show hw-module slot tech-support through show interfaces vg-anylan

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show hw-module slot tech-support

To display system information for a SPA interface processor (SIP) or other module to troubleshoot a problem, use the **showhw-moduleslottech-support**command in privileged EXEC configuration mode.

show hw-module slot *slot* **tech-support** [**cpu** {**0** | **1**}]

Syntax Description

slot	Chassis slot number. Refer to the appropriate hardware manual for slot information. For SIPs, refer to the platform-specific SPA hardware installation guide or the corresponding "Identifying Slots and Subslots for SIPs and SPAs" topic in the platform-specific SPA software configuration guide.
cpu 0 |1	(Optional) Number of the CPU (0 or 1) for which you want to display data.

Command Default

No default behavior or values

Command Modes

Privileged EXEC

Command History

Release	Modification
12.2(18)SXE	Thiscommand was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

Usage Guidelines

Use the **showhw-moduleslottech-support** command to gather information about the SIP or other module to troubleshoot a problem. Certain error messages request that you gather this information and have it available when reporting a problem to Cisco Systems technical support personnel.

The **showhw-moduleslottech-support**command runs a collection of different **show** commands to gather information about your system environment and configuration.

The number of CPUs available varies by the type of SIP. Although the Cisco 7600 SIP-200 has two CPUs, you can display alignment data for the first CPU (CPU 0) only.

