command.

Examples

The following is an example of how to execute the **snasw pathswitch** command:

```
snasw pathswitch @R000006
```

Related Commands

Command	Description
show snasw rtp	Displays the SNASw RTP connections.

snasw pdlog

To control message logging to the console and the SNA problem determination log cyclic buffer, use the **snasw pdlog** global configuration command. To remove previous pdlog configurations, use the **no** form of this command.

snasw pdlog [**problem** | **exception** | **info**] [**buffer-size** *buffer-size-value*] [**file** *filename* **timestamp**]

no snasw pdlog

Syntax Description

problem	(Optional) Indicates that only problem records are sent to the console. This is the default.
exception	(Optional) Indicates that both problems and exceptions are sent to the console.
info	(Optional) Indicates that informational messages and problems and exceptions are sent to the console.
buffer-size *buffer-size-value*	(Optional) Indicates the size of the pdlog buffer requested (in kilobytes). The default is 500 KB. The minimum is 10 KB, and the maximum is 16000 KB.
file *filename*	(Optional) Indicates the URL for writing the pdlog file to a server. Use the following format: *protocol://host/path/filename*.
timestamp	(Optional) Appends the current date and time to the end of the file when it is dumped.

Defaults

If not coded, the **snasw pdlog** command defaults to an active 500 KB cyclic buffer. Problems, exceptions, and informational messages are always sent to the buffer. By default, only problems go to the console.

Command Modes

Global configuration

Command History

Release	Modification
12.0(5)XN	This command was introduced.
12.0(7)T	This command was integrated into Cisco IOS Release 12.0 T.

Usage Guidelines

Use the **snasw pdlog** command to customize the type of information you prefer to see on the router console from the SNASw feature.

Examples

The following is an example of how to configure the **snasw pdlog** command:

```
snasw pdlog exception buffer-size 200 file tftp://my host/files/trace.pdlog
```

Related Commands	Command	Description
	show snasw pdlog	Displays entries in the cyclical problem determination log to the console.
	snasw dump	Copies problem determination logs and traces from internal buffers to an external file server.

snasw port

To specify the Data-link controls (DLCs) used by SNA Switching Services (SNASw), use the **snasw port** command in global configuration mode. To delete a previously configured port, use the **no** form of this command.

HPR-IP Ports

> **snasw port** *port-name* **hpr-ip** *interface-name* [**ldlc** [*liveness-time t1-retry-time t1-retry-count*]] [**maxbtu** *max-btu-size*] [**vnname** *virtual-node-name*] [**nostart**]
>
> **no snasw port** *port-name*

VDLC and Virtual Token Ring Ports

> **snasw port** *port-name* {**vdlc** *ring-group* **mac** *mac-address* | *virtual-TokenRing-interface-name*} [**conntype nohpr** | **len** | **dyncplen**] [**hpr-sap** *hpr-sap-value*] [**max-links** *link-limit-value*] [**maxbtu** *max-btu-size*] [**nns-required**] [**sap** *sap-value*] [**vnname** *virtual-node-name*] [**nostart**]
>
> **no snasw port** *port-name*

All Other Types of Ports

> **snasw port** *port-name interface-name* [**conntype nohpr** | **len** | **dyncplen**] [**nns-required**] [**hpr-sap** *hpr-sap-value*] [**max-links** *link-limit-value*] [**maxbtu** *max-btu-size*] [**sap** *sap-value*] [**vnname** *virtual-node-name*] [**nostart**]
>
> **no snasw port** *port-name*