Examples

The following example shows system information for the SIP installed in slot 5 of the router:

```
Router# show hw-module slot 5 tech-support
------------------ show version ------------------
Cisco Internetwork Operating System Software
IOS (tm) cwlc Software (sip2-DW-M), Version 12.2(PIKESPEAK_INTEG_041013) INTERIM SOFTWARE
Synced to V122_18_S6, 12.2(18)S6 on v122_18_s_throttle, Weekly 12.2(18.6.4)SX
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2004 by cisco Systems, Inc.
Compiled Wed 13-Oct-04 06:55 by kchristi
Image text-base: 0x40010FC0, data-base: 0x40680000
ROM: System Bootstrap, Version 12.2(20040716:151531) [tawei-pike1 1.1dev(0.1)] DEVELOPMENT
 SOFTWARE
ROM: cwlc Software (sip2-DW-M), Version 12.2(PIKESPEAK_INTEG_041013) INTERIM SOFTWARE
SIP-400-5 uptime is 19 hours, 38 minutes
System returned to ROM by power-on
Running default software
```

```
cisco CWAN Modular Service Card (SIP-400) (SB-1) processor with 245760K/16383K bytes of
memory.
SB-1 CPU at 400Mhz, Implementation 0x401, Rev 0.3, 256KB L2 Cache
Last reset from power-on
4 ATM network interface(s)
Configuration register is 0x0
------------------ show running-config ------------------
Building configuration...
Current configuration : 13 bytes
!
!
!
!
end
------------------ show stacks ------------------
Minimum process stacks:
 Free/Size   Name
 5080/6000   SCP Find Master process
 8448/12000  Init
 5528/6000   IPC Zone Manager
 5264/6000   SCP Hybrid Registration process
 4616/6000   IPC delayed init
 5056/6000   SIP2 FPD Process
 8120/12000  Exec
 6920/12000  console_rpc_server_action
 7536/12000  RFSS_server_action
Interrupt level stacks:
Level    Called Unused/Size  Name
  1           1   7896/9000  Level 1 Interrupt
  2      116555   6136/9000  Level 2 Interrupt
  3         289   7760/9000  Level 3 Interrupt
  4       24915   8392/9000  Level 4 Interrupt
  5          67   8424/9000  Level 5 Interrupt
  7    17683668   8568/9000  NMI Interrupt Handler
------------------ show interfaces ------------------
ATM5/0/0 is administratively down, line protocol is down
  Hardware is SPA-4XOC3-ATM, address is 0000.0000.0000 (bia 0000.0000.0000)
  MTU 4470 bytes, sub MTU 0, BW 149760 Kbit, DLY 0 usec,
     reliability 0/255, txload 1/255, rxload 1/255
  Encapsulation ATM, loopback not set
  Last input never, output never, output hang never
  Last clearing of "show interface" counters never
  Input queue: 0/75/0/0 (size/max/drops/flushes); Total output drops: 0
  Queueing strategy: fifo
  Output queue: 0/40 (size/max)
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
     0 packets input, 0 bytes, 0 no buffer
     Received 0 broadcasts (0 IP multicast)
     0 runts, 0 giants, 0 throttles
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     0 packets output, 0 bytes, 0 underruns
     0 output errors, 0 collisions, 0 interface resets
     0 output buffer failures, 0 output buffers swapped out
ATM5/0/1 is administratively down, line protocol is down
  Hardware is SPA-4XOC3-ATM, address is 0000.0000.0000 (bia 0000.0000.0000)
  MTU 4470 bytes, sub MTU 0, BW 149760 Kbit, DLY 0 usec,
     reliability 0/255, txload 1/255, rxload 1/255
  Encapsulation ATM, loopback not set
  Last input never, output never, output hang never
  Last clearing of "show interface" counters never
  Input queue: 0/75/0/0 (size/max/drops/flushes); Total output drops: 0
  Queueing strategy: fifo
  Output queue: 0/40 (size/max)
```

```
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
     0 packets input, 0 bytes, 0 no buffer
     Received 0 broadcasts (0 IP multicast)
     0 runts, 0 giants, 0 throttles
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     0 packets output, 0 bytes, 0 underruns
     0 output errors, 0 collisions, 0 interface resets
     0 output buffer failures, 0 output buffers swapped out
ATM5/0/2 is administratively down, line protocol is down
  Hardware is SPA-4XOC3-ATM, address is 0000.0000.0000 (bia 0000.0000.0000)
  MTU 4470 bytes, sub MTU 0, BW 149760 Kbit, DLY 0 usec,
     reliability 0/255, txload 1/255, rxload 1/255
  Encapsulation ATM, loopback not set
  Last input never, output never, output hang never
  Last clearing of "show interface" counters never
  Input queue: 0/75/0/0 (size/max/drops/flushes); Total output drops: 0
  Queueing strategy: fifo
  Output queue: 0/40 (size/max)
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
     0 packets input, 0 bytes, 0 no buffer
     Received 0 broadcasts (0 IP multicast)
     0 runts, 0 giants, 0 throttles
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     0 packets output, 0 bytes, 0 underruns
     0 output errors, 0 collisions, 0 interface resets
     0 output buffer failures, 0 output buffers swapped out
ATM5/0/3 is administratively down, line protocol is down
  Hardware is SPA-4XOC3-ATM, address is 0000.0000.0000 (bia 0000.0000.0000)
  MTU 4470 bytes, sub MTU 0, BW 149760 Kbit, DLY 0 usec,
     reliability 0/255, txload 1/255, rxload 1/255
  Encapsulation ATM, loopback not set
  Last input never, output never, output hang never
  Last clearing of "show interface" counters never
  Input queue: 0/75/0/0 (size/max/drops/flushes); Total output drops: 0
  Queueing strategy: fifo
  Output queue: 0/40 (size/max)
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
     0 packets input, 0 bytes, 0 no buffer
     Received 0 broadcasts (0 IP multicast)
     0 runts, 0 giants, 0 throttles
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     0 packets output, 0 bytes, 0 underruns
     0 output errors, 0 collisions, 0 interface resets
     0 output buffer failures, 0 output buffers swapped out
------------------ show controllers ------------------
Shared Port Adapter SPA-4XOC3-ATM[5/0]
 4xOC3 ATM SPA revision 1
SAR is Azanda Katana SAR/TM, rev B, manf_id 0x1B2, base 0xB8300000
 object     0x43D9DF90, port      0x43A332E8, list_elems 0x43A3C7D0
 hash_tbl   0x41EEF0A0, vc_tbl    0x4276C2F0, fid_tbl    0x441145A0
 shp_prof   0x42996990
 vc_count 0/16384 (curr/max), fid_count 12/65536 (curr/max), max_bids 1048576
 Device level stats:
  s4p3_abort                 0  s4p3_pty_errs              0
  cor_ecc_errs               0  lut_pty_errs               0
  uncor_ecc_errs             0  hdrap_pty_errs             0
  mem_bad_errs               0
  pfq2mem_rels               0  null_rel                   0
  mem2pfq_rels               0  null_dq                    0
  mem_nq                     0  pre_pfq_drops              0
  dbs_dq_cnt                 0  post_pfq_drops             0
```

```
  no_fid_drops                0  tot_free_bufs        1048575
  bid_nulls                   0  bufs_inuse                 0
  sch_cells                   0  sch_cells_out              0
  sch_blocked                 0  sch_eop                    0
  sch_empty                   0  cbwfq_merge_in             0
  cbwfq_merge_out             0
 Backpressure status:
  SEG input FIFO: not full
              LUT    RAS    PFQ    DBS
             lo hi  lo hi  lo hi  lo hi
  Port 0 RX  -  -   -  -   -  -   -  -
  Port 0 TX  -  -   -  -   -  -   -  -
  Port 1 RX  -  -   -  -   -  -   -  -
  Port 1 TX  -  -   -  -   -  -   -  -
  Port 2 RX  -  -   -  -   -  -   -  -
  Port 2 TX  1  1   -  -   -  -   -  -
  Port 3 RX  -  -   -  -   -  -   -  -
  Port 3 TX  1  1   -  -   -  -   -  -
  Port 0 Stats:
   rx_paks                    0  tx_paks                    0
   rx_cells                   0  tx_cells                   0
   rx_bytes                   0  tx_bytes                   0
   pm_rx_paks                 0  pm_tx_paks                 0
   pm_rx_bytes                0  pm_tx_bytes                0
   rx_wred_tail_dr            0  tx_wred_tail_dr            0
   rx_wred_prob_dr            0  tx_wred_prob_dr            0
   rx_buf_thr_lo          62260  tx_buf_thr_lo          186778
   rx_bufs_inuse_l            0  tx_bufs_inuse_l            0
   rx_buf_thr_hi           3276  tx_buf_thr_hi            9830
   rx_bufs_inuse_h            0  tx_bufs_inuse_h            0
   rx_crc32_errs              0  rx_crc10_errs              0
   rx_no_vcd                  0
  Port 1 Stats:
   rx_paks                    0  tx_paks                    0
   rx_cells                   0  tx_cells                   0
   rx_bytes                   0  tx_bytes                   0
   pm_rx_paks                 0  pm_tx_paks                 0
   pm_rx_bytes                0  pm_tx_bytes                0
   rx_wred_tail_dr            0  tx_wred_tail_dr            0
   rx_wred_prob_dr            0  tx_wred_prob_dr            0
   rx_buf_thr_lo          62260  tx_buf_thr_lo          186778
   rx_bufs_inuse_l            0  tx_bufs_inuse_l            0
   rx_buf_thr_hi           3276  tx_buf_thr_hi            9830
   rx_bufs_inuse_h            0  tx_bufs_inuse_h            0
   rx_crc32_errs              0  rx_crc10_errs              0
   rx_no_vcd                  0
  Port 2 Stats:
   rx_paks                    0  tx_paks                    0
   rx_cells                   0  tx_cells                   0
   rx_bytes                   0  tx_bytes                   0
   pm_rx_paks                 0  pm_tx_paks                 0
   pm_rx_bytes                0  pm_tx_bytes                0
   rx_wred_tail_dr            0  tx_wred_tail_dr            0
   rx_wred_prob_dr            0  tx_wred_prob_dr            0
   rx_buf_thr_lo          62260  tx_buf_thr_lo          186778
   rx_bufs_inuse_l            0  tx_bufs_inuse_l            0
   rx_buf_thr_hi           3276  tx_buf_thr_hi            9830
   rx_bufs_inuse_h            0  tx_bufs_inuse_h            0
   rx_crc32_errs              0  rx_crc10_errs              0
   rx_no_vcd                  0
  Port 3 Stats:
   rx_paks                    0  tx_paks                    0
   rx_cells                   0  tx_cells                   0
   rx_bytes                   0  tx_bytes                   0
```

```
  pm_rx_paks                  0  pm_tx_paks                  0
  pm_rx_bytes                 0  pm_tx_bytes                 0
  rx_wred_tail_dr             0  tx_wred_tail_dr             0
  rx_wred_prob_dr             0  tx_wred_prob_dr             0
  rx_buf_thr_lo           62260  tx_buf_thr_lo          186778
  rx_bufs_inuse_l             0  tx_bufs_inuse_l             0
  rx_buf_thr_hi            3276  tx_buf_thr_hi            9830
  rx_bufs_inuse_h             0  tx_bufs_inuse_h             0
  rx_crc32_errs               0  rx_crc10_errs               0
  rx_no_vcd                   0
 Flow utilization summary
           blks  unsh  t_rt  t_lb  t_lf  rt_lf  shap  root  drain | Total
  # free : 24568 0     1023  8184  0     8191  15355 8191   0     | 65512
flow                int     red dfl    queue size         sent          packet drops
 id   vcd  gqid use  prt dir pro clr curr  avg     max     paks    bufm  giant to/ab pl/crc
0001     0 0000 shap  1  tx   18  4      0     1   35940        0       0     0     0     0
0002     0 0000 shap  3  tx   18  4      0     1   35940        0       0     0     0     0
0003     0 0000 shap  5  tx   18  4      0     1   35940        0       0     0     0     0
0004     0 0000 shap  7  tx   18  4      0     1   35940        0       0     0     0     0
FFF8     0 0000 unsh 11  rx   18  4      0     1   35940        0       0     0     0     0
FFF9     0 0000 unsh 13  rx   18  4      0     1   35940        0       0     0     0     0
FFFA     0 0000 unsh 15  rx   18  4      0     1   35940        0       0     0     0     0
FFFB     0 0000 unsh 17  rx   18  4      0     1   35940        0       0     0     0     0
FFFC     0 0000 unsh 10  rx   21  0      0     1       0        0       0     0     0     0
FFFD     0 0000 unsh 12  rx   21  0      0     1       0        0       0     0     0     0
FFFE     0 0000 unsh 14  rx   21  0      0     1       0        0       0     0     0     0
FFFF     0 0000 unsh 16  rx   21  0      0     1       0        0       0     0     0     0
KATM FPGA: rev 0.90, base 0xB8000000, obj 0x42994748
            packets                cells                errors
port     rx         tx         rx         tx         rx         tx
 0           0          0          0          0          0          0
 1           0          0          0          0          0          0
 2           0          0          0          0          0          0
 3           0          0          0          0          0          0
PM5379 ATM Framer: Type:0, Rev:1, base 0xB8100000, obj 0x41EEA2B0
                   Cells                   CRC errs
port          rx               tx              rx
0             0                0               0
1             0                0               0
2             0                0               0
3             0                0               0
ATM5/0/0:
        ID: SFP
        Extended ID: 4
        Xcvr Type: OC3 SR-1/STM1 MM (1)
        Connector: LC
        Vendor name: OCP
        Product Identifier (PID): TRP-03BCS
        State: Enabled
ATM5/0/0:
Phased Initialization
        Phase Reached: 4
        Phase Exit Code: Success 0
        Phase Read Offset: 256
Socket Verification
        Compatibility: Compatibility passed
        Security: Security passed
------------------ show memory statistics ------------------
               Head    Total(b)     Used(b)     Free(b)   Lowest(b)  Largest(b)
Processor   4145B860   230311840   118715296   111596544   106212312    48534600
      I/O    F000000    16776736     3090304    13686432    13686432    13685880
------------------ show process memory ------------------
Total: 247088544, Used: 121805424, Free: 125283120
 PID TTY  Allocated      Freed    Holding    Getbufs    Retbufs Process
```

```
  0    0   17899632      57040   17017720          0          0 *Init*
  0    0       1256     145000       1256          0          0 *Sched*
  0    0          0          0          0          0          0 *Neutrino*
  0    0    5233000    4617848     589152     606508          0 *Dead*
  1    0          0          0       6968          0          0 Chunk Manager
  2    0        192        192       3960          0          0 Load Meter
  3    0          0          0       6960          0          0 SCP async: CWAN-
  4    0          0          0       6960          0          0 Check heaps
  5    0      25984     169280       9584      15748      51748 Pool Manager
  6    0        192        192       6960          0          0 Timers
  7    0          0          0       6976          0          0 AAA_SERVER_DEADT
  8    0        192        192       6968          0          0 AAA high-capacit
  9    0        192        192       6960          0          0 Serial Backgroun
 10    0          0          0       6960          0          0 ENVM Background
 11    0          0          0       6960          0          0 IPC Dynamic Cach
 12    0     145256        384      23968      31200          0 PROCMIB LC Proce
 13    0          0          0       6960          0          0 IPC BackPressure
 14    0       7040          0       6960          0          0 IPC Periodic Tim
 15    0          0          0       6968          0          0 IPC Deferred Por
 16    0     123536        352      25416      12756          0 IPC Seat Manager
 17    0          0          0       6960          0          0 SERIAL A'detect
 18    0     992944     993024       6960          0          0 SMART
 19    0          0          0       6960          0          0 Critical Bkgnd
 20    0      14080          0      13120          0          0 Net Background
 21    0        192        192      12960          0          0 Logger
 22    0      26384        448       9960          0          0 TTY Background
 23    0          0          0       6960          0          0 Per-Second Jobs
 24    0          0          0       6960          0          0 Per-minute Jobs
 25    0          0        152       6960          0          0 SCP Multicast
 26    0          0          0       3960          0          0 Inode Table Dest
 27    0          0          0       6976          0          0 LC to RP  defere
 28    0        192        192       6960          0          0 CWLC IFCOM Proce
 29    0          0          0       6968          0          0 IPC RTTYC Messag
 30    0        192        192      12960          0          0 INTR MGR PROCESS
 31    0          0          0       6960          0          0 ixp_exmem_reuse_
 32    0      14456      14296       7120          0          0 spnpc_dowork
 33    0          0          0       6960          0          0 Spi4 Timer
 34    0          0          0       6968          0          0 LC interrupt, J1
 35    0          0          0       6976          0          0 SIP interrupt, P
 36    0          0          0      12960          0          0 SDCC Input
 37    0        192        192      12960          0          0 SDCC Periodic
 38    0        192        192      12960          0          0 SDCC IO
 39    0          0          0       6960          0          0 CWAN LTL manager
 40    0          0          0       6960          0          0 msg_handler_proc
 41    0    2620112    2620112       6960          0          0 Cardmgr Periodic
 42    0          0          0       6960          0          0 SIP SWBus Sync P
 43    0          0          0       6960          0          0 NP doorbell proc
 44    0      10432       5344       6960       2268          0 CardMgr Events
 45    0    1905448       3592    1787560          0          0 INP Reload
 46    0          0          0       6960          0          0 ipc_handler_proc
 47    0          0          0       6960          0          0 NP doorbell proc
 48    0    2270440       2328    2158576       2268          0 ENP Reload
 49    0          0          0       6960          0          0 ipc_handler_proc
 50    0          0          0       6960          0          0 SIP2 Bus Stall
 51    0 1504729392 1504768488     200528          0          0 ifnpc_dowork
 52    0          0          0       6960          0          0 hmi_dowork
 53    0       7000       7000       6960          0          0 cwanlc_npc_dowor
 54    0          0          0       6968          0          0 VIP Encap IPC Ba
 55    0  554366168  457784816   96580296      12756          0 SPA OIR 5/0
 56    0          0          0      12960          0          0 SPA OIR 5/1
 57    0          0          0      12960          0          0 SPA OIR 5/2
 58    0          0          0      12960          0          0 SPA OIR 5/3
 59    0   27281752   27281752       6960          0          0 LC FPD Upgrade P
 60    0          0          0       6960          0          0 spa_env_monitor
```

```
  61   0        192        192       6960          0          0 AAA Dictionary R
  62   0        192        192       6960          0          0 AAA Server
  63   0          0          0       6960          0          0 AAA ACCT Proc
  64   0          0          0       6960          0          0 ACCT Periodic Pr
  65   0        192        192       6960          0          0 ATMLS task
  66   0          0          0       6968          0          0 AToM NP CLIENT B
  67   0          0          0       6968          0          0 TTFIB NP CLIENT
  68   0          0          0       6960          0          0 SSA FABLINK Proc
  69   0          0          0       6968          0          0 HYP ACCU FAB COU
  70   0     327264          0     327264          0          0 CEF process
  71   0        192        192       6960          0          0 CWTLC SSO Proces
  72   0        192        192       6960          0          0 SCP Hybrid proce
  73   0          0          0      12960          0          0 ATM NP CLIENT PR
  74   0          0          0      12968          0          0 BRIDGING NP CLIE
  75   0          0          0       6960          0          0 fr_npc_dowork
  76   0        192        192       6968          0          0 fastblk backgrou
  77   0          0          0       6960          0          0 hnpc_dowork
  78   0          0          0      12968          0          0 SIP2 BRIDGE PROC
  79   0        192        192      12960          0          0 QoS NP Client
  80   0    2355016    1220392    2338776      12756          0 CEF LC IPC Backg
  81   0  112519984  111381200      72720          0          0 CEF LC Stats
  82   0          0          0       6960          0          0 CEF MQC IPC Back
  83   0          0          0       6960          0          0 TFIB LC cleanup
  84   0        192        192       6984          0          0 Any Transport ov
  85   0        192        192       6960          0          0 LOCAL AAA
  86   0        192        192       6960          0          0 AAA Cached Serve
  87   0        192        192       6960          0          0 RADIUS TEST CMD
  88   0        192        192       6960          0          0 AAA SEND STOP EV
  89   0        168          0       7128          0          0 CEF Scanner
  90   0          0          0       6968          0          0 SIP ATM cmd hand
  91   0          0          0       6968          0          0 SONET alarm time
  92   0          0          0       6960          0          0 Net Input
  93   0        192        192       6960          0          0 Compute load avg
  94   1      90632      89968      18392          0          0 console_rpc_serv
                                 121804560 Total
------------------ show process cpu ------------------
CPU utilization for five seconds: 2%/0%; one minute: 2%; five minutes: 2%
 PID Runtime(ms)   Invoked      uSecs   5Sec   1Min   5Min TTY Process
   1           0         1          0  0.00%  0.00%  0.00%   0 Chunk Manager
   2           4     14151          0  0.00%  0.00%  0.00%   0 Load Meter
   3           0         1          0  0.00%  0.00%  0.00%   0 SCP async: CWAN-
   4        9816      7180       1367  0.16%  0.01%  0.00%   0 Check heaps
   5           0        23          0  0.00%  0.00%  0.00%   0 Pool Manager
   6           0         2          0  0.00%  0.00%  0.00%   0 Timers
   7           0         1          0  0.00%  0.00%  0.00%   0 AAA_SERVER_DEADT
   8           0         2          0  0.00%  0.00%  0.00%   0 AAA high-capacit
   9           0         2          0  0.00%  0.00%  0.00%   0 Serial Backgroun
  10         840     14179         59  0.00%  0.00%  0.00%   0 ENVM Background
  11           0      1180          0  0.00%  0.00%  0.00%   0 IPC Dynamic Cach
  12          72      1182         60  0.00%  0.00%  0.00%   0 PROCMIB LC Proce
  13           0         1          0  0.00%  0.00%  0.00%   0 IPC BackPressure
  14          36     70728          0  0.00%  0.00%  0.00%   0 IPC Periodic Tim
  15          44     70728          0  0.00%  0.00%  0.00%   0 IPC Deferred Por
  16          12        19        631  0.00%  0.00%  0.00%   0 IPC Seat Manager
  17           0         1          0  0.00%  0.00%  0.00%   0 SERIAL A'detect
  18        2956        38      77789  0.00%  0.00%  0.00%   0 SMART
  19           0         1          0  0.00%  0.00%  0.00%   0 Critical Bkgnd
  20          36     14355          2  0.00%  0.00%  0.00%   0 Net Background
  21           0        61          0  0.00%  0.00%  0.00%   0 Logger
  22         240     70728          3  0.00%  0.00%  0.00%   0 TTY Background
  23     1387988    138571      10016  2.04%  1.01%  1.04%   0 Per-Second Jobs
  24        4808      1218       3947  0.00%  0.01%  0.00%   0 Per-minute Jobs
  25           0         2          0  0.00%  0.00%  0.00%   0 SCP Multicast
  26           0         1          0  0.00%  0.00%  0.00%   0 Inode Table Dest
```

```
 27           0         3           0  0.00%  0.00%  0.00%   0 LC to RP  defere
 28           0        26           0  0.00%  0.00%  0.00%   0 CWLC IFCOM Proce
 29           0         1           0  0.00%  0.00%  0.00%   0 IPC RTTYC Messag
 30           0         2           0  0.00%  0.00%  0.00%   0 INTR MGR PROCESS
 31           0        11           0  0.00%  0.00%  0.00%   0 ixp_exmem_reuse_
 32           4        62          64  0.00%  0.00%  0.00%   0 spnpc_dowork
 33           0         1           0  0.00%  0.00%  0.00%   0 Spi4 Timer
 34           0         1           0  0.00%  0.00%  0.00%   0 LC interrupt, J1
 35           0         1           0  0.00%  0.00%  0.00%   0 SIP interrupt, P
 36           0         1           0  0.00%  0.00%  0.00%   0 SDCC Input
 37           0         2           0  0.00%  0.00%  0.00%   0 SDCC Periodic
 38           0         2           0  0.00%  0.00%  0.00%   0 SDCC IO
 39           0         1           0  0.00%  0.00%  0.00%   0 CWAN LTL manager
 40        1208     14154          85  0.00%  0.00%  0.00%   0 msg_handler_proc
 41         148     70730           2  0.00%  0.00%  0.00%   0 Cardmgr Periodic
 42           0         6           0  0.00%  0.00%  0.00%   0 SIP SWBus Sync P
 43           0         5           0  0.00%  0.00%  0.00%   0 NP doorbell proc
 44           0         5           0  0.00%  0.00%  0.00%   0 CardMgr Events
 45        1400        26       53846  0.00%  0.00%  0.00%   0 INP Reload
 46           0       379           0  0.00%  0.00%  0.00%   0 ipc_handler_proc
 47           0         5           0  0.00%  0.00%  0.00%   0 NP doorbell proc
 48        2224        25       88960  0.00%  0.00%  0.00%   0 ENP Reload
 49          16      1200          13  0.00%  0.00%  0.00%   0 ipc_handler_proc
 50           0         1           0  0.00%  0.00%  0.00%   0 SIP2 Bus Stall
 51      214912     53129        4045  0.00%  0.00%  0.00%   0 ifnpc_dowork
 52           0         4           0  0.00%  0.00%  0.00%   0 hmi_dowork
 53           0        31           0  0.00%  0.00%  0.00%   0 cwanlc_npc_dowor
 54           0         1           0  0.00%  0.00%  0.00%   0 VIP Encap IPC Ba
 55       18532    487255          38  0.00%  0.00%  0.00%   0 SPA OIR 5/0
 56          84      2372          35  0.00%  0.00%  0.00%   0 SPA OIR 5/1
 57          80      2368          33  0.00%  0.00%  0.00%   0 SPA OIR 5/2
 58          84      2368          35  0.00%  0.00%  0.00%   0 SPA OIR 5/3
 59        2432        32       76000  0.00%  0.00%  0.00%   0 LC FPD Upgrade P
 60        3112    138447          22  0.00%  0.00%  0.00%   0 spa_env_monitor
 61           0         2           0  0.00%  0.00%  0.00%   0 AAA Dictionary R
 62           0         2           0  0.00%  0.00%  0.00%   0 AAA Server
 63           0         1           0  0.00%  0.00%  0.00%   0 AAA ACCT Proc
 64           0         1           0  0.00%  0.00%  0.00%   0 ACCT Periodic Pr
 65           0         2           0  0.00%  0.00%  0.00%   0 ATMLS task
 66           0      7185           0  0.00%  0.00%  0.00%   0 AToM NP CLIENT B
 67          16      7185           2  0.00%  0.00%  0.00%   0 TTFIB NP CLIENT
 68           8    707134           0  0.00%  0.00%  0.00%   0 SSA FABLINK Proc
 69           0     14150           0  0.00%  0.00%  0.00%   0 HYP ACCU FAB COU
 70        7140    103916          68  0.00%  0.00%  0.00%   0 CEF process
 71           0         2           0  0.00%  0.00%  0.00%   0 CWTLC SSO Proces
 72         328      4423          74  0.00%  0.00%  0.00%   0 SCP Hybrid proce
 73           4     77777           0  0.00%  0.00%  0.00%   0 ATM NP CLIENT PR
 74         324     70733           4  0.00%  0.00%  0.00%   0 BRIDGING NP CLIE
 75          12      7182           1  0.00%  0.00%  0.00%   0 fr_npc_dowork
 76           4    707140           0  0.00%  0.00%  0.00%   0 fastblk backgrou
 77          40         2       20000  0.00%  0.00%  0.00%   0 hnpc_dowork
 78           0         1           0  0.00%  0.00%  0.00%   0 SIP2 BRIDGE PROC
 79         416      7079          58  0.00%  0.00%  0.00%   0 QoS NP Client
 80        3300    726380           4  0.00%  0.00%  0.00%   0 CEF LC IPC Backg
 81         628     93426           6  0.00%  0.00%  0.00%   0 CEF LC Stats
 82           0         1           0  0.00%  0.00%  0.00%   0 CEF MQC IPC Back
 83           0         1           0  0.00%  0.00%  0.00%   0 TFIB LC cleanup
 84           0         2           0  0.00%  0.00%  0.00%   0 Any Transport ov
 85           0         2           0  0.00%  0.00%  0.00%   0 LOCAL AAA
 86           0         2           0  0.00%  0.00%  0.00%   0 AAA Cached Serve
 87           0         3           0  0.00%  0.00%  0.00%   0 RADIUS TEST CMD
 88           0         2           0  0.00%  0.00%  0.00%   0 AAA SEND STOP EV
 89         128      5003          25  0.00%  0.00%  0.00%   0 CEF Scanner
 90           0         1           0  0.00%  0.00%  0.00%   0 SIP ATM cmd hand
```

```
  91           0         1           0  0.00%  0.00%  0.00%   0 SONET alarm time
  92           0         1           0  0.00%  0.00%  0.00%   0 Net Input
  93          16     14775           1  0.00%  0.00%  0.00%   0 Compute load avg
  94          92       502         183  0.00%  0.09%  0.02%   1 console_rpc_serv
------------------ show process cpu history ------------------


     2222222223333322222222222222222222111112222222222222222222
100
 90
 80
 70
 60
 50
 40
 30
 20
 10
    0....5....1....1....2....2....3....3....4....4....5....5....
              0    5    0    5    0    5    0    5    0    5
               CPU% per second (last 60 seconds)

                1           1 1  1
     2222222222332222222222242432432222222222222222222222222222
100
 90
 80
 70
 60
 50
 40
 30
 20
 10              *           * *  *
    0....5....1....1....2....2....3....3....4....4....5....5....
              0    5    0    5    0    5    0    5    0    5
               CPU% per minute (last 60 minutes)
              * = maximum CPU%   # = average CPU%

     1                   9
     4222222222222222229
100                      *
 90                      *
 80                      *
 70                      *
 60                      *
 50                      *
 40                      *
 30                      *
 20                      *
 10  *                   *
    0....5....1....1....2....2....3....3....4....4....5....5....6....6....7.
              0    5    0    5    0    5    0    5    0    5    0    5    0
                   CPU% per hour (last 72 hours)
                  * = maximum CPU%   # = average CPU%
------------------ show file systems ------------------
File Systems:
     Size(b)     Free(b)      Type  Flags  Prefixes
           -           -    opaque     rw   system:
           -           -    opaque     rw   null:
           -           -    opaque     ro   tar:
*   64097280    40606720      disk     rw   disk0:
------------------ show disk0: all ------------------
-#- --length-- -----date/time------ path
```

```
 number of file 8
 inode path is 1 idprom-oc12-atm-superspa
 fullpath is disk0:/idprom-oc12-atm-superspa
1         1152 Jun 09 2004 13:03:38 idprom-oc12-atm-superspa
 inode path is 2 idprom-4oc3-atm-superspa
 fullpath is disk0:/idprom-4oc3-atm-superspa
2         1152 Jun 09 2004 05:51:34 idprom-4oc3-atm-superspa
 inode path is 3 bonham_brd_rev2_rev19.hex
 fullpath is disk0:/bonham_brd_rev2_rev19.hex
3      2626407 Aug 24 2004 11:04:42 bonham_brd_rev2_rev19.hex
 inode path is 4 sip2-dw-mz.b2-testt
 fullpath is disk0:/sip2-dw-mz.b2-testt
4      5895640 Aug 26 2004 05:09:08 sip2-dw-mz.b2-testt
 inode path is 5 sip2-dw-mz.hp-depth
 fullpath is disk0:/sip2-dw-mz.hp-depth
5      5897476 Aug 12 2004 04:40:38 sip2-dw-mz.hp-depth
 inode path is 6 viking1.jbc
 fullpath is disk0:/viking1.jbc
6      2678150 Jun 09 2004 12:48:32 viking1.jbc
 inode path is 7 sip2-dw-mz.hpd
 fullpath is disk0:/sip2-dw-mz.hpd
7      5916716 Aug 25 2004 10:25:14 sip2-dw-mz.hpd
 inode path is 8 sip2iofpga_promlatest_rev78.hex
 fullpath is disk0:/sip2iofpga_promlatest_rev78.hex
8       468975 Aug 24 2004 10:56:54 sip2iofpga_promlatest_rev78.hex
40606720 bytes available (23490560 bytes used)
******** ATA Flash Card Geometry/Format Info ********
ATA CARD GEOMETRY
   Number of Heads:       4
   Number of Cylinders    984
   Sectors per Cylinder   32
   Sector Size            512
   Total Sectors          125952
ATA CARD FORMAT
   Number of FAT Sectors  246
   Sectors Per Cluster    2
   Number of Clusters     62595
   Number of Data Sectors 125817
   Base Root Sector       595
   Base FAT Sector        103
   Base Data Sector       627
------------------ show scp status ------------------
Rx 29169,  Tx 29165,  Sap 3  scp_my_addr 0x4
Id Sap      Channel name    current/peak/retry/dropped/total  time(queue/process/ack)
-- ---- ------------------ --------------------------------  ----------------------
0  0    SCP Unsolicited:0       0/    2/    0/      0/ 4421      0/   0/  76
1  23   SCP async: CWAN-NMP     0/    0/    0/      0/    0      0/   0/   0
------------------ show inventory ------------------
------------------ show region ------------------
Region Manager:
      Start         End     Size(b)  Class  Media  Name
 0x0F000000  0x0FFFFDFF    16776704  Iomem  R/W    iomem
 0x40000000  0x4EFFFFFF   251658240  Local  R/W    main
 0x40010FC0  0x4067FFE7     6746152  IText  R/O    main:text
 0x40680000  0x40CE977F     6723456  IData  R/W    main:data
 0x40CE9780  0x4145B85F     7807200  IBss   R/W    main:bss
 0x4145B860  0x4EFFFFFF   230311840  Local  R/W    main:heap
 0x80000000  0x8EFFFFFF   251658240  Local  R/W    main:(main_k0)
 0xA0000000  0xAEFFFFFF   251658240  Local  R/W    main:(main_k1)
------------------ show buffers ------------------
Buffer elements:
     500 in free list (500 max allowed)
     595460 hits, 0 misses, 0 created
Public buffer pools:
```

```
Small buffers, 104 bytes (total 37, permanent 25, peak 39 @ 19:39:17):
     35 in free list (20 min, 60 max allowed)
     310581 hits, 48 misses, 110 trims, 122 created
     0 failures (0 no memory)
Middle buffers, 600 bytes (total 15, permanent 15, peak 21 @ 19:39:19):
     14 in free list (10 min, 30 max allowed)
     20386 hits, 2 misses, 6 trims, 6 created
     0 failures (0 no memory)
Big buffers, 1536 bytes (total 6, permanent 5, peak 8 @ 19:39:21):
     6 in free list (5 min, 10 max allowed)
     16375 hits, 1 misses, 11 trims, 12 created
     0 failures (0 no memory)
VeryBig buffers, 4520 bytes (total 50, permanent 50):
     50 in free list (40 min, 300 max allowed)
     0 hits, 0 misses, 0 trims, 0 created
     0 failures (0 no memory)
Large buffers, 5024 bytes (total 0, permanent 0):
     0 in free list (0 min, 5 max allowed)
     0 hits, 0 misses, 0 trims, 0 created
     0 failures (0 no memory)
Huge buffers, 18024 bytes (total 1, permanent 1):
     1 in free list (0 min, 2 max allowed)
     0 hits, 0 misses, 0 trims, 0 created
     0 failures (0 no memory)
Interface buffer pools:
IPC buffers, 4096 bytes (total 85, permanent 16, peak 85 @ 00:00:36):
     12 in free list (10 min, 30 max allowed)
     251678 hits, 23 fallbacks, 0 trims, 69 created
     0 failures (0 no memory)
Header pools:
SDCC Packet Header buffers, 0 bytes (total 2048, permanent 2048):
     0 in free list (2048 min, 2048 max allowed)
     2048 hits, 0 misses
     2048 max cache size, 2048 in cache
     0 hits in cache, 0 misses in cache
Particle Clones:
     2048 clones, 0 hits, 0 misses
Public particle pools:
GLOBAL buffers, 512 bytes (total 862, permanent 862):
     0 in free list (0 min, 862 max allowed)
     862 hits, 0 misses
     862 max cache size, 862 in cache
     0 hits in cache, 0 misses in cache
COMM buffers, 512 bytes (total 32, permanent 32):
     0 in free list (0 min, 32 max allowed)
     32 hits, 0 misses
     32 max cache size, 32 in cache
     0 hits in cache, 0 misses in cache
Private particle pools:
SB-FIFO5/0/1 buffers, 512 bytes (total 1000, permanent 1000):
     0 in free list (0 min, 1000 max allowed)
     1000 hits, 0 fallbacks
     1000 max cache size, 744 in cache
     261 hits in cache, 0 misses in cache
     14 buffer threshold, 0 threshold transitions
EOBC0/0 buffers, 512 bytes (total 2000, permanent 2000):
     0 in free list (0 min, 2000 max allowed)
     2000 hits, 0 misses
     2000 max cache size, 1744 in cache
     79803 hits in cache, 0 misses in cache
     14 buffer threshold, 0 threshold transitions
Ingress ESF Engine buffers, 1028 bytes (total 21, permanent 21):
     0 in free list (21 min, 21 max allowed)
     21 hits, 0 misses
```

```
     21 max cache size, 0 in cache
     21 hits in cache, 0 misses in cache
Egress ESF Engine buffers, 1028 bytes (total 21, permanent 21):
     0 in free list (21 min, 21 max allowed)
     21 hits, 0 misses
     21 max cache size, 0 in cache
     21 hits in cache, 0 misses in cache
------------------ show platform hardware version ------------------
        Product Number: '7600-MSC-400'
        Baseboard Serial Number: 'SAD073101T6'
        Manufacturing Assembly Revision: 'A01'
        Baseboard Revision: 0.14
        Daughtercard Serial Number: ''
        CPU Manufacturer: 0x4 (Broadcom)
        CPU SOC Type: BCM1125H 400 Mhz rev 0x21 wafer 0x1
        CPU Revision: 0.3
        Super Santa Ana: 0x0
        PM PLD: 0x5
        IOFPGA version: 0x00051
               type:    0x0 format 0x2 loaded from Upgrade (C1) region
        ROMMON (major.minor.dev.build) = 1.1.0.1
        Bonham version: 0x019
               type:    rev2-or-higher-bb
        Gldfgr version: 0x10014
        Oddjob version: 0x10010
        Hyperion: 0x2
        Config PLD: 0x6
        Ingress ESF Engine          : Type 0.0 rev 0.2, 1400 MHz
                                      SRAM clocks: 140/200/200/200 MHz
                                      DRAM clock: 400 MHz
        Egress ESF Engine           : Type 0.0 rev 0.2, 1400 MHz
                                      SRAM clocks: 200/200/140/200 MHz
                                      DRAM clock: 400 MHz
------------------ show platform hardware iofpga ------------------
CPU base address:       0xB1000000
0000: type_and_version: 0x00000251
0004: global_intr_en:   0x100D1021
0008: global_intr_stat: 0x00000008
000C: reset_reason_reg: 0x00000001
0010: cpu_resets:       0x00000000
0014: device_reset:     0x00000040
0018: watchdog:         0x00003D96
001C: who_am_i:         0x00002200
0020: rommon_sel:       0x00000001
0024: led_reg:          0x0000001F
0028: iofpga_ctrl:      0x00000400
002C: earl_control:     0x0000000F
0030: iobus_intr_en:    0x0000000F
0034: iobus_intr_stat:  0x00000000
0038: iobus_deadman:    0x00000015
003C: iobus_last_addr:  0x00000000
0040: iobus_last_data:  0x00000000
0044: iobus_tran_stat:  0x00000000
0048: test_pins_reg:    0x00000000
0058: pld_jtag:         0xCAFEBABE
SIP2 base addr:   0xB1000400
0000: spa_ctrl:         0x00000923
0004: spa_intr_en:      0x7E07222F
0008: spa_intr_stat:    0x01000000
000C: spa_stat:         0x0000222C
0010: spabus_deadman:   0x0000002A
0014: spabus_tran_stat: 0x0800021C
0018: spabus_last_read: 0x00070001
001C: spabus_last_par:  0x00003531
```

```
0020: spa_test:         0xAB2B2B29
0024: spd_ctrl:         0x00000007
0028: scratchpad:       0x00000000
002C: ha_state:         0x00000001
0030: spa0_debounce:    0x0000000A
0034: spa1_debounce:    0x0000000A
0038: spa2_debounce:    0x0000000A
003C: spa3_debounce:    0x0000000A
0044: ha_sanity:        0x00000007
0040: spa_sonet_clk:    0x200AD500
0048: spa_sonet_clk_ie: 0x00000000
004C: spa_sonet_clk_is: 0x1FFFFFFC
0050: spa_sonet_clk_div[0]: 0x0000097E
0054: spa_sonet_clk_div[1]: 0x0000097E
0058: spa_sonet_clk_div[2]: 0x0000097E
005C: spa_sonet_clk_div[3]: 0x0000097E
```