Syntax Description	
port-name	The one- to eight-character name for the port. This argument is used to refer to this port in informational messages and the **show snasw port** command.
interface-name	The name of the interface over which the port will communicate. Allowable interfaces are Token Ring, Ethernet, VLAN, or loopback.
hpr-ip	Indicates that the port is High-Performance Routing (HPR)/IP.
ldlc	(Optional) Overrides the default Logical Data Link Control (LDLC) parameters for all links which use the port. This keyword allows the LDLC parameters for SNASw links to be configured to match those at the other Rapid Transport Protocol (RTP) endpoint, which is often a host z/OS or CS/390.
liveness-time	(Optional) Number of seconds for the liveness timer. This parameter matches the z/OS or CS/390 LIVTIME keyword. The allowed range is from 5 to 25 seconds, and the default is 2 seconds.
t1-retry-time	(Optional) Number of seconds between T1 retry attempts. This parameter matches the z/OS or CS/390 SRQTIME keyword. The allowed range is from 3 to 20 seconds, and the default is 2 seconds.
t1-retry-count	(Optional) Number of times to retry before the HPR-IP TG becomes inoperative. This parameter matches the z/OS or CS/390 SRQRETRY keyword. The allowed range is from 3 to 9 retries, and the default is 10 retries.

maxbtu *max-btu-size*	(Optional) Indicates the maximum basic transmission unit (BTU) size for the remote end (both inbound and outbound). This value is used in XID3 negotiation. The valid range is from 1 to 17800.
vnname *virtual-node-name*	(Optional) Indicates the network qualified virtual node name 3 to 17 characters) of the connection network being defined.
nostart	(Optional) Indicates that the port will not open automatically when defined.
vdlc *ring-group*	Indicates that the port is virtual data-link control (VDLC). No *interface-name* argument is required. The *ring-group* argument indicates the source-bridge ring group of which this VDLC port is a member.
mac *mac-address*	Indicates the virtual source MAC address used for the VDLC port.
virtual-TokenRing-interface-name	Indicates the name of the virtual Token Ring interface.
conntype nohpr | len | dyncplen	(Optional) The **conntype** keyword indicates the connection type for the port. The connection type can be set to one of three values: **nohpr**, **len**, or **dyncplen**. If this keyword is not configured, HPR-capable links are established. The **nohpr** keyword indicates that the HPR is not supported but Advanced Peer-to-Peer Networking (APPN) connections with control point (CP)-CP sessions are permitted. The **len** keyword indicates that APPN connections are not allowed; only low-entry networking node (LEN) node-level connectivity is negotiated. The **dyncplen** keyword (similar to LEN node in functionality) also replaces the **cpname** keyword. This option is specifically intended for users with XID3-capable devices that send CP names, but whose CP names configured on these devices have not been configured uniquely across the devices. Therefore, a default **cpname** must be generated to have a properly functioning APPN connection management and directory function.
hpr-sap *hpr-sap-value*	(Optional) Indicates the local HPR-service access point (SAP) value.
max-links *link-limit-value*	(Optional) Indicates the number of links permitted on this port. When this link limit is reached, the port will not respond to inbound connection requests from stations attempting to connect to this port. Outbound connections are still permitted. The **max-links** can be coded only on VDLC and Virtual Token Ring port types.
maxbtu *max-btu-size*	(Optional) Indicates the maximum basic transmission unit (BTU) size for the remote end (both inbound and outbound). This value is used in XID3 negotiation. The valid range is from 1 to 17800.

nns-required	(Optional) Enables configurations with redundant downstream MAC addresses to only allow SNASw nodes that have appropriate upstream connectivity to accept and retain connections from downstream devices.

- When a port is configured with the **nns-required** keyword, the port does not respond to downstream connection requests unless this SNASw node has active CP-CP sessions to an upstream network management system (NNS).

- If a connection has already been made through this SNASw node and then upstream NNS CP-CP connectivity is lost, this SNASw node deactivates all non-HPR links using this port that do not have active logical unit (LU)-LU or Intermediate Session Routing (ISR) sessions.

> **Note** This keyword is relevant only for ports that will be accepting downstream connections from devices. It is not relevant for upstream ports.

sap *sap-value*	(Optional) Indicates the local SAP (LSAP) value.

Defaults No default behaviors or values.