show hw-module subslot

To display diagnostic information about internal hardware devices for a SPA, use the **show hw-module subslot** command in privileged EXEC configuration mode.

To display diagnostic information about modules and interfaces on a Cisco 4400 Series ISR, use the **show hw-module subslot** command in privileged EXEC mode.

show hw-module subslot [*slot*/*subslot*] {**brief** | **config** | **counters** | **errors** | **registers** | **status**} **device** *port*

Cisco 4400 Series Integrated Services Router (ISR)

show hw-module subslot [*slot*/*subslot*]
all | **attribute** | **entity** | **fpd** | **oir** | **sensors** | **subblock**

Syntax Description

slot	(Optional) Chassis slot number or module interface slot number. Refer to the appropriate hardware manual for slot information. For SIPs, refer to the platform-specific SPA hardware installation guide or the corresponding "Identifying Slots and Subslots for SIPs and SPAs" topic in the platform-specific SPA software configuration guide. For more information on slots for the Cisco 4400 Series ISR, refer to hardware installation guide.
/*subslot*	(Optional) Secondary slot number on a SIP where a SPA is installed. Refer to the platform-specific SPA hardware installation guide and the corresponding "Specifying the Interface Address on a SPA" topic in the platform-specific SPA software configuration guide for subslot information. For more information on subslots for the Cisco 4400 Series ISR, refer to hardware installation guide.
all*subslot*	Selects all supported modules and displays diagnostic and register information related to the modules including: • **attribute**--Detailed module attribute information • **entity**--MIB details of an entity[1]. • **fpd**--Field programmable devices (fpd) information • **oir**--Online insertion and removal (oir) summary • **sensors**--Environmental sensor summary • **subblock**--Internal data structure related to the supported module[1] • **tech-support**--Subslot information for technical support

brief config | **counters errors** | **registers status**	Specifies the display of diagnostic and register information related to the following areas: • **brief**--Reserved for future. • **config**--Displays information related to configuration of the specified internal hardware device. • **counters**--Displays statistics related to the processing by the specified internal hardware device. • **errors**--Reserved for future. • **registers**--Displays register information for the specified internal hardware device. • **status**--Displays status information for the specified internal hardware device.
device	Specifies the internal hardware device or path on the SPA for which you want to display diagnostic information, including the field programmable gate array (FPGA) device, MAC device, PHY device, or System Packet Interface Level 4 (SPI4) path from the MSC to the FPGA device.
port	(Optional) Port or interface number. Refer to the appropriate hardware manual for port information. For SPAs, refer to the corresponding "Specifying the Interface Address on a SPA" topics in the platform-specific SPA software configuration guide.

Command Default

No default behavior or values

Command Modes

Privileged EXEC

Command History

Release	Modification
12.2(20)S2	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
Cisco IOS XE Release 3.9S	This command was implemented on Cisco 4400 Series ISR and integrated into Cisco IOS XE Release 3.9 S.

Usage Guidelines

Use the **show hw-module subslot** command to obtain diagnostic information about an interface on the SPA.

The **counters** keyword displays a subset of the statistics that are also provided by the **show controllers fastethernet** command for the specified SPA device.

Use the **show hw-module subslot** command in Cisco 4400 Series ISRs to obtain diagnostic information related to all supported Cisco services modules and network interface modules(NIM). You can use the **show hw-module subslot all oir** command to verify the operation and proper activation of a module after an online insertion or removal.

Show hw-module subslot all oir Example

The following sample output from the **show hw-module subslot all oir** command verifies activation and proper operation of all supported modules on the router:

```
Router#show hw-module subslot all oir

 Module         Model              Operational Status

-------------- ------------------ -------------------------

subslot 0/1    NIM-8MFT-T1/E1       ok
subslot 1/0    SM-X T1/E1           ok
```

Examples

The following examples provide sample output for several versions of the **show hw-module subslot** command for a SPA located in the top subslot (0) of the MSC that is installed in slot 4 on a Cisco 7304 router.

show hw-module subslot config fpga Example

The following shows sample output from the **show hw-module subslot config** command for the FPGA device on the first interface (port 0):

```
Router# show hw-module subslot 4/0 config fpga 0
FPGA RX Config
  RX FIFO parity select is even
  RX CRC check is  enabled
  RX SHIM header insertion is  disabled
  RX Flow control is enabled
  RX CRC strip is  enabled
  RX TCAM LKUP is enabled
FPGA TX Config
  TX FIFO parity select is even
  TX CRC generation is enabled
  TX Padding is enabled
```

show hw-module subslot config phy Example

The following shows sample output from the **show hw-module subslot config** command for the PHY device on the first interface (port 0):

```
Router# show hw-module subslot 4/0 config phy 0
  PHY version: identifier1 = 0x141, identifier2 = 0xCD2
  PHY Configuration:
  control (reg 0) = 0x3100
    PHY state: not in reset, not powered down, not isoloated
    speed: 100 Mbps, duplex: full
    auto-negotiation enabled, loopback disabled, collision test disabled
  phy specific control (reg 16) = 0x78
    force link good: no
    MDI cross-over mode: automatic crossover
    Tx FIFO depth: +/- 16 bits, Rx FIFO depth: +/- 16 bits
    never assert CRS on transmit, energy detect: off
```

```
    enable extended distance: no, 125 clock: low
    MAC interface power: always up, SQE test: disabled
    polarity reversal: enabled, jabber function: enabled
  extended phy specific control (reg 20) = 0xCE2
    line loopback: disabled, detect lost lock: no, enabled RCLK
    master downshift counter: 4, slave downshift counter: 0
    default MAC interface speed: 1000 Mbps
    fiber auto-negotiation disabled
    add delay to RX_CLK for RXD outputs: yes
    add delay to GTX_CLK for TXD latching: yes
  auto-negotiation advertisement for 10/100 (reg 4) = 0xDE1
    10Base-Tx half-duplex: yes, full-duplex: yes
    100Base-Tx half-duplex: yes, full-duplex: yes
    pause frame support: yes, asymmetric pause: yes
    set remote fault bit: no, advertise next page: no
```

show hw-module subslot counters fpga Example

The following shows sample output from the **show hw-module subslot counters** command for the FPGA device on the first interface (port 0):

Note This information is also available using the **show controllers fastethernet** command.

```
Router# show hw-module subslot 4/0 counters fpga 0
Input: Total (good & bad) packets: 5734
         TCAM drops: 4908
         Satisfy (host-backpressure) drops: 0
         CRC drops: 0
         PL3 RERRs: 0
  Output: EOP (SPI4) errors: 0
```

show hw-module subslot status mac Example

The following shows sample output from the **show hw-module subslot** command for MAC device status on the first interface (port 0):

```
Router# show hw-module subslot 4/0 status mac 0
  Status registers:
    speed = 100 Mbps, duplex = full, interface mode = copper
    spi3 side loopback is disabled, line side loopback is disabled
    padding is disabled, crc add is disabled
    force duplex is enabled
  Rx FIFO status:
    Read pointer = 0xCDE, Write pointer = 0xCDE
    Occupancy of FIFO in 8 byte locations = 0
    Reset is not set
    Overflow event did not occur
  Tx FIFO status:
    Read pointer = 0x498, Write pointer = 0x498
    Occupancy of FIFO in 8 byte locations = 0
    Overflow event did not occur
    Underflow event did not occur
    Out of sequence event did not occur
```

show hw-module subslot status phy Example

The following shows sample output from the **show hw-module subslot** command for PHY device status on the first interface (port 0):

```
Router# show hw-module subslot 4/0 status phy 0
  PHY Status:
  status (reg 1) = 0x7949
    link is down, auto-negotiation is not complete
    remote fault not detected, jabber not detected
  phy specific status (reg 17) = 0x4100
    link is down (real-time), speed/duplex not resolved
    speed: 100 Mbps, duplex: half
    page not received, cable length is 80 - 110m
    MDI cross-over status: MDI, downshift status: no
    energy detect status: active
    transmit pause: disabled, receive pause: disabled
    polarity: normal, jabber: no
  phy specific extended status (reg 27) = 0x848B
    Fiber/ copper auto selection disabled, copper link
    Serial interface auto-negotiation bypass disabled
    Serial interface auto-negotiation bypass status:
      Link came up because regular fiber autoneg completed
    Interrupt polarity is active low
  receive error count: 0x0
```

Related Commands

Command	Description
hw-module subslot service-engine session	Opens a session on the Cisco WebEx Node SPA console.
service-engine default-gateway	Defines a default gateway router IP address for the Cisco WebEx Node SPA.
service-engine ip address	Selects and configures the internal interface for management traffic on a Cisco WebEx Node SPA.
service-engine hostname	Specifies or modifies the hostname or domain name associated with a Cisco WebEx Node SPA.
service-engine nameserver	Specifies the primary and secondary domain name server used by the Cisco WebEx Node SPA.
service-engine wma-passcode	Configures the name and that are used for authentication on a Cisco WebEx Node SPA.
service-engine wma-token	Configures an encrypted token on a Cisco WebEx Node SPA.
service-engine wma-url	Specifies the URL to which the Cisco WebEx Node SPA must connect to enable WebEx meetings.

show hw-module subslot fpd

To display the current versions of all field-programmable devices (FPDs) for a particular SPA or all of the active SPAs on a router, use the **showhw-modulesubslotfpd** command in privileged EXEC mode.

Cisco 7304 Router
show hw-module subslot [*slot*/*subslot*] **fpd**

Cisco 7600 Series Routers, Catalyst 6500 Series Switches, Cisco 12000 Series Routers, and Cisco uBR10012 Universal Broadband Router
show hw-module subslot {*slot*/*subslot* | **all**} **fpd**

Syntax Description

slot	Chassis slot number. Refer to the platform-specific SPA hardware installation guide and the corresponding "Identifying Slots and Subslots for SIPs and SPAs" topic in the platform-specific SPA software configuration guide.
subslot	Secondary slot number on a SPA interface processor (SIP) where a SPA is installed. Refer to the platform-specific SPA hardware installation guide and the corresponding "Specifying the Interface Address on a SPA" topic in the platform-specific SPA software configuration guide for subslot information.
all	Specifies display of FPD information for all SPAs in the system. **Note** The **all** keyword is not supported for SPAs on the Cisco 7304 router.

Command Default

For the Cisco 7304 router, if no location is specified, the output for this command will show information for all supported card types on the router.

For the Cisco 7600 series routers, Catalyst 6500 series switches, and Cisco 12000 series routers, there is no default behavior or values.

For more information about FPD upgrades on shared port adapters (SPAs), refer to the Cisco 7600 Series Router SIP, SSC, and SPA Software Configuration Guide.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.2(20)S2	This command was introduced.
12.2(18)SXE	The **all** keyword was added in Cisco IOS Release 12.2(18)SXE on the Cisco 7600 series routers and Catalyst 6500 series switches.
12.0(31)S	This command was integrated into Cisco IOS Release 12.0(31)S and introduced on Cisco 12000 series routers.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

Release	Modification
12.2(33)SCB	This command was integrated into Cisco IOS Release 12.2(33)SCB.

Usage Guidelines

Other than the FPD version information, the output for this command may also contain useful FPD-related notes.

Cisco 7304 Router

The **all** keyword is not supported on the Cisco 7304 router. The *slot/subslot* arguments are optional, and if you do not specify them, the command displays FPD information for all supported card types on the router.

Cisco 7600 Series Routers, Catalyst 6500 Series Switches, 12000 Series Routers, and Cisco uBR10012 Universal Broadband Router

If you do not use the **all** keyword, then you must specify the *slot/subslot* arguments to select the location of a particular card. There is no default behavior for this command on the Cisco 7600 series routers.

Examples

Displaying FPD Information for a Particular SPA Example

This example shows the output when using the *slot/subslot* arguments to identify a particular SPA. This SPA meets the minimum FPD requirements with that particular Cisco IOS release.

```
Router#
show hw-module subslot 4/0 fpd
==== ====================== ====== ==========================================
                             H/W   Field Programmable   Current   Min. Required
Slot Card Description        Ver.  Device: "ID-Name"    Version      Version
==== ====================== ====== ================== =========== ==============
4/0 SPA-4XOC3-ATM           1.0   1-I/O FPGA             0.121       0.121
==== ====================== ====== ==========================================
```

Cisco uBR10012 Universal Broadband Router

The following example shows the output when using the *slot/subslot* arguments to identify a particular SPA on a Cisco uBR10012 router:

```
Router#
show hw-module subslot 3/1 fpd
==== ====================== ====== ==========================================
                             H/W   Field Programmable   Current   Min. Required
Slot Card Type               Ver.  Device: "ID-Name"    Version      Version
==== ====================== ====== ================== =========== ==============
3/1 SPA-24XDS-SFP           1.0   1-Modena BLAZE FPG  1285.1444   1285.1444
==== ====================== ====== ==========================================
```

Displaying FPD Information for all SPAs in the System Example

This example shows FPD image file versions for all SPAs in the system:

```
Router# show hw-module subslot all fpd
==== ====================== ====== ==========================================
```

```
                            H/W   Field Programmable   Current   Min. Required
Slot Card Type              Ver.  Device: "ID-Name"    Version      Version
==== ====================== ====== ================== =========== ==============
 4/0 SPA-4XOC3-ATM          1.0   1-I/O FPGA             0.121       0.121
---- ---------------------- ------ ------------------ ----------- --------------
 4/1 SPA-8XT1/E1            0.143 1-ROMMON               2.12        2.12
                                  2-I/O FPGA             0.22        0.22
---- ---------------------- ------ ------------------ ----------- --------------
 4/3 SPA-4XOC3-POS          0.100 1-I/O FPGA             3.4         3.4
---- ---------------------- ------ ------------------ ----------- --------------
 7/0 SPA-8XCHT1/E1          0.117 1-ROMMON               2.12        2.12
                                  2-I/O FPGA             0.22        0.22
---- ---------------------- ------ ------------------ ----------- --------------
 7/1 SPA-4XOC3-ATM          0.205 1-I/O FPGA             0.121       0.121
==== ====================== ====== ================================================
```

Cisco uBR10012 Universal Broadband Router

The following example shows FPD image file versions for all SPAs on a Cisco uBR10012 router:

```
Router#
show hw-module subslot all fpd
==== ====================== ====== ================================================
                            H/W   Field Programmable   Current   Min. Required
Slot Card Type              Ver.  Device: "ID-Name"    Version      Version
==== ====================== ====== ================== =========== ==============
 3/0 SPA-24XDS-SFP          1.0   1-Modena BLAZE FPG  1285.1444   1285.1444
---- ---------------------- ------ ------------------ ----------- --------------
 3/1 SPA-24XDS-SFP          1.0   1-Modena BLAZE FPG  1285.1444   1285.1444
---- ---------------------- ------ ------------------ ----------- --------------
 3/2 SPA-1X10GE-L-V2        1.2   1-10GE V2 I/O FPGA     1.9         1.9
---- ---------------------- ------ ------------------ ----------- --------------
 3/3 SPA-5X1GE-V2           1.2   1-5xGE V2 I/O FPGA     1.10        1.10
==== ====================== ====== ================================================
```

Displaying Information for all SPAs in the System Example (Cisco 7304 only)

The **all** keyword is not supported on the Cisco 7304 router.

To display all FPD image file versions for all SPAs on a Cisco 7304 router, enter the **showhw-modulesubslotfpd** command without specifying a slot and subslot. The following example shows all FPD image file versions on a Cisco 7304 router:

```
Router# show hw-module subslot fpd
==== ====================== ====== ================================================
                            H/W   Field Programmable   Current   Min. Required
Slot Card Description       Ver.  Device:"ID-Name"     Version      Version
==== ====================== ====== ================== =========== ==============
 2/0 SPA-4FE-7304           0.32
1-Data & I/O FPG
A      4.13        4.13
---- ---------------------- ------ ------------------ ----------- --------------
 2/1 SPA-2GE-7304           0.15
1-Data & I/O FPG
A      4.13        4.13

===== ====================== =======
================================================
```

Related Commands

Command	Description
show hw-module all fpd	Displays the current versions of all FPDs for all of the supported card types on a router.
show hw-module slot fpd	Displays the current versions of all FPDs for a SIP in the specified slot location on a router, and for all of the SPAs installed in that SIP.

show hw-module subslot oir

To display the operational status of a shared port adapter (SPA), use the **showhw-modulesubslotoir** command in privileged EXEC configuration mode.

show hw-module subslot {*slot*/*subslot* | **all**} **oir** [**internal**]

Syntax Description

slot	Chassis slot number. Refer to the appropriate hardware manual for slot information. For SIPs, refer to the platform-specific SPA hardware installation guide or the corresponding "Identifying Slots and Subslots for SIPs and SPAs" topic in the platform-specific SPA software configuration guide.
/ *subslot*	Secondary slot number on a SPA interface processor (SIP) where a SPA is installed. Refer to the platform-specific SPA hardware installation guide and the corresponding "Specifying the Interface Address on a SPA" topic in the platform-specific SPA software configuration guide for subslot information.
all	Displays OIR status for all supported card types in the system.
internal	(Optional) Displays detailed diagnostic information. This option is intended for internal diagnostic use with Cisco Systems technical support personnel.

Command Default

No default behavior or values

Command Modes

Privileged EXEC

Command History

Release	Modification
12.2(25)S3	This command was introduced.
12.2(18)SXE	Thiscommand was integrated into Cisco IOS Release 12.2(18)SXE.
12.0(31)S	This command was integrated into Cisco IOS Release 12.0(31)S.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

Usage Guidelines

Use the **showhw-modulesubslotoir** command to obtain operational status information about one or all SPAs. To display information for a specific SPA, specify the slot number of the SIP and the subslot number of the SPA about which you want information.

To display information for all SPAs in the router, do not specify the *slot*/*subslot* arguments and use the **all** keyword. If no location is specified, the output for this command will show information for all SPAs in the router.

The optional **internal** keyword displays detailed diagnostic information that is recommended only for use with Cisco Systems technical support personnel.

Examples

The following example shows the operational status of all of the SPAs installed in a router where two of the SPAs are in an out-of-service condition:

```
Router# show hw-module subslot all oir
Module         Model              Operational Status
-------------- ------------------ ------------------------
subslot 4/0    SPA-4XOC3-POS      booting
subslot 4/1    SPA-4XOC3-ATM      out of service(FPD upgrade failed)
subslot 4/2    SPA-4XOC3-POS      ok
subslot 4/3    SPA-1XTENGE-XFP    out of service(SPA unrecognized)
```

The table below describes the possible values for the Operational Status field in the output.

Note The following status descriptions are not applicable to every SPA and can be platform-specific.

Table 1: Operational Status Field Descriptions

Operational Status	Description
admin down	SPA is administratively disabled by the **hw-modulesubslotshutdown** global configuration command.
booting	SPA is initializing.
missing	SPA is not present in the SIP subslot.
ok	SPA is operational.
out of service (*reason*)	The SPA is out of service for one of the following reasons: **Note** The following reasons are not applicable to every SPA and can be platform-specific. • Analyze failed--Failed to create a SPA data structure, most likely due to a memory allocation problem. • Authentication failed--A SPA has failed hardware validation. • Data structure create error--Failed to create a SPA data structure, most likely due to a memory allocation problem. • Event corrupt--A SPA online insertion and removal (OIR) event has been corrupted. This could be caused by a corrupted message between the SIP and the Route Processor (RP) or some other software or hardware problem. • Event sequence error--A SPA OIR event was received out of sequence. This could be caused by a corrupted message between the SIP and the Route Processor (RP) or some other software or hardware problem. • Fail code not set--Failure code could not be read from a SPA OIR event message. This could be caused by a corrupted message between the SIP and the RP or some other software or hardware problem. • Failed too many times--A SPA is disabled because it has failed more than the allowable limit on the platform.

Operational Status	Description
	• FPD upgrade failed--A field-programmable device, such as the Field-Programmable Gate Array (FPGA), failed to automatically upgrade. • H/W signal deasserted--The SPA_OK or PWR_OK hardware signal indicating that the SPA is accessible is no longer asserted. • Heartbeat failed--Occurs when intelligent SPAs encounter heartbeat failures. • Incompatible FPD--An FPGA version mismatch with the Cisco IOS software has been detected for the SPA. • Init timeout--Time limit has been reached during initialization of a SPA. • Read SPA type failed--A read from the hardware for the SPA type failed. • Reload request--A SPA reload is in progress from the **hw-modulesubslotreload** command. • SPA h/w error--The SPA software driver has detected a hardware error. • SPA ready timeout--A timeout ocurred on the RP while waiting for the SPA to become operational. • SPA type mismatch--Occurs when you have preconfigured a SPA of one type, but have inserted a SPA of a different type. **Note** This reason code only applies to those platforms that support pre-configuration. This is not applicable to a Cisco 7600 series router or Catalyst 6500 series switch. • SPA unrecognized--SPA is not supported by the Cisco IOS software release. • Start failed--Failed to start interfaces on SPA. • Unexpected inserted event--The SPA OIR software has received a SPA insertion event when the OIR software considered the SPA already present. • Wait h/w ok timeout--A timeout occurred while waiting for the SPA_OK and PWR_OK hardware signals to be asserted. • Wait start timeout--A timeout occurred on the SIP while waiting for permission from the RP to bring up the SPA.
stopped	SPA has been gracefully deactivated using the **hw-modulesubslotstop** privileged EXEC command on the Cisco 7304 router.

The following example shows the operational status of all of the SPAs installed in a router where all SPAs are running successfully:

```
Router# show hw-module subslot all oir

Module        Model                Operational Status
------------- -------------------- ------------------------
```

```
subslot 1/1   SPA-2XOC3-ATM        ok
subslot 4/0   SPA-2XT3/E3          ok
subslot 4/1   SPA-4XOC3-POS        ok
subslot 4/2   SPA-8XCHT1/E1        ok
```

The following example shows sample output when using the optional **internal** keyword:

```
Router# show hw-module subslot 4/0 oir internal
WARNING: This command is not intended for production use
and should only be used under the supervision of
Cisco Systems technical support personnel.
sm(spa_oir_tsm subslot 4/0 TSM), running yes, state ready
Admin Status: admin enabled,  Operational Status: ok(1)
Last reset Reason: manual
TSM Context:
    configured_spa_type 0x483
    soft remove fail code 0x0(none)
    last_fail_code 0x110E(SPA unrecognized)
    fail_count 0
    timed_fail_count 0, failed_spa_type 0x483
    recovery_action 6
    associated_fail_code 0x110E(SPA unrecognized)
    sequence numbers: next from tsm 4, last to tsm 2
    flags 0x0
Subslot:
    spa type 0x483, active spa type 0x483
    subslot flags 0x0, plugin flags 0x0
TSM Parameters:
    wait_psm_ready_timeout 360000 ms, init_timeout 240000 ms
    short_recovery_delay 5000 ms, long_recovery_delay 120000 ms
    ok_up_time 1200000 ms, bad_fail_count 10
    fail_time_period 600000 ms, max_fail_count 5
    does not support pre-configuration
SPA OIR state machine audit statistics
               In-sync poll-count  qry-fail resp-fail  restarts fail-count
subslot 4/0         yes          1         0         0         0          0
```

Related Commands

Command	Description
hw-module subslot reload	Restarts a SPA and its interfaces.
hw-module subslot shutdown	Shuts down a SPA with or without power.

show hw-module subslot service-engine status

To display the Cisco WebEx Node SPA application status on a Cisco ASR 1000 Series Router, use the **showhw-modulesubslotservice-enginestatus**command in privileged EXEC mode.

show hw-module subslot *slot/subslot* **service-engine status**

Syntax Description

slot	Specifies the chassis slot number for the Cisco ASR 1000 Series Router SIP.
/ *subslot*	Specifies the secondary subslot number on a Cisco ASR 1000 Series Router SIP where a SPA is installed.

Command Default

No default behavior or values.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
IOS XE Release 2.4	Thiscommand was introduced.

Usage Guidelines

Use the **showhw-modulesubslotservice-enginestatus**command to obtain information about the Cisco WebEx Node SPA application status. This includes configuration information sent from the Route Processor (RP) and the operation status of the application.

Examples

The following example provides sample output for the **showhw-modulesubslotservice-enginestatus**command for a Cisco WebEX Node SPA located in the top subslot (0) of the SIP that is installed in slot 0 on a Cisco ASR 1000 Series Router:

Related Commands

Command	Description
hw-module subslot service-engine session	Opens a session on the Cisco WebEx Node SPA console.
service-engine default-gateway	Defines a default gateway router IP address for the Cisco WebEx Node SPA.
service-engine ip address	Selects and configures the internal interface for management traffic on a Cisco WebEx Node SPA.
service-engine hostname	Specifies or modifies the hostname or domain name associated with a Cisco WebEx Node SPA.
service-engine nameserver	Specifies the primary and secondary domain name server used by the Cisco WebEx Node SPA.
service-engine wma-passcode	Configures the name and that are used for authentication on a Cisco WebEx Node SPA.

Command	Description
service-engine wma-token	Configures an encrypted token on a Cisco WebEx Node SPA.
service-engine wma-url	Specifies the URL to which the Cisco WebEx Node SPA must connect to enable WebEx meetings.

show hw-module subslot transceiver

To display the information about an optical transceiver installed in a shared port adapter (SPA), use the **showhw-modulesubslottransceiver** command in privileged EXEC configuration mode.

show hw-module subslot *slot*/*subslot* **transceiver port** {**idprom** [**brief** | **detail** | **dump**] | **status**}

Syntax Description

slot	Chassis slot number. Refer to the appropriate hardware manual for slot information. For SIPs, refer to the platform-specific SPA hardware installation guide or the corresponding "Identifying Slots and Subslots for SIPs and SPAs" topic in the platform-specific SPA software configuration guide.
/ *subslot*	Secondary slot number on a SPA interface processor (SIP) where a SPA is installed. Refer to the platform-specific SPA hardware installation guide and the corresponding "Specifying the Interface Address on a SPA" topic in the platform-specific SPA software configuration guide for subslot information.
port	Port or interface number. Refer to the platform-specific SPA hardware installation guide and the corresponding "Specifying the Interface Address on a SPA" topic in the platform-specific SPA software configuration guide for subslot information.
idprom	Displays detailed hardware information for the specified transceiver.
brief	(Optional) Displays summary hardware information for the specified transceiver.
detail	(Optional) Displays detailed hardware information for the specified transceiver.
dump	(Optional) Displays register information for the specified transceiver.
status	Displays operational status for the specified transceiver.

Command Default

No default behavior or values

Command Modes

Privileged EXEC

Command History

Release	Modification
12.2(18)SXE	Thiscommand was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

Usage Guidelines

Use the **showhw-modulesubslottransceiver** command to obtain hardware information or operational status for optical devices installed in a SPA.

Cisco Systems qualifies the small form-factor pluggable (SFP) optics modules that can be used with SPAs.

Note The SPAs will only accept the SFP modules listed as supported in this document. An SFP check is run every time an SFP module is inserted into a SPA and only SFP modules that pass this check will be usable.

If a transceiver has not been qualified by Cisco Systems for use with a SPA, the **showhw-modulesubslottransceiverstatus** command reports the following message:

```
The transceiver in slot 4 subslot 0 port 2
  is not a Cisco supplied component. In the current configuration
  third party transceivers are not serviced.
```

If a transceiver has not been qualified by Cisco Systems for use with a SPA, the**showhw-modulesubslottransceiveridprom** command reports the following message:

```
Transceiver is not a Cisco supplied part: the system cannot read the IDPROM
```

Examples

Example of the show hw-module subslot transceiver idprom Command for an OC-3 Transceiver

The following example shows hardware IDPROM information for an OC-3, short reach, multimode transceiver installed in the first interface port (0) of the SPA located in subslot 2 of the SIP installed in chassis slot 7:

```
Router# show hw-module subslot 7/2 transceiver 0 idprom

IDPROM for transceiver POS7/2/0:
  Description                              = SFP optics (type 3)
  Transceiver Type:                        = OC3 SR-1/STM1 MM (1)
  Product Indentifier (PID)                = TRP-03BCS
  Vendor Revision                          =
  Serial Number (SN)                       = 2169298
  Vendor Name                              = OCP
  Vendor OUI (IEEE company ID)             = 00.00.00 (0)
  Device State                             = Enabled.
  CLEI code                                = ^@^@^Cc#}0^Ll5
  Cisco part number                        = hc?z^B<@^E^R^@
  Date code (yy/mm/dd)                     = 03/04/21
  Connector type                           = LC.
  Encoding                                 = 8B10B
                                             4b5b
                                             NRZ
  Nominal bitrate                          = OC3/STM1 (200 Mbits/s)
  Minimum bit rate as % of nominal bit rate = 68 % of 200 Mbits/s
  Maximum bit rate as % of nominal bit rate = 71 % of 200 Mbits/s
```

Example of the show hw-module subslot transceiver idprom Command for an OC-12 Transceiver

The following example shows hardware IDPROM information for an OC-12, short reach, multimode transceiver installed in the first interface port (0) of the SPA located in subslot 0 of the SIP installed in chassis slot 7:

```
Router# show hw-module subslot 7/0 transceiver 0 idprom
IDPROM for transceiver POS7/0/0:
  Description                              = SFP optics (type 3)
```

```
  Transceiver Type:                          = OC12 SR-1/STM4 MM (8)
  Product Indentifier (PID)                  = TRP-12BCS
  Vendor Revision                            =
  Serial Number (SN)                         = 2177091
  Vendor Name                                = OCP
  Vendor OUI (IEEE company ID)               = 00.00.00 (0)
  Device State                               = Enabled.
  CLEI code                                  = ^@^@^CdZ+{N^\^X
  Cisco part number                          = pk:c^F^K^@
  Date code (yy/mm/dd)                       = 03/05/07
  Connector type                             = LC.
  Encoding                                   = 8B10B
                                               4b5b
                                               NRZ
  Nominal bitrate                            = OC12/STM4 (600 Mbits/s)
  Minimum bit rate as % of nominal bit rate = 92 % of 600 Mbits/s
  Maximum bit rate as % of nominal bit rate = 13 % of 600 Mbits/s
```

Example of the show hw-module subslot transceiver idprom brief Command

The following example shows the operational status of the transceiver installed in the first interface port (0) of the SPA located in subslot 2 of the SIP installed in chassis slot 3:

```
Router# show hw-module subslot 3/2 transceiver 0 idprom brief
IDPROM for transceiver POS3/2/0:
  Description                                = SFP optics (type 3)
  Transceiver Type:                          = OC12 SR-1/STM4 MM (8)
  Product Indentifier (PID)                  = TRP-12BCS
  Vendor Revision                            =
  Serial Number (SN)                         = 2569567
  Vendor Name                                = CISCO-OCP
  Vendor OUI (IEEE company ID)               = 00.00.00 (0)
  Device State                               = Enabled.
  CLEI code                                  = ^@^@^C4]  ^@T(.
  Cisco part number                          = T^W;L^YkcQ7^@
  Date code (yy/mm/dd)                       = 04/03/24
  Connector type                             = LC.
  Encoding                                   = 8B10B
                                               4b5b
                                               NRZ
  Nominal bitrate                            = OC12/STM4 (600 Mbits/s)
  Minimum bit rate as % of nominal bit rate = 92 % of 600 Mbits/s
  Maximum bit rate as % of nominal bit rate = 13 % of 600 Mbits/s
```

Example of the show hw-module subslot transceiver idprom detail Command

The following example shows the detail form of the command for the transceiver installed in the sixth interface port (5) of the SPA located in subslot 0 of the SIP installed in chassis slot 4:

```
Router# show hw-module subslot 4/0 transceiver 5 idprom detail

IDPROM for transceiver GigabitEthernet4/0/6:
  Description                                = SFP optics (type 3)
  Transceiver Type:                          = GE SX (19)
  Product Indentifier (PID)                  = FTRJ8519P1BNL-C3
  Vendor Revision                            = A1
  Serial Number (SN)                         = FNS0821K2J5
  Vendor Name                                = CISCO-FINISAR
```

```
Vendor OUI (IEEE company ID)              = 00.90.65 (36965)
CLEI code                                 = CNUIAAMAAA
Cisco part number                         = 10-1954-01
Device State                              = Enabled.
Date code (yy/mm/dd)                      = 04/05/19
Connector type                            = LC.
Encoding                                  = 8B10B
                                            NRZ
Nominal bitrate                           = 2xFC (2100 Mbits/s)
Minimum bit rate as % of nominal bit rate = not specified
Maximum bit rate as % of nominal bit rate = not specified
Link reach for 9u fiber (km)              = SX(550/270m) (0)
                                            1xFC-MM(500/300m) (0)
                                            2xFC-MM(300/150m) (0)
                                            ESCON-MM(2km) (0)
Link reach for 9u fiber (m)               = SX(550/270m) (0)
                                            1xFC-MM(500/300m) (0)
                                            2xFC-MM(300/150m) (0)
                                            ESCON-MM(2km) (0)
Link reach for 50u fiber (m)              = 2xFC-MM(300/150m) (30)
Link reach for 62.5u fiber (m)            = 2xFC-MM(300/150m) (15)
Nominal laser wavelength                  = 850 nm.
DWDM wavelength fraction                  = 850.0  nm.
Supported options                         = Tx disable
                                            Tx fault signal
                                            Loss of signal (standard implementation)
Supported enhanced options                = Alarms for monitored parameters
Diagnostic monitoring                     = Digital diagnostics supported
                                            Diagnostics are externally calibrated
                                            Rx power measured is "Averagepower"
Transceiver temperature operating range   = -5 C to 85 C (extended)
Minimum operating temperature             = -20 C
Maximum operating temperature             = 90 C
High temperature alarm threshold          = +109.000 C
High temperature warning threshold        = +103.000 C
Low temperature warning threshold         =  -13.000 C
Low temperature  alarm threshold          =  -29.000 C
High voltage alarm threshold              = 3.9000 Volts
High voltage warning threshold            = 3.7000 Volts
Low voltage warning threshold             = 2.9000 Volts
Low voltage alarm threshold               = 2.7000 Volts
High laser bias current alarm threshold   = 15.000 mAmps
High laser bias current warning threshold = 12.000 mAmps
Low laser bias current warning threshold  = 2.000 mAmps
Low laser bias current alarm threshold    = 1.000 mAmps
High transmit power alarm threshold       = 0.7424 mWatts
High transmit power warning threshold     = 0.7424 mWatts
Low transmit power warning threshold      = 0.959 mWatts
Low transmit power alarm threshold        = 0.619 mWatts
High receive power alarm threshold        = 5.9324 mWatts
High receive power warning threshold      = 3.7416 mWatts
Low receive power warning threshold       = 0.751 mWatts
Low receive power alarm threshold         = 0.478 mWatts
External Calibration constant: Rx power4  = 0.000
External Calibration constant: Rx power3  = 0.000
External Calibration constant: Rx power2  = 0.000
External Calibration constant: Rx power1  = 0.212
External Calibration constant: Rx power0  = -1.4294966868
External Calibration: bias current slope  = 1.000
External Calibration: bias current offset = 0
```

Example of the show hw-module subslot transceiver status Command

The following example shows the operational status of the transceiver installed in the third interface port (2) of the SPA located in subslot 0 of the SIP installed in chassis slot 4:

```
Router# show hw-module subslot 4/0 transceiver 2 status
The Transceiver in slot 4 subslot 0 port 2 is enabled.
  Module temperature                = +41.617 C
  Transceiver Tx supply voltage     = 3292.0 uVolts
  Transceiver Tx bias current       = 4840 uAmps
  Transceiver Tx power              = 349.2 uWatts
  Transceiver Rx optical power      = 0.5 uWatts
```

show hw-programmable

To display the current Complex Programmable Logic Device (CPLD) or Field-Programmable Gate Array (FPGA) version in a particular line card on a Cisco ASR 1000 Series Router, use the **showhw-programmable** command in Privileged EXEC configuration mode.

show hw-programmable {**all** | **R0** | **R1** | **F0** | **F1** | **0 . . 5**}

Syntax Description

all	This selects all line card types in a Cisco ASR 1000 Series Router.
R0	RP slot 0. In the Cisco ASR 1006 Routers and Cisco ASR 1013 Routers, it is the lower RP slot. In Cisco ASR 1002 and Cisco ASR 1004, it is the only slot.
R1	RP slot 1. This is only in the Cisco ASR 1006 and Cisco ASR 1013 Routers. It is the higher RP slot.
F0	This is the embedded services processor (ESP) slot 0. In the Cisco ASR 1006 Routers and Cisco ASR 1013 Routers, it is the lower ESP slot. In Cisco ASR 1002 and Cisco ASR 1004, it is the only slot.
F1	This is the embedded services processor (ESP) slot 2. This is only in the Cisco ASR 1006 and Cisco ASR 1013 Routers. It is the higher ESP slot.
0..5	This is one of the SIP carrier card slots. Select a slot number zero (0) through five (5). **Note** A CPLD upgrade cannot be performed in slot 5 in the ASR100-SIP10. Move the CPLD card to another slot.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
3.1S	This command was introduced in Cisco IOS XE Release 3.1S.