Command Modes Global configuration

Command History

Release	Modification
12.0(5)XN	This command was introduced.
12.0(7)T	This command was integrated into Cisco IOS Release 12.0 T.

Usage Guidelines More than one port can be configured (with different port names). A configured port cannot be redefined without first deleting the port using the **no** form of the port command.

> **Note** Two ports cannot be defined on the same interface unless different values are configured for the 'sap' and 'hrp-sap' keywords on the ports.

> **Note** SNASw ports do not dynamically adjust to interface configuration changes that are made when SNASw is active. For example, if you change an interface MAC address or MTU, SNASw may not recognize the new value. If you want to make changes to an interface and want SNASw to adjust to the new interface changes, you may need to either delete and redefine the port that is using that interface or stop and restart SNASw.

The interface must be defined before the ports that use them are defined and activated.

SNASw does not support EtherChannel interfaces (neither port-channel interfaces nor Fast Ethernet interfaces configured with the **channel-group** command). Do not try to configure a SNASw port with either of these EtherChannel interface types.

Examples   The following are examples of how to configure the **snasw port** command:

```
snasw port SRBG Virtual-TokenRing0 conntype nohpr
snasw port UPSTREAM TokenRing1/1
snasw port dlswport vdlc 30 mac 4000.33333.4444
snasw port HPRIP hpr-ip Loopback0
snasw port TRVLAN Vlan1/1 vnname NETA.CONNET
```

Related Commands

Command	Description
snasw link	Configures upstream links.
show snasw port	Displays the SNASw port objects.

snasw rtp pathswitch-timers

To tune the Realtime Transport Protocol (RTP) path-switch timers for an SNASwitch, use the **snasw rtp pathswitch-timers** command in global configuration mode. To restore the default settings for the RTP path-switch timers, use the **no** form of this command.

snasw rtp pathswitch-timers *low-priority medium-priority high-priority network-priority*

no snasw rtp pathswitch-timers

Syntax Description		
	low-priority	Number of seconds to attempt path switch for low-priority RTPs. Allowed values are from 5 to 65535 seconds.
	medium-priority	Number of seconds to attempt path switch for medium-priority RTPs. Allowed values are from 5 to 65535 seconds.
	high-priority	Number of seconds to attempt path switch for high-priority RTPs. Allowed values are from 5 to 65535 seconds.
	network-priority	Number of seconds to attempt path switch for network-priority RTPs. Allowed values are from 5 to 120 seconds.

Defaults

low-priority: 480 seconds
medium-priority: 240 seconds
high-priority: 120 seconds
network-priority: 60 seconds

Command Modes

Global configuration

Command History	Release	Modification
	12.2	This command was introduced.

Usage Guidelines

The arguments for this command should be tuned to match the values specified at the other end of the RTP connection. This endpoint could be another SNASwitch router or any other HPR-capable control point, which will most often be an IBM z/OStm mainframe. In this case, you should match the settings of the HPRPST start option.

The value for each path-switch timer argument must be greater than or equal to the value for the next highest priority timer argument. In other words, the *low-priority* argument >= *medium-priority* argument >= *high-priority* argument >= *network-priority* argument.

Examples

The following example tunes the RTP path-switch timers:

```
router(config)# snasw rtp pathswitch-timers 160 80 40 20
```

snasw start

To start SNASw, use the **snasw start** privileged EXEC command.

snasw start

Syntax Description   This command has no arguments or keywords.

Defaults   No default behaviors or values.

Command Modes   Privileged EXEC

Command History

Release	Modification
12.0(5)XN	This command was introduced.
12.0(7)T	This command was integrated into Cisco IOS Release 12.0 T.

Usage Guidelines   If not enough memory exists to start SNASw, a message indicating lack of memory is issued. A CP name must be configured with the **snasw cpname** command before SNASw will start.