Usage Guidelines

This command displays the current CPLD and FPGA versions in a particular card by examining the contents of the hw-programmable package file.

For procedures on performing a CPLD upgrade, see the Upgrading Field Programmable Hardware Devices for Cisco ASR 1000 Series Routers document.

Examples

The following example displays the current CPLD and FPGA versions in slot R0 of the router:

```
Router# show hw-programmable r0
Hw-programmable versions

Slot              CPLD version              FPGA version
```

```
------------------------------------------------------------
R0                10021901                  08112501
```

The following example displays all CPLD and FPGA versions, including RP, ESP, and SIP carrier card:

```
Router# show hw-programmable all
Hw-programmable versions

Slot              CPLD version              FPGA version
------------------------------------------------------------
R0                10021901                  08112501
R1                N/A                       N/A
F0                1001270D                  09081902
F1                1003190E                  10040702
1                 07091401                  N/A
2                 07091401                  N/A
3                 07091401                  N/A
4                 07091401                  N/A
5                 07091401                  N/A
```

Related Commands

Command	Description
upgrade hw-programmable	Performs a Complex Programmable Logic Device (CPLD) or Field-Programmable Gate Array (FPGA) upgrade on a Cisco ASR 1000 Series Router.
show upgrade hw-programmable progress	Displays the progress of the line card-field upgradeable device (LC-FPD) on a Cisco ASR 1000 Series Router.
show upgrade hw-programmable	Displays the names and versions of individual files in the hw_programmable package file.

show icc

To display the information about the interface controller card (ICC) counter and status, use the **showicc** command in user EXEC or privileged EXEC mode.

show icc {**counters** | **flowcontrol** | **mcast** | **status**}

Syntax Description

counters	Displays the counter information.
flowcontrol	Displays the flow control information.
mcast	Displays the multicast information.
status	Displays the status information.

Command Default

This command has no default settings.

Command Modes

User EXEC Privileged EXEC

Command History

Release	Modification
12.2(14)SX	Support for this command was introduced on the Supervisor Engine 720.
12.2(17d)SXB	Support for this command on the Supervisor Engine 2 was extended to Release 12.2(17d)SXB.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

Examples

This example shows how to display the information about the ICC counter:

```
Router>
show icc counters
total tx RPC packets to slot 1 LCP = 0
  detail by request id: (<request-id>=<number-of-packets>)
   2 =0            7 =0            8 =0            10=0
   11=0            12=0            14=0            17=0
   18=0            19=0            20=0
total rx RPC packets from slot 1 LCP = 0
  detail by request id: (<request-id>=<number-of-packets>)
   2 =5            7 =7            8 =11           10=4
   11=1            12=2            14=1            17=67
   18=7            19=159          20=29
total tx MCAST-SP packets to slot 1 LCP = 0
  detail by request id: (<request-id>=<number-of-packets>)
   6 =0            7 =0            8 =0            9 =0
   12=0            14=0
total rx MCAST-SP packets from slot 1 LCP = 0
  detail by request id: (<request-id>=<number-of-packets>)
   6 =1            7 =1            8 =1            9 =1
   12=41           14=67
total tx L3-MGR packets to slot 1 LCP = 0
  detail by request id: (<request-id>=<number-of-packets>)
   1 =0            2 =0            3 =0
total rx L3-MGR packets from slot 1 LCP = 0
```

```
  detail by request id: (<request-id>=<number-of-packets>)
   1 =1            2 =2            3 =1
Router#
```

This example shows how to display the information about the ICC status:

```
Router>
show icc status
Class Name             Msgs Pending  Max Pending  Total Sent
----- ---------------- ------------  -----------  ----------
    2 RPC                         0            3         403
    3 MSC                         0            1           1
    5 L3-MGR                      0            4        4173
   13 TCAM-API                    0           10          26
Router#
```

Related Commands

Command	Description
show interfaces	Displays the status and statistics for the interfaces in the chassis.

show interfaces cem

T o display the statistics of the cem group, use the **showinterfacescem**commandin privilege exec mode.

show interfaces cem *slot*/*subslot*/*port*

Syntax Description

slot	Slot number where the SIP is installed.
subslot	Subslot number of the SIP where CEOPS SPA has been installed and circuit emulation has been configured.
port	Port number of the interface on the CEOPS SPA where circuit emulation has been configured.

Command Default

No default behavior or values

Command Modes

Privilege Exec Mode (Exec)

Command History

Release	Modification
Cisco IOS XE Release 3.3.0S	This command was introduced.

Usage Guidelines

The **showinterfacescem**command has been introduced on Cisco ASR 1000 Series Router in Cisco IOS XE Release 3.3.0S. The command output provides details regarding the various CEM groups configured and the various time slots to which the groups are attached.

Examples

The following example shows the command output of the show interfaces cem command:

```
Router# show interfaces cem 0/1/0
CEM0/1/0 is up, line protocol is up
  Hardware is Circuit Emulation Interface
  MTU 1500 bytes, BW 155520 Kbit/sec, DLY 0 usec,
     reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation CEM, loopback not set
  Keepalive not supported
  Last input never, output never, output hang never
  Last clearing of "show interface" counters never
  Input queue: 0/375/0/0 (size/max/drops/flushes); Total output drops: 0
  Queueing strategy: fifo
  Output queue: 0/0 (size/max)
  5 minute input rate 64000 bits/sec, 250 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
     1779066 packets input, 56930112 bytes, 0 no buffer
     Received 0 broadcasts (0 IP multicasts)
     0 runts, 0 giants, 0 throttles
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     0 packets output, 0 bytes, 0 underruns
     0 output errors, 0 collisions, 0 interface resets
     0 unknown protocol drops
     0 output buffer failures, 0 output buffers swapped out
```

Related Commands

Command	Description
clear interface cem	Clears the cem channel.

show interface history

To display histograms of interface utilization, use the **showinterfacehistory** command in privileged EXEC mode.

show interface [*type number*] **history** [**all** | **60sec** | **60min** | **72hour**] [**both** | **input** | **output**]

Syntax Description

type	(Optional) Interface type.
number	(Optional) Port number of the interface.
all	(Optional) Specifies the histograms representing the last 60 seconds, the last 60 minutes, and the last 72 hours of interface utilization.
60sec	(Optional) Specifies the histograms representing the last 60 seconds of interface utilization.
60min	(Optional) Specifies the histograms representing the last 60 minutes of interface utilization.
72hour	(Optional) Specifies the histograms representing the last 72 hours of interface utilization.
both	(Optional) Specifies both the input histograms and the output histograms.
input	(Optional) Specifies the input histograms.
output	(Optional) Specifies the output histograms.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)XNE	This command was introduced.

Usage Guidelines

The **showinterfacehistory** command displays histograms of interface utilization. The y-axis represents the input or output rate in packets per second, kilobits per second, or megabits per second. Kilobits per second is used when the bandwidth of the interface is less than one gigabit per second. Megabits per second is used for more than one gigabit per second.

The x-axis represents time in units of seconds, minutes or hours with the most current time at the left side of the histogram. There are three histograms available: the last 60 seconds, the last 60 minutes, and the last 72 hours.

The interface counters specified in the **history(interface)** command are displayed under the x-axis of each histogram. Each counter has a five-character identification as listed in the command. The identification is displayed at the beginning of each counter line. The number in the column indicates that the counter incremented by that amount during the specified interval. When the counter exceeds a single digit, the values are displayed vertically.

Examples

The following example shows the histogram output of interface history:

```
Router# show interface gigabitethernet 0/1 history 60min
```

```
5689688755455324777665666876546
      10
       9    *
       8   ** **                  *
       7   *# ##*         ***      #*
       6  *######         ####* **###*  *
       5 ########## *#    #############* *
       4 ##############  *###############**
       3 ############### ################*
       2 ################################
       1 ################################
        0....5....1....1....2....2....3....3....4....4....5....5....6
                  0    5    0    5    0    5    0    5    0    5    0
         33333333333333333333333333333331
   Mlcst 5565555555655555555556553555570000000000000000000000000000
         22322111111     121221211211
         57149774766867 133175814422022
   iDrop 42572763692421926545449684099660000000000000000000000000000
         GigabitEthernet0/1 input rate(mbits/sec)  (last 60 minutes)
                * = maximum   # = average
5677678656555434767665666866545
      10
       9
       8       *                  *
       7   ** *#          * *      *
       6  *#####* *       ##*** ***##*
       5 *###########***   #####*######* *
       4 ##############* *###############**
       3 ##############**################*
       2 ################################
       1 ################################
        0....5....1....1....2....2....3....3....4....4....5....5....6
                  0    5    0    5    0    5    0    5    0    5    0
   Unkno 0000000000000000000000000000000000000000000000000000000000000000
   oDrop 0000000000000000000000000000000000000000000000000000000000000000
         GigabitEthernet0/1 output rate(mbits/sec)  (last 60 minutes)
                * = maximum   # = average
```

The input rate histogram shows that the input rate peaked at 9 Mbps and 4 minutes prior to the command execution. During that one-minute interval, there were 35 input multicast packets and 247 input drops. The counter values in the histogram should be read vertically.

The output rate histogram shows that the output rate reached 8 Mbps twice; once 7 minutes prior and the second time 26 minutes prior to the command execution. There were no unknown protocol drops and no output drops during the last 60 minutes.

The table below describes the significant fields shown in the display.

Table 2: show interface history Field Descriptions

Field	Description
Mlcst	Ethernet input multicast.
iDrop	Input drops.
Unkno	Unknown protocol drops.
oDrop	Output drops.

Related Commands

Command	Description
history (interface)	Enables an interface to maintain utilization history.

show interface sdcc

To display configuration information and statistics for a sections data communications channel (SDCC) interface, use the **showinterfacesdcc** command in privileged EXEC mode.

show interface sdcc *slot/subslot/port*

Syntax Description

slot	Chassis slot number. Refer to the appropriate hardware manual for slot information. For SIPs, refer to the platform-specific SPA hardware installation guide or the corresponding "Identifying Slots and Subslots for SIPs and SPAs" topic in the platform-specific SPA software configuration guide.
/ *subslot*	Secondary slot number on a SPA interface processor (SIP) where a SPA is installed. Refer to the platform-specific SPA hardware installation guide and the corresponding "Specifying the Interface Address on a SPA" topic in the platform-specific SPA software configuration guide for subslot information.
/ *port*	(Optional) Port or interface number. Refer to the appropriate hardware manual for port information. For SPAs, refer to the corresponding "Specifying the Interface Address on a SPA" topics in the platform-specific SPA software configuration guide.

Command Default

No default behavior or values

Command Modes

Privileged EXEC

Command History

Release	Modification
12.2(11)BC3	This command was introduced.
12.2(25)S3	This command was integrated into Cisco IOS Release 12.2(25)S3 to support POS SPAs on the Cisco 7304 router.
12.2(18)SXE	This command was integrated into Cisco IOS Release 12.2(18)SXE to support POS SPAs on the Cisco 7600 series routers and Catalyst 6500 series switches.
12.0(31)S	This command was integrated into Cisco IOS Release 12.0(31)S to support POS SPAs on the Cisco 12000 series routers.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

Examples

Cisco 7600 Series Router and Catalyst 6500 Series Switch Example

The following command displays configuration information and statistics for SDCC interface 7/0/0:

```
Router# show interface sdcc 7/0/0
SDCC7/0/0 is up, line protocol is up
```

```
  Hardware is SDCC
  Internet address is 10.11.11.10/8
  MTU 1500 bytes, BW 192 Kbit, DLY 20000 usec,
     reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation HDLC, crc 16, loopback not set
  Keepalive not set
  Last input 00:00:38, output 00:00:38, output hang never
  Last clearing of "show interface" counters 00:00:48
  Input queue:0/75/0/0 (size/max/drops/flushes); Total output drops:0
  Queueing strategy:fifo
  Output queue:0/40 (size/max)
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
     5 packets input, 520 bytes, 0 no buffer
     Received 0 broadcasts (0 IP multicast)
     0 runts, 0 giants, 0 throttles
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     5 packets output, 520 bytes, 0 underruns
     0 output errors, 0 collisions, 0 interface resets
     0 output buffer failures, 0 output buffers swapped out
     0 carrier transitions
```

Cisco 12000 Series Router Example

The following is sample output from the **showinterfacesdcc**command on a Cisco 12000 series router for POS interface 1/1/0 (which is the interface for port 0 of the SPA in subslot 1 of the SIP in chassis slot 1):

```
Router# show interface sdcc 1/1/0

SDCC1/1/0 is administratively down, line protocol is down
  Hardware is SDCC
  MTU 1500 bytes, BW 192 Kbit, DLY 20000 usec, rely 255/255, load 1/255
  Encapsulation HDLC, crc 32, loopback not set
  Keepalive set (10 sec)
  Last input never, output never, output hang never
  Last clearing of "show interface" counters 00:01:55
  Queueing strategy: fifo
  Output queue 0/40, 0 drops; input queue 0/75, 0 drops
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
     0 packets input, 0 bytes, 0 no buffer
     Received 0 broadcasts, 0 runts, 0 giants, 0 throttles
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     0 packets output, 0 bytes, 0 underruns
     0 output errors, 0 collisions, 0 interface resets
     0 output buffer failures, 0 output buffers swapped out
     0 carrier transitions
```

The table below describes the significant fields shown in these displays.

*Table 3: **show interface sdcc** Field Descriptions*

Field	Description
SDCCx/y/z is up, line protocol is up	Indicates whether the interface hardware is currently active and can transmit and receive or whether it has been taken down by an administrator.

Field	Description
Hardware is. . .	Hardware type: • SDCC-- Section Data Communications Channel
Internet address is	Internet address and subnet mask.
MTU	Maximum transmission unit of the interface.
BW	Bandwidth of the interface, in kilobits per second.
DLY	Delay of the interface, in microseconds.
rely	Reliability of the interface as a fraction of 255 (255/255 is 100 percent reliability), calculated as an exponential average over 5 minutes.
load	Load on the interface as a fraction of 255 (255/255 is completely saturated), calculated as an exponential average over 5 minutes. The calculation uses the value from the **bandwidth** interface configuration command.
Encapsulation	Encapsulation method assigned to interface.
crc	Cyclic redundancy check size (16 or 32 bits).
Loopback	Indicates whether loopback is set.
Keepalive	Indicates whether keepalives are set.
Last input	Number of hours, minutes, and seconds since the last packet was successfully received by an interface and processed locally on the router. Useful for knowing when a dead interface failed. This counter is updated only when packets are process-switched, not when packets are fast-switched.
(Last) output	Number of hours, minutes, and seconds since the last packet was successfully transmitted by an interface. This counter is updated only when packets are process-switched, not when packets are fast-switched.
(Last) output hang	Number of hours, minutes, and seconds (or never) since the interface was last reset because of a transmission that took too long. When the number of hours in any of the “last” fields exceeds 24 hours, the number of days and hours is printed. If that field overflows, asterisks are printed.
Last clearing	Time at which the counters that measure cumulative statistics (such as number of bytes transmitted and received) shown in this report were last reset to zero. Note that variables that might affect routing (for example, load and reliability) are not cleared when the counters are cleared. *** indicates the elapsed time is too large to be displayed. 0:00:00 indicates the counters were cleared more than 2231 ms (and less than 232 ms) ago.
Queueing strategy	First-in, first-out (FIFO) queueing strategy (other queueing strategies you might see are priority-list, custom-list, and weighted fair).

Field	Description
Output queue, drops input queue, drops	Number of packets in output and input queues. Each number is followed by a slash, the maximum size of the queue, and the number of packets dropped because a queue was full.
5 minute input rate 5 minute output rate	Average number of bits and packets received or transmitted per second in the last 5 minutes.
packets input	Total number of error-free packets received by the system.
bytes (input)	Total number of bytes, including data and MAC encapsulation, in the error-free packets received by the system.
no buffer	Number of received packets discarded because there was no buffer space in the main system. Compare with ignored count. Broadcast storms on Ethernets and bursts of noise on serial lines are often responsible for no input buffer events.
broadcasts	Total number of broadcast or multicast packets received by the interface.
runts	Number of packets that are discarded because they are smaller than the minimum packet size of the medium.
giants	Number of packets that are discarded because they exceed the maximum packet size of the medium.
throttles	Not supported for POS interfaces.
parity	Report of the parity errors on the interface.
input errors	Total number of no buffer, runts, giants, CRCs, frame, overrun, ignored, and abort counts. Other input-related errors can also increment the count, so that this sum might not balance with the other counts.
CRC	Cyclic redundancy checksum generated by the originating LAN station or far-end device does not match the checksum calculated from the data received. On a LAN, this usually indicates noise or transmission problems on the LAN interface or the LAN bus itself. A high number of CRCs is usually the result of collisions or a station transmitting bad data. On a serial link, CRCs usually indicate noise, gain hits or other transmission problems on the data link.
frame	Number of packets received incorrectly having a CRC error and a noninteger number of octets. On a serial line, this is usually the result of noise or other transmission problems.
overrun	Number of times the serial receiver hardware was unable to hand received data to a hardware buffer because the input rate exceeded the receiver's ability to handle the data.
ignored	Number of received packets ignored by the interface because the interface hardware ran low on internal buffers. These buffers are different than the system buffers mentioned previously in the buffer description. Broadcast storms and bursts of noise can cause the ignored count to be incremented.

Field	Description
abort	Illegal sequence of one bits on the interface.
packets output	Total number of messages transmitted by the system.
bytes (output)	Total number of bytes, including data and MAC encapsulation, transmitted by the system.
underruns	Number of times that the far-end transmitter has been running faster than the near-end router's receiver can handle.
output errors	Sum of all errors that prevented the final transmission of datagrams out of the interface being examined. Note that this might not balance with the sum of the enumerated output errors, as some datagrams can have more than one error, and others can have errors that do not fall into any of the specifically tabulated categories.
collisions	Not supported for POS interfaces.
interface resets	Number of times an interface has been completely reset. This can happen if packets queued for transmission were not sent within a certain interval. If the system notices that the carrier detect line of an interface is up, but the line protocol is down, it periodically resets the interface in an effort to restart it. Interface resets can also occur when an unrecoverable interface processor error occurred, or when an interface is looped back or shut down.
output buffer failures	Not supported for POS interfaces.
output buffers swapped out	Not supported for POS interfaces.
carrier transitions	Number of times the carrier detect signal of the interface has changed state.

show interfaces

To display statistics for all interfaces configured on the router or access server, use the **show interfaces** command in privileged EXEC mode.

Cisco 2500 Series, Cisco 2600 Series, Cisco 4700 Series, and Cisco 7000 Series
show interfaces [*type number*] [*first*] [*last*] [**accounting**]

Catalyst 6500 Series, Cisco 7200 Series and Cisco 7500 Series with a Packet over SONET Interface Processor
show interfaces [**type slot**/**port**] [**accounting** | **counters protocol status** | **crb** | **dampening** | **description** | **dot1ad** | **etherchannel** [**module number**] | **fair-queue** | **irb** | **mac-accounting** | **mpls-exp** | **precedence** | **random-detect** | **rate-limit** | **stats** | **summary** | **switching** | **utilization** {*type number*}]

Cisco 7500 Series with Ports on VIPs
show interfaces [*type slot*/*port-adapter*/*port*]

Cisco 7600 Series
show interfaces [*type number* | **null** *interface-number* | **vlan** *vlan-id*]

Channelized T3 Shared Port Adapters
show interfaces serial [*slot*/*subslot*/*port*/*t1-num* **:** *channel-group*]

Shared Port Adapters
show interfaces type [*slot*/*subslot*/*port* [/*sub-int*]]

Syntax Description

type	(Optional) Interface type. Allowed values for *type* can be **atm**, **async**, **auto-template**, **bvi**, **bri0**, **ctunnel**, **container**, **dialer**, **e1**, **esconPhy**, **ethernet**, **fastethernet**, **fcpa**, **fddi**, **filter**, **filtergroup**, **gigabitethernet**, **ge-wan**, **hssi**, **longreachethernet**, **loopback**, **mfr**, **multilink**, **module**,**null**, **posport-channel**, , **port-group**, **pos-channel**, **sbc**, **sdcc**, **serial**, **sysclock**, **t1**, **tengigabitethernet**, **token**, **tokenring**, **tunnel**, **vif**, **vmi**, **virtual-access**, **virtual-ppp**, **virtual-template**, **virtual-tokenring**. **voaBypassIn**, **voaBypassOut**, **voaFilterIn**, **voaFilterOut**, **voaIn**, **voaOut**. **Note** The type of interfaces available is based on the type of router used.
number	(Optional) Port number on the selected interface.
first last	(Optional) For Cisco 2500 series routers, ISDN Basic Rate Interfae (BRI) only. The *first* argument can be either 1 or 2. The *last* argument can only be 2, indicating B channels 1 and 2. D-channel information is obtained by using the command without the optional arguments.
accounting	(Optional) Displays the number of packets of each protocol type that have been sent through the interface.

counters protocol status	(Optional) Displays the current status of the protocol counters enabled.
crb	(Optional) Displays interface routing or bridging information.
dampening	(Optional) Displays interface dampening information.
description	(Optional) Displays the interface description.
etherchannel [**module***number*]	(Optional) Displays interface Ether Channel information. • **module** --The **module** keyword limits the display to interfaces available on the module.
fair-queue	(Optional) Displays interface Weighted Fair Queueing (WFQ) information.
irb	(Optional) Displays interface routing or bridging information.
mac-accounting	(Optional) Displays interface MAC accounting information.
mpls-exp	(Optional) Displays interface Multiprotocol Label Switching (MPLS) experimental accounting information.
precedence	(Optional) Displays interface precedence accounting information.
random-detect	(Optional) Displays interface Weighted Random Early Detection (WRED) information.
rate-limit	(Optional) Displays interface rate-limit information.
stats	(Optional) Displays interface packets and octets, in and out, by using switching path.
summary	(Optional) Displays an interface summary.
switching	(Optional) Displays interface switching.
null *interface-number*	(Optional) Specifies the null interface, that is **0**.
slot	(Optional) Slot number. Refer to the appropriate hardware manual for slot information.
/ *port*	(Optional) Port number. Refer to the appropriate hardware manual for port information.
/ *port-adapter*	(Optional) Port adapter number. Refer to the appropriate hardware manual for information about port adapter compatibility.

slot / *subslot* / *port* / *t1-num* **:** *channel-group*	(Optional) Channelized T3 Shared Port Adapters Number of the chassis slot that contains the channelized T3 Shared Port Adapters (SPA) (for example, 5/0/0:23), where: • *slot* --(Optional) Chassis slot number. For SPA interface processors (SIPs), refer to the platform-specific SPA hardware installation guide or the corresponding "Identifying Slots and Subslots for SIPs and SPAs" topic in the platform-specific SPA software configuration guide. • **/** *subslot*-- (Optional) Secondary slot number on a SIP where a SPA is installed. Refer to the platform-specific SPA hardware installation guide and the corresponding "Specifying the Interface Address on a SPA" topic in the platform-specific SPA software configuration guide for subslot information. • **/** *port* --(Optional) Port or interface number. For SPAs, refer to the corresponding "Specifying the Interface Address on a SPA" topic in the platform-specific SPA software configuration guide. • **/** *t1-num*-- (Optional) T1 time slot in the T3 line. The value can be from 1 to 28. • **:** *channel-group*-- (Optional) Number 0-23 of the DS0 link on the T1 channel.
[*slot*/*subslot*/*port*/*sub-int*]]	(Optional) Shared Port Adapters Number of the chassis slot that contains the SPA interface (for example, 4/3/0), where: • *slot* --(Optional) Chassis slot number. For SIPs, refer to the platform-specific SPA hardware installation guide or the corresponding "Identifying Slots and Subslots for SIPs and SPAs" topic in the platform-specific SPA software configuration guide. • **/** *subslot*-- (Optional)Secondary slot number on a SIP where a SAP is installed. Refer to the platform-specific SPA hardware installation guide and the corresponding "Specifying the Interface Address on a SPA" topic in the platform-specific SPA software configuration guide for subslot information. • **/** *port* --(Optional) Port or interface number. For SPAs, refer to the corresponding "Specifying the Interface Address on a SPA" topics in the platform-specific SPA software configuration guide. • **/** *sub-int* -- (Optional) Subinterface number (for those SPAs that support subinterface configuration).
vlan *vlan-id*	(Optional) Specifies the VLAN ID; valid values are from 1 to 4094.

Command Modes

User EXEC (>)

Privileged EXEC (#)

Command History

Release	Modification
10.0	This command was introduced.
12.0(3)T	This command was modified to include support for flow-based WRED .
12.0(4)T	This command was modified to include enhanced display information for dialer bound interfaces.
12.0(7)T	This command was modified to include **dialer** as an interface type and to reflect the default behavior.
12.2(14)S	This command was integrated into Cisco IOS Release 12.2(14)S.
12.2(20)S2	This command was integrated into Cisco IOS Release 12.2(20)S2 and introduced a new address format and output for SPA interfaces on the Cisco 7304 router. The *subslot* argument was introduced.
12.2(25)S3	This command was integrated into Cisco IOS Release 12.2(25)S3.
12.2(14)SX	This command was modified. Support for this command was added for the Supervisor Engine 720.
12.2(17d)SXB	This command was modified. Support for this command on the Supervisor Engine 2 was extended to Cisco IOS Release 12.2SX. The uplink dual-mode port information was updated.
12.2(18)SXE	This command was integrated into Cisco IOS Release 12.2(18)SXE to support SPAs on the Cisco 7600 series routers and Catalyst 6500 series switches.
2.2(33)SXJ01	This command was integrated into Cisco IOS Release 12.2(33)SXJ01.
12.0(31)S	This command was integrated into Cisco IOS Release 12.0(31)S to support SPAs on the Cisco 12000 series routers, and the **tengigabitethernet** interface type was added. 10-Gigabit Ethernet interfaces were introduced with the release of the 1-Port 10-Gigabit Ethernet SPA.
12.2(18)SXF	This command was integrated into Cisco IOS Release 12.2(18)SXF.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(33)SRB1	This command was updated to display operational status for Gigabit Ethernet interfaces that are configured as primary and backup interfaces (Cisco 7600 series routers).
12.2(31)SB	This command was integrated in Cisco IOS Release 12.2(31)SB.
12.2(33)SB	This command was modified. The default value of the command was modified on the Cisco 10000 series router for the PRE3 and PRE4.

Release	Modification
Cisco IOS XE Release 2.5	This command was implemented on Cisco ASR 1000 Series Aggregation Services Routers.
12.2(50)SY	This command was integrated in Cisco IOS Release 12.2(50)SY and the dot1ad keyword was added.
15.1(01)SY	This command was integrated in Cisco IOS Release 15.1(50)SY.

Usage Guidelines

Display Interpretation

The **show interfaces** command displays statistics for the network interfaces. The resulting output varies, depending on the network for which an interface has been configured. The resulting display on the Cisco 7200 series routers shows the interface processors in slot order. If you add interface processors after booting the system, they will appear at the end of the list, in the order in which they were inserted.

Information About Specific Interfaces

The *number* argument designates the module and port number. If you use the **show interfaces** command on the Cisco 7200 series routers without the *slot*/*port* arguments, information for all interface types will be shown. For example, if you type **show interfaces** you will receive information for all Ethernet, serial, Token Ring, and FDDI interfaces. Only by adding the type *slot*/*port* argument you can specify a particular interface.

Cisco 7600 Series Routers

Valid values for the *number* argument depend on the specified interface type and the chassis and module that are used. For example, if you specify a Gigabit Ethernet interface and have a 48-port 10/100BASE-T Ethernet module that is installed in a 13-slot chassis, valid values for the module number are from 1 to 13 and valid values for the port number are from 1 to 48.

The port channels from 257 to 282 are internally allocated and are supported on the Content Switching Module (CSM) and the Firewall Services Module (FWSM) only.

Statistics are collected on a per-VLAN basis for Layer 2-switched packets and Layer 3-switched packets. Statistics are available for both unicast and multicast traffic. The Layer 3-switched packet counts are available for both ingress and egress directions. The per-VLAN statistics are updated every 5 seconds.

In some cases, you might see a difference in the duplex mode that is displayed between the **show interfaces** command and the **show running-config**commands. In this case, the duplex mode that is displayed in the **show interfaces** command is the actual duplex mode that the interface is running. The **show interfaces** command shows the operating mode for an interface, and the **show running-config** command shows the configured mode for an interface.

If you do not enter any keywords, all counters for all modules are displayed.

Command Variations

You will use the **show interfaces** command frequently while configuring and monitoring devices. The various forms of the **show interfaces** commands are described in detail in the sections that follow.

Dialer Interfaces Configured for Binding

If you use the **show interfaces** command on dialer interfaces configured for binding, the display will report statistics on each physical interface bound to the dialer interface; see the following examples for more information.

Removed Interfaces

If you enter a **show interfaces** command for an interface type that has been removed from the router or access server, interface statistics will be displayed accompanied by the following text: "Hardware has been removed."

Weighted Fair Queueing Information

If you use the **show interfaces** command on a router or access server for which interfaces are configured to use weighted fair queueing through the **fair-queue** interface command, additional information is displayed. This information consists of the current and high-water mark number of flows.

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In Cisco IOS Release 12.2(33)SB, when a multilink PPP (MLP) interface is down/down, its default bandwidth rate is the sum of the serial interface bandwidths associated with the MLP interface.

In Cisco IOS Release 12.2(31)SB, the default bandwidth rate is 64 Kbps.

Examples

The following is sample output from the **show interfaces** command. Because your display will depend on the type and number of interface cards in your router or access server, only a portion of the display is shown.

Note If an asterisk (*) appears after the throttles counter value, it means that the interface was throttled at the time the command was run.

```
Router# show interfaces
Ethernet 0 is up, line protocol is up
  Hardware is MCI Ethernet, address is 0000.0c00.750c (bia 0000.0c00.750c)
  Internet address is 10.108.28.8, subnet mask is 255.255.255.0
  MTU 1500 bytes, BW 10000 Kbit, DLY 100000 usec, rely 255/255, load 1/255
  Encapsulation ARPA, loopback not set, keepalive set (10 sec)
  ARP type: ARPA, ARP Timeout 4:00:00
  Last input 0:00:00, output 0:00:00, output hang never
  Last clearing of "show interface" counters 0:00:00
  Output queue 0/40, 0 drops; input queue 0/75, 0 drops
  Five minute input rate 0 bits/sec, 0 packets/sec
  Five minute output rate 2000 bits/sec, 4 packets/sec
     1127576 packets input, 447251251 bytes, 0 no buffer
     Received 354125 broadcasts, 0 runts, 0 giants, 57186* throttles
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     5332142 packets output, 496316039 bytes, 0 underruns
     0 output errors, 432 collisions, 0 interface resets, 0 restarts
.
.
.
```

Example with Custom Output Queueing

The following example shows partial sample output when custom output queueing is enabled:

```
Router# show interfaces
Last clearing of "show interface" counters 0:00:06
Input queue: 0/75/0 (size/max/drops); Total output drops: 21
Output queues: (queue #: size/max/drops)
     0: 14/20/14  1: 0/20/6  2: 0/20/0 3: 0/20/0 4: 0/20/0 5: 0/20/0
     6: 0/20/0 7: 0/20/0  8: 0/20/0  9: 0/20/0  10: 0/20/0
.
```

.
.

When custom queueing is enabled, the drops accounted for in the output queues result from bandwidth limitation for the associated traffic and lead to queue length overflow. Total output drops include drops on all custom queues and the system queue. Fields are described with the weighted fair queueing output in the table below.

Example Including Weighted-Fair-Queueing Output

For each interface on the router or access server configured to use weighted fair queueing, the **show interfaces** command displays the information beginning with *Inputqueue***:** in the following display:

```
Router# show interfaces
Ethernet 0 is up, line protocol is up
  Hardware is MCI Ethernet, address is 0000.0c00.750c (bia 0000.0c00.750c)
  Internet address is 10.108.28.8, subnet mask is 255.255.255.0
  MTU 1500 bytes, BW 10000 Kbit, DLY 100000 usec, rely 255/255, load 1/255
  Encapsulation ARPA, loopback not set, keepalive set (10 sec)
  ARP type: ARPA, ARP Timeout 4:00:00
  Last input 0:00:00, output 0:00:00, output hang never
  Last clearing of "show interface" counters 0:00:00
  Output queue 0/40, 0 drops; input queue 0/75, 0 drops
  Five minute input rate 0 bits/sec, 0 packets/sec
  Five minute output rate 2000 bits/sec, 4 packets/sec
     1127576 packets input, 447251251 bytes, 0 no buffer
     Received 354125 broadcasts, 0 runts, 0 giants, 57186* throttles
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     5332142 packets output, 496316039 bytes, 0 underruns
     0 output errors, 432 collisions, 0 interface resets, 0 restarts
Input queue: 0/75/0 (size/max/drops); Total output drops: 0
Output queue: 7/64/0 (size/threshold/drops)
         Conversations 2/9 (active/max active)
```

The table below describes the input queue and output queue fields shown in the preceding two displays.

Table 4: Weighted-Fair-Queueing Output Field Descriptions

Field	Description
Input Queue	Current size of the input queue.
size	
max	Maximum size of the queue.
drops	Number of messages discarded in this interval.
Total output drops	Total number of messages discarded in this session.
Output Queue	Current size of the output queue.
size	
threshold	Congestive-discard threshold. Number of messages in the queue after which new messages for high-bandwidth conversations are dropped.

Field	Description
drops	Number of dropped messages.
Conversations: active	Number of currently active conversations.
Conversations: max active	Maximum number of concurrent conversations allowed.

Example with Accounting Option

To display the number of packets of each protocol type that have been sent through all configured interfaces, use the **show interfaces accounting** command. When you use the **accounting** option, only the accounting statistics are displayed.

Note Except for protocols that are encapsulated inside other protocols, such as IP over X.25, the accounting option also shows the total bytes sent and received, including the MAC header. For example, it totals the size of the Ethernet packet or the size of a packet that includes High-Level Data Link Control (HDLC) encapsulation.

Per-packet accounting information is kept for the following protocols:

- AppleTalk
- Address Resolution Protocol (ARP) (for IP, Frame Relay, Switched Multimegabit Data Service (SMDS))
- Connectionless Network Service (CLNS)
- Digital Equipment Corporation (DEC) Maintenance Operations Protocol (MOP)

The routers use MOP packets to advertise their existence to Digital Equipment Corporation machines that use the MOP. A router periodically broadcasts MOP packets to identify itself as a MOP host. This results in MOP packets being counted, even when DECnet is not being actively used.

- DECnet
- HP Probe
- IP
- LAN Manager (LAN Network Manager and IBM Network Manager)
- Novell
- Serial Tunnel Synchronous Data Link Control (SDLC)
- Spanning Tree
- SR Bridge
- Transparent Bridge

Example with DWRED

The following is sample output from the **show interfaces** command when distributed WRED (DWRED) is enabled on an interface. Notice that the packet drop strategy is listed as "VIP-based weighted RED."

```
Router# show interfaces hssi 0/0/0
Hssi0/0/0 is up, line protocol is up
  Hardware is cyBus HSSI
  Description: 45Mbps to R1
Internet address is 10.200.14.250/30
MTU 4470 bytes, BW 45045 Kbit, DLY 200 usec, rely 255/255, load 1/255
Encapsulation HDLC, loopback not set, keepalive set (10 sec)
Last input 00:00:02, output 00:00:03, output hang never
Last clearing of "show interface" counters never
Queueing strategy: fifo
Packet Drop strategy: VIP-based weighted RED
Output queue 0/40, 0 drops; input queue 0/75, 0 drops
5 minute input rate 0 bits/sec, 0 packets/sec
5 minute output rate 0 bits/sec, 0 packets/sec
1976 packets input, 131263 bytes, 0 no buffer
Received 1577 broadcasts, 0 runts, 0 giants
0 parity
4 input errors, 4 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
1939 packets output, 130910 bytes, 0 underruns
0 output errors, 0 applique, 3 interface resets
0 output buffers copied, 0 interrupts, 0 failures
```

Example with ALC

The following is sample output from the **show interfaces** command for serial interface 2 when Airline Control (ALC) Protocol is enabled:

```
Router# show interfaces serial 2
Serial2 is up, line protocol is up
Hardware is CD2430
MTU 1500 bytes, BW 115 Kbit, DLY 20000 usec, rely 255/255, load 1/255
Encapsulation ALC, loopback not set
Full-duplex enabled.
     ascus in UP state: 42, 46
     ascus in DOWN state:
     ascus DISABLED:
Last input never, output never, output hang never
Last clearing of "show interface" counters never
Queueing strategy: fifo
Output queue 0/40, 0 drops; input queue 0/75, 0 drops
5 minute input rate 0 bits/sec, 0 packets/sec
5 minute output rate 0 bits/sec, 0 packets/sec
0 packets input, 0 bytes, 0 no buffer
Received 0 broadcasts, 0 runts, 0 giants
0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
0 packets output, 0 bytes, 0 underruns
0 output errors, 0 collisions, 3 interface resets
0 output buffer failures, 0 output buffers swapped out
DCD=down  DSR=down  DTR=down  RTS=down  CTS=down
```

Example with SDLC

The following is sample output from the **show interfaces** command for an SDLC primary interface supporting the SDLC function:

```
Router# show interfaces
Serial 0 is up, line protocol is up
 Hardware is MCI Serial
 MTU 1500 bytes, BW 1544 Kbit, DLY 20000 usec, rely 255/255, load 1/255
 Encapsulation SDLC-PRIMARY, loopback not set
      Timers (msec): poll pause 100 fair poll 500. Poll limit 1
      [T1 3000, N1 12016, N2 20, K 7] timer: 56608 Last polled device: none
      SDLLC [ma: 0000.0C01.14--, ring: 7 bridge: 1, target ring: 10
             largest token ring frame 2052]
SDLC addr C1 state is CONNECT
       VS 6, VR 3, RCNT 0, Remote VR 6, Current retransmit count 0
       Hold queue: 0/12 IFRAMEs 77/22 RNRs 0/0 SNRMs 1/0 DISCs 0/0
       Poll: clear, Poll count: 0, chain: p: C1 n: C1
       SDLLC [largest SDLC frame: 265, XID: disabled]
  Last input 00:00:02, output 00:00:01, output hang never
  Output queue 0/40, 0 drops; input queue 0/75, 0 drops
  Five minute input rate 517 bits/sec, 30 packets/sec
  Five minute output rate 672 bits/sec, 20 packets/sec
       357 packets input, 28382 bytes, 0 no buffer
       Received 0 broadcasts, 0 runts, 0 giants
       0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
       926 packets output, 77274 bytes, 0 underruns
       0 output errors, 0 collisions, 0 interface resets, 0 restarts
       2 carrier transitions
```

The table below shows the fields relevant to all SDLC connections.