Examples   The following is an example of the **snasw start** command:

```
snasw start
```

Related Commands

Command	Description
show snasw node	Displays details and statistics of the SNASw operation.
snasw stop	Shuts down SNASw.

snasw start cp-cp

To initiate a request to start CP-CP sessions with a partner CP, use the **snasw start cp-cp** privileged EXEC command.

snasw start cp-cp *cpname*

Syntax Description

cpname	Indicates the fully qualified CP name of the adjacent node with which CP-CP sessions should be started.

Defaults   No default behaviors or values.

Command Modes   Privileged EXEC

Command History

Release	Modification
12.0(5)XN	This command was introduced.
12.0(7)T	This command was integrated into Cisco IOS Release 12.0 T.

Usage Guidelines   Use the **snasw start cp-cp** command if CP-CP sessions fail permanently or temporarily, but beyond the timeframe for automatic CP-CP session retry. If the current state of the node mandates that CP-CP sessions cannot be started to the partner (for example, CP-CP sessions already exist on a different upstream link) or no active adjacent CP matches the cpname named, the command fails.

Typically, SNASw automatically activates CP-CP sessions as necessary and the **snasw start cp-cp** command is rarely needed. Frequent CP-CP session failure beyond the timeframe for automatic session retry indicates a problem, and should be reported.

Examples   The following is an example of the **snasw start cp-cp** command:

```
snasw start cp-cp NETA.CMCHOST
```

Related Commands

Command	Description
snasw stop cp-cp	Terminates CP-CP sessions with a partner CP.

snasw start link

To start an inactive defined link, use the **snasw start link** privileged EXEC command.

snasw start link *linkname*

Syntax Description

linkname	Indicates the name of the link as configured or shown in **show snasw link**.

Defaults

No default behaviors or values.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.0(5)XN	This command was introduced.
12.0(7)T	This command was integrated into Cisco IOS Release 12.0 T.

Usage Guidelines

Use the **snasw start link** command to initiate a connection sequence for a link that is defined but not currently active. Unless **nostart** is configured on the link definition, a link is started automatically. Use this command to start links that have **nostart** configured or links that have been stopped using the **snasw stop link** privileged EXEC command.

Examples

The following is an example of the **snasw start link** command:

```
snasw start link CMCHOST1
```

Related Commands

Command	Description
show snasw link	Displays the SNASw link objects.
snasw stop link	Stops an active link.

snasw start port

To start an inactive port, use the **snasw start port** privileged EXEC command.

snasw start port *portname*

Syntax Description

| *portname* | Indicates the name of the port as configured or shown in the **show snasw port** command. |

Defaults

No default behaviors or values.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.0(5)XN	This command was introduced.
12.0(7)T	This command was integrated into Cisco IOS Release 12.0 T.

Usage Guidelines

Use the **snasw start port** command to enable a port that is defined to the configuration but is not currently active. Unless **nostart** is configured on the port definition, a port is started automatically. Use this command to start ports that have **nostart** configured or ports that have been stopped using the **snasw stop port** privileged EXEC command.

Examples

The following is an example of the **snasw start port** command:

```
snasw start port TOKEN0
```

Related Commands

Command	Description
show snasw port	Displays the SNASw port objects.
snasw stop port	Stops an active port.

snasw stop

To shut down SNASw, use the **snasw stop** privileged EXEC command.

> **snasw stop**

Syntax Description   This command has no arguments or keywords.

Defaults   No default behaviors or values.

Command Modes   Privileged EXEC

Command History

Release	Modification
12.0(5)XN	This command was introduced.
12.0(7)T	This command was integrated into Cisco IOS Release 12.0 T.

Usage Guidelines   Use the **snasw stop** command to terminate all sessions, stop all ports and links, and shut down SNASw. When you enter this command, you are prompted for confirmation.

Examples   The following is an example of the **snasw stop** command:

```
snasw stop
```

Related Commands

Command	Description
snasw start	Starts SNASw.

snasw stop cp-cp

To terminate CP-CP sessions with a partner CP, use the **snasw stop cp-cp** privileged EXEC command.

snasw stop cp-cp *cpname*

Syntax Description

cpname	Indicates the fully qualified CP name of the adjacent node with which CP-CP sessions should be stopped.

Defaults   No default behaviors or values.

Command Modes   Privileged EXEC

Command History

Release	Modification
12.0(5)XN	This command was introduced.
12.0(7)T	This command was integrated into Cisco IOS Release 12.0 T.

Usage Guidelines   If the primary NN server (uplink) fails, CP-CP sessions are established with a backup, if one is available. When the link to the primary recovers, SNASw retains the CP-CP sessions established with the backup and does not automatically switch back to the primary. To force SNASw to switch back to the primary, use the **snasw stop cp-cp** command. (If the link to the backup fails, SNASw does switch back to the primary automatically.)

You can also use the **snasw stop cp-cp** command to clear some fault scenarios, such as hung or nonresponsive CP sessions, allowing the SNA switch to potentially restart sessions with the same or alternate destination LU.

Examples   The following is an example of the **snasw stop cp-cp** command:

```
snasw stop cp-cp NETA.CMCHOST
```

Related Commands

Command	Description
snasw start cp-cp	Initiates a request to start CP-CP sessions with a partner CP.

snasw stop link

To stop an active link, use the **snasw stop link** privileged EXEC command.

snasw stop link *linkname*

Syntax Description	*linkname*	Indicates the name of the link as configured or shown in the **show snasw link** command.

Defaults   No default behaviors or values.

Command Modes   Privileged EXEC

Command History

Release	Modification
12.0(5)XN	This command was introduced.
12.0(7)T	This command was integrated into Cisco IOS Release 12.0 T.

Usage Guidelines

Use the **snasw stop link** command to deactivate a link to a specified partner CP. All non-HPR sessions established using the link are disconnected. HPR sessions are disrupted only if there is no alternate route available.

Normally a link stopped with the **snasw stop link** command must be restarted by issuing the **snasw start link** command. However, it will be automatically restarted under the following conditions:

- The **nns** keyword is specified on the **snasw link** command, and
- The SNASw CP did not already re-establish CP-CP sessions with a network node server over another upstream link.

Examples

The following is an example of the **snasw stop link** command:

```
snasw stop link CMCHOST1
```

Related Commands

Command	Description
show snasw link	Displays the SNASw link objects.

snasw stop port

To stop an active port, use the **snasw stop port** privileged EXEC command.

snasw stop port *portname*

Syntax Description

portname	Indicates the name of the port as configured or shown in the **show snasw port** command.

Defaults

No default behaviors or values.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.0(5)XN	This command was introduced.
12.0(7)T	This command was integrated into Cisco IOS Release 12.0 T.

Usage Guidelines

Use the **snasw stop port** command to disable a specified port without removing it from the configuration. All non-HPR sessions established using the port and all links are shut down on the port. HPR sessions are disrupted only if there is no alternate route available.

Examples

The following is an example of the **snasw stop port** command:

```
snasw stop port TOKEN0
```

Related Commands

Command	Description
snasw start port	Starts an inactive port.

snasw stop session

To terminate an active session, use the **snasw stop session** privileged EXEC command.

> **snasw stop session** *pcid*

Syntax Description

pcid	Procedure correlator ID in 16-digit hexadecimal form.

Defaults

No default behaviors or values.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.0(5)XN	This command was introduced.
12.0(7)T	This command was integrated into Cisco IOS Release 12.0 T.

Usage Guidelines

The **snasw stop session** command is used to clear sessions that are active but in an indeterminate or hung state or if the session partner is not responsive.

You can also use the **snasw stop session** command to free a small amount of memory if the session is no longer being used to transport data and you don't expect to use the session later.

Examples

The following is an example of the **snasw stop session** command:

```
snasw stop session C3BBD36EA9CBA1AF
```

Related Commands

Command	Description
show snasw session	Displays the SNASw session objects.