*Table 5: **show interfaces** Field Descriptions When SDLC Is Enabled*

Field	Description
Timers (msec)	List of timers in milliseconds.
poll pause, fair poll, Poll limit	Current values of these timers.
T1, N1, N2, K	Current values for these variables.

The table below shows other data given for each SDLC secondary interface configured to be attached to this interface.

Table 6: SDLC Field Descriptions

Field	Description
addr	Address of this secondary interface.

Field	Description
State	Current state of this connection. The possible values follow: • BOTHBUSY--Both sides have told each other that they are temporarily unable to receive any more information frames. • CONNECT--A normal connect state exists between this router and this secondary. • DISCONNECT--No communication is being attempted to this secondary. • DISCSENT--This router has sent a disconnect request to this secondary and is awaiting its response. • ERROR--This router has detected an error, and is waiting for a response from the secondary acknowledging this. • SNRMSENT--This router has sent a connect request (SNRM) to this secondary and is awaiting its response. • THEMBUSY--This secondary has told this router that it is temporarily unable to receive any more information frames. • USBUSY--This router has told this secondary that it is temporarily unable to receive any more information frames.
VS	Sequence number of the next information frame this station sends.
VR	Sequence number of the next information frame from this secondary that this station expects to receive.
RCNT	Number of correctly sequenced I-frames received when the Cisco IOS software was in a state in which it is acceptable to receive I-frames.
Remote VR	Last frame transmitted by this station that has been acknowledged by the other station.
Current retransmit count	Number of times the current I-frame or sequence of I-frames has been retransmitted.
Hold queue	Number of frames in hold queue/Maximum size of hold queue.
IFRAMEs, RNRs, SNRMs, DISCs	Sent and received count for these frames.
Poll	“Set” if this router has a poll outstanding to the secondary; “clear” if it does not.
Poll count	Number of polls, in a row, given to this secondary at this time.
chain	Shows the previous (p) and next (n) secondary address on this interface in the round-robin loop of polled devices.

Sample show interfaces accounting Display

The following is sample output from the **show interfaces accounting** command:

```
Router# show interfaces accounting
Interface TokenRing0 is disabled
Ethernet0
                Protocol    Pkts In   Chars In   Pkts Out  Chars Out
                      IP     873171  735923409      34624    9644258
                  Novell     163849   12361626      57143    4272468
                 DEC MOP          0          0          1         77
                     ARP      69618    4177080       1529      91740
Interface Serial0 is disabled
Ethernet1
                Protocol    Pkts In   Chars In   Pkts Out  Chars Out
                      IP          0          0         37      11845
                  Novell          0          0       4591     275460
                 DEC MOP          0          0          1         77
                     ARP          0          0          7        420
Interface Serial1 is disabled
Interface Ethernet2 is disabled
Interface Serial2 is disabled
Interface Ethernet3 is disabled
Interface Serial3 is disabled
Interface Ethernet4 is disabled
Interface Ethernet5 is disabled
Interface Ethernet6 is disabled
Interface Ethernet7 is disabled
Interface Ethernet8 is disabled
Interface Ethernet9 is disabled
Fddi0
                Protocol    Pkts In   Chars In   Pkts Out  Chars Out
                  Novell          0          0       183      11163
                     ARP          1         49         0          0
```

When the output indicates that an interface is " disabled," the router has received excessive errors (over 5000 in a keepalive period).

Example with Flow-Based WRED

The following is sample output from the **show interfaces** command issued for the serial interface 1 for which flow-based WRED is enabled. The output shows that there are 8 active flow-based WRED flows, that the maximum number of flows active at any time is 9, and that the maximum number of possible flows configured for the interface is 16:

```
Router# show interfaces serial 1
Serial1 is up, line protocol is up
  Hardware is HD64570
  Internet address is 10.1.2.1/24
  MTU 1500 bytes, BW 1544 Kbit, DLY 20000 usec,
Reliability 255/255, txload 237/255, rxload 1/255
  Encapsulation HDLC, loopback not set
  Keepalive not set
  Last input 00:00:22, output 00:00:00, output hang never
  Last clearing of "show interface" counters 00:17:58
  Input queue: 0/75/0 (size/max/drops); Total output drops: 2479
Queueing strategy: random early detection(RED)
    flows (active/max active/max): 8/9/16
```

```
  mean queue depth: 27
  drops: class  random   tail     min-th   max-th   mark-prob
         0      946      0        20       40       1/10
         1      488      0        22       40       1/10
         2      429      0        24       40       1/10
         3      341      0        26       40       1/10
         4      235      0        28       40       1/10
         5      40       0        31       40       1/10
         6      0        0        33       40       1/10
         7      0        0        35       40       1/10
         rsvp   0        0        37       40       1/10
  30 second input rate 1000 bits/sec, 2 packets/sec
  30 second output rate 119000 bits/sec, 126 packets/sec
     1346 packets input, 83808 bytes, 0 no buffer
     Received 12 broadcasts, 0 runts, 0 giants, 0 throttles
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     84543 packets output, 9977642 bytes, 0 underruns
     0 output errors, 0 collisions, 6 interface resets
     0 output buffer failures, 0 output buffers swapped out
     0 carrier transitions
     DCD=up  DSR=up  DTR=up  RTS=up  CTS=up
```

Example with DWFQ

The following is sample output from the **show interfaces** command when distributed weighted fair queueing (DWFQ) is enabled on an interface. Notice that the queueing strategy is listed as "VIP-based fair queueing."

```
Router# show interfaces fastethernet 1/1/0
Fast Ethernet 1/1/0 is up, line protocol is up
  Hardware is cyBus Fast Ethernet Interface, address is 0007.f618.4448 (bia 00e0)
  Description: pkt input i/f for WRL tests (to pagent)
  Internet address is 10.0.2.70/24
  MTU 1500 bytes, BW 100000 Kbit, DLY 100 usec, rely 255/255, load 1/255
  Encapsulation ARPA, loopback not set, keepalive not set, fdx, 100BaseTX/FX
  ARP type: ARPA, ARP Timeout 04:00:00
  Last input never, output 01:11:01, output hang never
  Last clearing of "show interface" counters 01:12:31
  Queueing strategy: VIP-based fair queueing
  Output queue 0/40, 0 drops; input queue 0/75, 0 drops
  30 second input rate 0 bits/sec, 0 packets/sec
  30 second output rate 0 bits/sec, 0 packets/sec
     0 packets input, 0 bytes, 0 no buffer
     Received 0 broadcasts, 0 runts, 0 giants
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     0 watchdog, 0 multicast
     0 input packets with dribble condition detected
     1 packets output, 60 bytes, 0 underruns
     0 output errors, 0 collisions, 0 interface resets
     0 babbles, 0 late collision, 0 deferred
     0 lost carrier, 0 no carrier
     0 output buffers copied, 0 interrupts, 0 failures
```

Example with DNIS Binding

When the **show interfaces** command is issued on an unbound dialer interface, the output looks as follows:

```
Router# show interfaces dialer 0
Dialer0 is up (spoofing), line protocol is up (spoofing)
  Hardware is Unknown
  Internet address is 10.1.1.2/8
  MTU 1500 bytes, BW 64 Kbit, DLY 20000 usec, rely 255/255, load 3/255
  Encapsulation PPP, loopback not set
  DTR is pulsed for 1 seconds on reset
  Last input 00:00:34, output never, output hang never
  Last clearing of "show interface" counters 00:05:09
  Queueing strategy: fifo
  Output queue 0/40, 0 drops; input queue 0/75, 0 drops
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 1000 bits/sec, 0 packets/sec
     18 packets input, 2579 bytes
     14 packets output, 5328 bytes
```

But when the **show interfaces** command is issued on a bound dialer interface, you will get an additional report that indicates the binding relationship. The output is shown here:

```
Router# show interfaces dialer 0
Dialer0 is up, line protocol is up
  Hardware is Unknown
  Internet address is 10.1.1.2/8
  MTU 1500 bytes, BW 64 Kbit, DLY 20000 usec, rely 255/255, load 1/255
  Encapsulation PPP, loopback not set
  DTR is pulsed for 1 seconds on reset
  Interface is bound to BRI0:1
  Last input 00:00:38, output never, output hang never
  Last clearing of "show interface" counters 00:05:36
Queueing strategy: fifo
  Output queue 0/40, 0 drops; input queue 0/75, 0 drops
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
     38 packets input, 4659 bytes
     34 packets output, 9952 bytes
Bound to:
BRI0:1 is up, line protocol is up
  Hardware is BRI
  MTU 1500 bytes, BW 64 Kbit, DLY 20000 usec, rely 255/255, load 1/255
  Encapsulation PPP, loopback not set, keepalive not set
  Interface is bound to Dialer0 (Encapsulation PPP)
  LCP Open, multilink Open
  Last input 00:00:39, output 00:00:11, output hang never
  Last clearing of "show interface" counters never
  Queueing strategy: fifo
  Output queue 0/40, 0 drops; input queue 0/75, 0 drops
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
     78 packets input, 9317 bytes, 0 no buffer
     Received 65 broadcasts, 0 runts, 0 giants, 0 throttles
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     93 packets output, 9864 bytes, 0 underruns
     0 output errors, 0 collisions, 7 interface resets
     0 output buffer failures, 0 output buffers swapped out
     4 carrier transitions
```

At the end of the Dialer0 output, the **show interfaces** command is executed on each physical interface bound to it.

The following is sample output from the **show interfaces dialer stats** command:

```
Router# show interfaces dialer 0 stats
```

```
Dialer0
  Switching path    Pkts In   Chars In   Pkts Out  Chars Out
       Processor          0          0          6       1694
       Route cache  2522229  610372530     720458  174343542
             Total  2522229  610372530     720464  174345236
```

Example with BRI

In this example, the physical interface is the B1 channel of the BRI0 link. This example also illustrates that the output under the B channel keeps all hardware counts that are not displayed under any logical or virtual access interface. The line in the report that states “Interface is bound to Dialer0 (Encapsulation LAPB)” indicates that the B interface is bound to Dialer0 and the encapsulation running over this connection is Link Access Procedure, Balanced (LAPB), not PPP, which is the encapsulation configured on the D interface and inherited by the B channel.

```
Router# show interfaces bri0:1
BRI0:1 is up, line protocol is up
  Hardware is BRI
  MTU 1500 bytes, BW 64 Kbit, DLY 20000 usec, rely 255/255, load 1/255
  Encapsulation PPP, loopback not set, keepalive not set

Interface is bound to Dialer0 (Encapsulation LAPB)
  LCP Open, multilink Open
  Last input 00:00:31, output 00:00:03, output hang never
  Last clearing of “show interface” counters never
  Queueing strategy: fifo
  Output queue 0/40, 0 drops; input queue 0/75, 0 drops
  5 minute input rate 0 bits/sec, 1 packets/sec
  5 minute output rate 0 bits/sec, 1 packets/sec
     110 packets input, 13994 bytes, 0 no buffer
     Received 91 broadcasts, 0 runts, 0 giants, 0 throttles
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     135 packets output, 14175 bytes, 0 underruns
     0 output errors, 0 collisions, 12 interface resets
     0 output buffer failures, 0 output buffers swapped out
     8 carrier transitions
```

Any protocol configuration and states should be displayed from the Dialer0 interface.

Example with a Fast Ethernet SPA on a Cisco 7304 Router

The following is sample output from the **show interfaces fastethernet** command for the second interface (port 1) in a 4-Port 10/100 Fast Ethernet SPA located in the bottom subslot (1) of the Modular Service Cards (MSC) that is installed in slot 2 on a Cisco 7304 router:

```
Router# show interfaces fastethernet 2/1/1
FastEthernet2/1/1 is up, line protocol is up
  Hardware is SPA-4FE-7304, address is 00b0.64ff.5d80 (bia 00b0.64ff.5d80)
  Internet address is 192.168.50.1/24
  MTU 9216 bytes, BW 100000 Kbit, DLY 100 usec,
     reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation ARPA, loopback not set
  Keepalive set (10 sec)
  Full-duplex, 100Mb/s, 100BaseTX/FX
ARP type: ARPA, ARP Timeout 04:00:00
  Last input 00:00:22, output 00:00:02, output hang never
  Last clearing of "show interface" counters never
```

```
  Input queue: 0/75/0/0 (size/max/drops/flushes); Total output drops: 0
  Queueing strategy: fifo
  Output queue: 0/40 (size/max)
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
     5 packets input, 320 bytes
     Received 1 broadcasts (0 IP multicast)
     0 runts, 0 giants, 0 throttles
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored
     0 watchdog
     0 input packets with dribble condition detected
     8 packets output, 529 bytes, 0 underruns
     0 output errors, 0 collisions, 2 interface resets
     0 babbles, 0 late collision, 0 deferred
     2 lost carrier, 0 no carrier
     0 output buffer failures, 0 output buffers swapped out
```

Example for an Interface with an Asymmetric Receiver and Transmitter Rates

```
Router# show interfaces e4/0
Ethernet4/0 is up, line protocol is up
  Hardware is AmdP2, address is 000b.bf30.f470 (bia 000b.bf30.f470)
  Internet address is 10.1.1.9/24
  MTU 1500 bytes, BW 10000 Kbit, RxBW 5000 Kbit, DLY 1000 usec,
     reliability 255/255, txload 1/255, rxload 254/255
  Encapsulation ARPA, loopback not set
  Keepalive set (10 sec)
  ARP type: ARPA, ARP Timeout 04:00:00
  Last input 00:00:00, output 00:00:01, output hang never
  Last clearing of "show interface" counters 00:03:36
  Input queue: 34/75/0/819 (size/max/drops/flushes); Total output drops: 0
  Queueing strategy: fifo
  Output queue: 0/40 (size/max)
  30 second input rate 7138000 bits/sec, 14870 packets/sec
  30 second output rate 0 bits/sec, 0 packets/sec
     3109298 packets input, 186557880 bytes, 0 no buffer
     Received 217 broadcasts, 0 runts, 0 giants, 0 throttles
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored
     0 input packets with dribble condition detected
     22 packets output, 1320 bytes, 0 underruns
     11 output errors, 26 collisions, 0 interface resets
     0 babbles, 0 late collision, 0 deferred
     0 lost carrier, 0 no carrier
     0 output buffer failures, 0 output buffers swapped out
```

The table below describes the significant fields shown in the display.

Table 7: show interfaces fastethernet Field Descriptions--Fast Ethernet SPA

Field	Description
Fast Ethernet...is up ...is administratively down	Indicates whether the interface hardware is currently active and if it has been taken down by an administrator.
line protocol is	Indicates whether the software processes that handle the line protocol consider the line usable or if it has been taken down by an administrator.
Hardware	Hardware type (for example, SPA-4FE-7304) and MAC address.

Field	Description
Description	Alphanumeric string identifying the interface. This appears only if the **description** interface configuration command has been configured on the interface.
Internet address	Internet address followed by subnet mask.
MTU	Maximum transmission unit of the interface. The default is 1500 bytes for the 4-Port 10/100 Fast Ethernet SPA.
BW	Bandwidth of the interface in kilobits per second.
RxBW	Receiver bandwidth of the interface, in kilobits per second. This value is displayed only when an interface has asymmetric receiver and transmitter rates.
DLY	Delay of the interface in microseconds.
reliability	Reliability of the interface as a fraction of 255 (255/255 is 100 percent reliability), calculated as an exponential average over 5 minutes.
txload, rxload	Load on the interface (in the transmit "tx" and receive "rx" directions) as a fraction of 255 (255/255 is completely saturated), calculated as an exponential average over 5 minutes.
Encapsulation	Encapsulation method assigned to the interface.
loopback	Indicates whether loopback is set.
Keepalive	Indicates whether keepalives are set, and the time interval.
Half-duplex, Full-duplex	Indicates the duplex mode for the interface.
100Mb/s, 10Mb/s	Speed of the interface in megabits per second.
100BaseTX/FX	Media protocol standard.
ARP type:	Type of ARP assigned and the timeout period.
Last input	Number of hours, minutes, and seconds since the last packet was successfully received by an interface and processed locally on the router. Useful for knowing when a dead interface failed. This field is not updated by fast-switched traffic.
output	Number of hours, minutes, and seconds since the last packet was successfully transmitted by the interface. Useful for knowing when a dead interface failed.
output hang	Number of hours, minutes, and seconds (or never) since the interface was last reset because of a transmission that took too long. When the number of hours in any of the "last" fields exceeds 24 hours, the number of days and hours is displayed. If that field overflows, asterisks are printed. **Note** This field does not apply to SPA interfaces.

Field	Description
Last clearing	Time at which the counters that measure cumulative statistics (such as number of bytes transmitted and received) shown in this report were last reset to zero. Note that variables that might affect routing (for example, load and reliability) are not cleared when the counters are cleared. A series of asterisks (***) indicates the elapsed time is too large to be displayed. 0:00:00 indicates the counters were cleared more than 231 ms (and less than 232 ms) ago.
Input queue (size/max/drops/flushes)	Packet statistics on the input queue reported as: • Size--Number of packets in the input queue. • Max--Maximum size of the queue. • Drops--Number of packets dropped because of a full input queue. • Flushes--Number of packets dropped as part of selective packet discard (SPD). SPD implements a selective packet drop policy on the router's IP process queue. Therefore, it applies only to process-switched traffic.
Total output drops	Total number of packets dropped because of a full output queue.
Queueing strategy	Type of Layer 3 queueing active on this interface. The default is first-in, first-out (FIFO).
Output queue (size/max)	Number of packets in the output queue (size), and the maximum size of the queue (max).
5 minute input rate, 5 minute output rate	Average number of bits and packets transmitted per second in the last 5 minutes. If the interface is not in promiscuous mode, it senses network traffic it sends and receives (rather than all network traffic). The 5-minute input and output rates should be used only as an approximation of traffic per second during a given 5-minute period. These rates are exponentially weighted averages with a time constant of 5 minutes. A period of four time constants must pass before the average will be within two percent of the instantaneous rate of a uniform stream of traffic over that period.
packets input	Total number of error-free packets received by the system.
bytes	Total number of bytes, including data and MAC encapsulation, in the error-free packets received by the system.
Received...broadcasts	Total number of broadcast or multicast packets received by the interface.
runts	Number of packets that are discarded because they are smaller than the minimum packet size of the medium. For instance, any Ethernet packet that is smaller than 64 bytes is considered a runt.

Field	Description
giants	Number of packets that are discarded because they exceed the maximum packet size of the medium. For example, any Ethernet packet that is larger than 1536 bytes is considered a giant. **Note** For the 4-Port 10/100 Fast Ethernet SPA, the default is that a giant is any packet greater than 1536 bytes. However, if you modify the maximum transmission unit (MTU) for the interface, this counter increments when you exceed the specified MTU for the interface.
throttles	Number of times the receiver on the port was disabled, possibly because of buffer or processor overload.
input errors	Includes runts, giants, no buffer, cyclic redundancy check (CRC), frame, overrun, and ignored counts. Other input-related errors can also cause the input errors count to be increased, and some datagrams may have more than one error; therefore, this sum may not balance with the sum of enumerated input error counts.
CRC	Cyclic redundancy check generated by the originating LAN station or far-end device does not match the checksum calculated from the data received. On a LAN, this usually indicates noise or transmission problems on the LAN interface or the LAN bus itself. A high number of CRCs is usually the result of collisions or a station transmitting bad data.
frame	Number of packets received incorrectly having a CRC error and a noninteger number of octets. On a LAN, this is usually the result of collisions or a malfunctioning Ethernet device.
overrun	Number of times the receiver hardware was unable to hand received data to a hardware buffer because the input rate exceeded the receiver's ability to handle the data.
ignored	Number of received packets ignored by the interface because the interface hardware ran low on internal buffers. These buffers are different than the system buffers. Broadcast storms and bursts of noise can cause the ignored count to be increased.
watchdog	Number of times the watchdog receive timer expired. Expiration happens when receiving a packet with a length greater than 2048 bytes.
input packets with dribble condition detected	Dribble bit error indicates that a frame is slightly too long. This frame error counter is incremented for informational purposes only; the router accepts the frame.
packets output	Total number of messages transmitted by the system.
bytes	Total number of bytes, including data and MAC encapsulation, transmitted by the system.
underruns	Number of times that the transmitter has been running faster than the router can handle.

Field	Description
output errors	Sum of all errors that prevented the final transmission of datagrams out of the interface being examined. Note that this may not balance with the sum of the enumerated output errors, because some datagrams may have more than one error and others may have errors that do not fall into any of the specifically tabulated categories.
collisions	Number of messages retransmitted because of an Ethernet collision. This is usually the result of an overextended LAN (Ethernet or transceiver cable too long, more than two repeaters between stations, or too many cascaded multiport transceivers). A packet that collides is counted only once in output packets.
interface resets	Number of times an interface has been completely reset. This can happen if packets queued for transmission were not sent within several seconds. Interface resets can occur when an interface is looped back or shut down.
babbles	Transmit jabber timer expired.
late collision	Number of late collisions. Late collision happens when a collision occurs after transmitting the preamble.
deferred	Number of times that the interface had to defer while ready to transmit a frame because the carrier was asserted.
lost carrier	Number of times the carrier was lost during transmission.
no carrier	Number of times the carrier was not present during the transmission. **Note** This field does not apply to SPA interfaces.
output buffer failures, output buffers swapped out	These counters are not used by the 4-Port 10/100 Fast Ethernet SPA on the Cisco 7304 router.

Example with a Gigabit Ethernet SPA on a Cisco 7304 Router

The following is sample output from the **show interfaces gigabitethernet** command for the first interface (port 0) in a 2-Port 10/100/1000 Gigabit Ethernet SPA located in the top subslot (0) of the MSC that is installed in slot 4 on a Cisco 7304 router:

```
Router# show interfaces gigabitethernet 4/0/0

GigabitEthernet4/0/0 is up, line protocol is down
  Hardware is SPA-2GE-7304, address is 00b0.64ff.5a80 (bia 00b0.64ff.5a80)
  MTU 1500 bytes, BW 1000000 Kbit, DLY 10 usec,
     reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation ARPA, loopback not set
  Keepalive set (10 sec)
  Half-duplex, 1000Mb/s, link type is auto, media type is RJ45
  output flow-control is unsupported, input flow-control is unsupported
  ARP type: ARPA, ARP Timeout 04:00:00
  Last input never, output 00:00:09, output hang never
```

```
  Last clearing of "show interface" counters never
  Input queue: 0/75/0/0 (size/max/drops/flushes); Total output drops: 0
  Queueing strategy: fifo
  Output queue: 0/40 (size/max)
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
     0 packets input, 0 bytes, 0 no buffer
     Received 0 broadcasts (0 IP multicast)
     0 runts, 0 giants, 0 throttles
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored
     0 watchdog, 0 multicast, 0 pause input
     109 packets output, 6540 bytes, 0 underruns
     0 output errors, 0 collisions, 2 interface resets
     0 babbles, 0 late collision, 0 deferred
     1 lost carrier, 0 no carrier, 0 PAUSE output
     0 output buffer failures, 0 output buffers swapped out
```

Example with Gigabit Ethernet SPAs Configured as Primary and Backup Interfaces on a Cisco 7600 Router

The following examples show the additional lines included in the display when the command is issued on two Gigabit Ethernet interfaces that are configured as a primary interface (gi3/0/0) and as a backup interface (gi3/0/11) for the primary:

```
Router# show interfaces gigabitEthernet 3/0/0

GigabitEthernet3/0/0 is up, line protocol is up (connected)
  Hardware is GigEther SPA, address is 0005.dc57.8800 (bia 0005.dc57.8800)
  Backup interface GigabitEthernet3/0/11, failure delay 0 sec, secondary disable delay 0
sec,
  .
  .
  .
Router# show interfaces gigabitEthernet 3/0/11

GigabitEthernet3/0/11 is standby mode, line protocol is down (disabled)
  .
  .
  .
```

The table below describes the fields shown in the display for Gigabit Ethernet SPA interfaces.

Table 8: show interfaces gigabitethernet Field Descriptions--Gigabit Ethernet SPA

Field	Description
GigabitEthernet...is up ...is administratively down	Indicates whether the interface hardware is currently active and if it has been taken down by an administrator.
line protocol is	Indicates whether the software processes that handle the line protocol consider the line usable or if it has been taken down by an administrator.
Hardware	Hardware type (for example, SPA-2GE-7304) and MAC address.
Backup interface	Identifies the backup interface that exists for this, the primary interface.

Field	Description
Failure and secondary delay	The period of time (in seconds) to delay bringing up the backup interface when the primary goes down, and bringing down the backup after the primary becomes active again. On the Cisco 7600 router, the delay must be 0 (the default) to ensure that there is no delay between when the primary goes down and the backup comes up, and vice versa.
Standby mode	Indicates that this is a backup interface and that it is currently operating in standby mode.
Description	Alphanumeric string identifying the interface. This appears only if the **description** interface configuration command has been configured on the interface.
Internet address	Internet address followed by subnet mask.
MTU	Maximum transmission unit of the interface. The default is 1500 bytes for the 2-Port 10/100/1000 Gigabit Ethernet SPA.
BW	Bandwidth of the interface in kilobits per second.
DLY	Delay of the interface in microseconds.
reliability	Reliability of the interface as a fraction of 255 (255/255 is 100 percent reliability), calculated as an exponential average over 5 minutes.
txload, rxload	Load on the interface (in the transmit "tx" and receive "rx" directions) as a fraction of 255 (255/255 is completely saturated), calculated as an exponential average over 5 minutes.
Encapsulation	Encapsulation method assigned to the interface.
loopback	Indicates whether loopback is set.
Keepalive	Indicates whether keepalives are set, and the time interval.
Half-duplex, Full-duplex	Indicates the duplex mode for the interface.
1000Mb/s, 100Mb/s, 10Mb/s	Speed of the interface in megabits per second.
link type	Specifies whether autonegotiation is being used on the link.
media type	Interface port media type: RJ45, SX, LX, or ZX.
100BaseTX/FX	Media protocol standard.
ARP type:	Type of ARP assigned and the timeout period.
Last input	Number of hours, minutes, and seconds since the last packet was successfully received by an interface and processed locally on the router. Useful for knowing when a dead interface failed. This field is not updated by fast-switched traffic.

Field	Description
output	Number of hours, minutes, and seconds since the last packet was successfully transmitted by the interface. Useful for knowing when a dead interface failed.
output hang	Number of hours, minutes, and seconds (or never) since the interface was last reset because of a transmission that took too long. When the number of hours in any of the "last" fields exceeds 24 hours, the number of days and hours is displayed. If that field overflows, asterisks are printed. **Note** This field does not apply to SPA interfaces.
Last clearing	Time at which the counters that measure cumulative statistics (such as number of bytes transmitted and received) shown in this report were last reset to zero. Note that variables that might affect routing (for example, load and reliability) are not cleared when the counters are cleared. A series of asterisks (***) indicates the elapsed time is too large to be displayed. 0:00:00 indicates the counters were cleared more than 231 ms (and less than 232 ms) ago.
Input queue (size/max/drops/flushes)	Packet statistics on the input queue reported as: • Size--Number of packets in the input queue. • Max--Maximum size of the queue. • Drops--Number of packets dropped because of a full input queue. • Flushes--Number of packets dropped as part of SPD. SPD implements a selective packet drop policy on the router's IP process queue. Therefore, it applies only to process-switched traffic.
Total output drops	Total number of packets dropped because of a full output queue.
Queueing strategy	Type of Layer 3 queueing active on this interface. The default is FIFO.
Output queue (size/max)	Number of packets in the output queue (size), and the maximum size of the queue (max).
5 minute input rate, 5 minute output rate	Average number of bits and packets transmitted per second in the last 5 minutes. If the interface is not in promiscuous mode, it senses network traffic it sends and receives (rather than all network traffic). The 5-minute input and output rates should be used only as an approximation of traffic per second during a given 5-minute period. These rates are exponentially weighted averages with a time constant of 5 minutes. A period of four time constants must pass before the average will be within two percent of the instantaneous rate of a uniform stream of traffic over that period.
packets input	Total number of error-free packets received by the system.
bytes	Total number of bytes, including data and MAC encapsulation, in the error-free packets received by the system.

Field	Description
Received...broadcasts	Total number of broadcast or multicast packets received by the interface.
runts	Number of packets that are discarded because they are smaller than the minimum packet size of the medium. For instance, any Ethernet packet that is smaller than 64 bytes is considered a runt.
giants	Number of packets that are discarded because they exceed the maximum packet size of the medium. For example, any Ethernet packet that is larger than 1536 bytes is considered a giant. **Note** For the 2-Port 10/100/1000 Gigabit Ethernet SPA, the default is that a giant is any packet greater than 1536 bytes. However, if you modify the MTU for the interface, this counter increments when you exceed the specified MTU for the interface.
throttles	Number of times the receiver on the port was disabled, possibly because of buffer or processor overload.
input errors	Includes runts, giants, no buffer, CRC, frame, overrun, and ignored counts. Other input-related errors can also cause the input errors count to be increased, and some datagrams may have more than one error; therefore, this sum may not balance with the sum of enumerated input error counts.
CRC	Cyclic redundancy check generated by the originating LAN station or far-end device does not match the checksum calculated from the data received. On a LAN, this usually indicates noise or transmission problems on the LAN interface or the LAN bus itself. A high number of CRCs is usually the result of collisions or a station transmitting bad data.
frame	Number of packets received incorrectly having a CRC error and a noninteger number of octets. On a LAN, this is usually the result of collisions or a malfunctioning Ethernet device.
overrun	Number of times the receiver hardware was unable to hand received data to a hardware buffer because the input rate exceeded the receiver's ability to handle the data.
ignored	Number of received packets ignored by the interface because the interface hardware ran low on internal buffers. These buffers are different than the system buffers. Broadcast storms and bursts of noise can cause the ignored count to be increased.
watchdog	Number of times the watchdog receive timer expired. Expiration happens when receiving a packet with a length greater than 2048 bytes.
input packets with dribble condition detected	Dribble bit error indicates that a frame is slightly too long. This frame error counter is incremented for informational purposes only; the router accepts the frame.
packets output	Total number of messages transmitted by the system.

Field	Description
bytes	Total number of bytes, including data and MAC encapsulation, transmitted by the system.
underruns	Number of times that the transmitter has been running faster than the router can handle.
output errors	Sum of all errors that prevented the final transmission of datagrams out of the interface being examined. Note that this may not balance with the sum of the enumerated output errors, because some datagrams may have more than one error and others may have errors that do not fall into any of the specifically tabulated categories.
collisions	Number of messages retransmitted because of an Ethernet collision. This is usually the result of an overextended LAN (Ethernet or transceiver cable too long, more than two repeaters between stations, or too many cascaded multiport transceivers). A packet that collides is counted only once in output packets.
interface resets	Number of times an interface has been completely reset. This can happen if packets queued for transmission were not sent within several seconds. Interface resets can occur when an interface is looped back or shut down.
babbles	Transmit jabber timer expired.
late collision	Number of late collisions. Late collision happens when a collision occurs after transmitting the preamble.
deferred	Number of times that the interface had to defer while ready to transmit a frame because the carrier was asserted.
lost carrier	Number of times the carrier was lost during transmission.
no carrier	Number of times the carrier was not present during the transmission. **Note** This field does not apply to SPA interfaces.
output buffer failures, output buffers swapped out	These counters are not used by the 2-Port 10/100/1000 Gigabit Ethernet SPA on the Cisco 7304 router.

Example with a Packet over SONET/SDH (POS) SPA on a Cisco 7600 Series Router and Catalyst 6500 Series Switch

The following is sample output from the **show interfaces pos** command on a Cisco 7600 series router or Catalyst 6500 series switch for POS interface 4/3/0 (which is the interface for port 0 of the SPA in subslot 3 of the SIP in chassis slot 4):

```
Router# show interfaces pos 4/3/0

POS4/3/0 is up, line protocol is up  (APS working - active)
```

```
Hardware is Packet over SONET
Internet address is 10.0.0.1/8
MTU 4470 bytes, BW 622000 Kbit, DLY 100 usec, rely 255/255, load 1/255
Encapsulation HDLC, crc 16, loopback not set
Keepalive not set
Scramble disabled
Last input 00:00:34, output 04:09:06, output hang never
Last clearing of "show interface" counters never
Queueing strategy:fifo
Output queue 0/40, 0 drops; input queue 0/75, 0 drops
      Available Bandwidth 622000 kilobits/sec
5 minute input rate 0 bits/sec, 0 packets/sec
5 minute output rate 0 bits/sec, 0 packets/sec
   782 packets input, 226563 bytes, 0 no buffer
   Received 0 broadcasts, 1 runts, 0 giants, 0 throttles
            0 parity
   1 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
   271 packets output, 28140 bytes, 0 underruns
   0 output errors, 0 applique, 2 interface resets
   0 output buffer failures, 0 output buffers swapped out
   2 carrier transitions
```

The table below describes the significant fields shown in this display.

Table 9: show interfaces pos Field Descriptions--POS SPA

Field	Description
POS4/3/0 is up, line protocol is up	Indicates whether the interface hardware is currently active and can transmit and receive or whether it has been taken down by an administrator.
Hardware is. . .	Hardware type: • For POSIP--cyBus Packet over SONET • For POS SPAs--Packet over SONET
Internet address is	Internet address and subnet mask.
MTU	Maximum transmission unit of the interface.
BW	Bandwidth of the interface, in kilobits per second.
DLY	Delay of the interface, in microseconds.
rely	Reliability of the interface as a fraction of 255 (255/255 is 100 percent reliability), calculated as an exponential average over 5 minutes.
load	Load on the interface as a fraction of 255 (255/255 is completely saturated), calculated as an exponential average over 5 minutes. The calculation uses the value from the **bandwidth** interface configuration command.
Encapsulation	Encapsulation method assigned to the interface.
Loopback	Indicates whether loopbacks are set.
Keepalive	Indicates whether keepalives are set.

Field	Description
Scramble	Indicates whether SONET payload scrambling is enabled. SONET scrambling is disabled by default. For the POS SPAs on the Cisco 12000 series routers, scrambling is enabled by default.
Last input	Number of hours, minutes, and seconds since the last packet was successfully received by an interface and processed locally on the router. Useful for knowing when a dead interface failed. This counter is updated only when packets are process-switched, not when packets are fast-switched.
(Last) output	Number of hours, minutes, and seconds since the last packet was successfully transmitted by an interface. This counter is updated only when packets are process-switched, not when packets are fast-switched.
(Last) output hang	Number of hours, minutes, and seconds (or never) since the interface was last reset because of a transmission that took too long. When the number of hours in any of the "last" fields exceeds 24 hours, the number of days and hours is printed. If that field overflows, asterisks are printed.
Last clearing	Time at which the counters that measure cumulative statistics (such as number of bytes transmitted and received) shown in this report were last reset to zero. Note that variables that might affect routing (for example, load and reliability) are not cleared when the counters are cleared. *** indicates the elapsed time is too large to be displayed. 0:00:00 indicates the counters were cleared more than 2231 ms (and less than 232 ms) ago.
Queueing strategy	FIFO queueing strategy (other queueing strategies you might see are priority-list, custom-list, and weighted fair).
Output queue, drops input queue, drops	Number of packets in output and input queues. Each number is followed by a slash, the maximum size of the queue, and the number of packets dropped because a queue was full.
5 minute input rate 5 minute output rate	Average number of bits and packets received or transmitted per second in the last 5 minutes.
packets input	Total number of error-free packets received by the system.
bytes (input)	Total number of bytes, including data and MAC encapsulation, in the error-free packets received by the system.
no buffer	Number of received packets discarded because there was no buffer space in the main system. Compare with number of packets ignored. Broadcast storms on Ethernets and bursts of noise on serial lines are often responsible for no input buffer events.
broadcasts	Total number of broadcast or multicast packets received by the interface.
runts	Number of packets that are discarded because they are smaller than the minimum packet size of the medium.

Field	Description
giants	Number of packets that are discarded because they exceed the maximum packet size of the medium.
throttles	Not supported for POS interfaces.
parity	Report of the parity errors on the interface.
input errors	Total number of no buffer, runts, giants, CRCs, frame, overrun, ignored, and abort counts. Other input-related errors can also increment the count, so that this sum might not balance with the other counts.
CRC	Cyclic redundancy checksum generated by the originating LAN station or far-end device does not match the checksum calculated from the data received. On a LAN, this usually indicates noise or transmission problems on the LAN interface or the LAN bus itself. A high number of CRCs is usually the result of collisions or a station transmitting bad data. On a serial link, CRCs usually indicate noise, gain hits, or other transmission problems on the data link.
frame	Number of packets received incorrectly having a CRC error and a noninteger number of octets. On a serial line, this is usually the result of noise or other transmission problems.
overrun	Number of times the serial receiver hardware was unable to hand received data to a hardware buffer because the input rate exceeded the receiver's ability to handle the data.
ignored	Number of received packets ignored by the interface because the interface hardware ran low on internal buffers. These buffers are different than the system buffers mentioned previously in the buffer description. Broadcast storms and bursts of noise can cause the ignored count to be incremented.
abort	Illegal sequence of one bits on the interface.
packets output	Total number of messages transmitted by the system.
bytes (output)	Total number of bytes, including data and MAC encapsulation, transmitted by the system.
underruns	Number of times that the far-end transmitter has been running faster than the near-end router's receiver can handle.
output errors	Sum of all errors that prevented the final transmission of datagrams out of the interface being examined. Note that this might not balance with the sum of the enumerated output errors, because some datagrams can have more than one error, and others can have errors that do not fall into any of the specifically tabulated categories.
applique	Indicates an unrecoverable error has occurred on the POSIP applique. The system then invokes an interface reset.

Field	Description
interface resets	Number of times an interface has been completely reset. This can happen if packets queued for transmission were not sent within a certain interval. If the system notices that the carrier detect line of an interface is up, but the line protocol is down, it periodically resets the interface in an effort to restart it. Interface resets can also occur when an unrecoverable interface processor error occurred, or when an interface is looped back or shut down.
output buffer failures	Not supported for POS interfaces.
output buffers swapped out	Not supported for POS interfaces.
carrier transitions	Number of times the carrier detect signal of the interface has changed state.

Example with a POS SPA on a Cisco 12000 Series Router

The following is sample output from the **show interfaces pos** command on a Cisco 12000 series router for POS interface 1/1/0 (which is the interface for port 0 of the SPA in subslot 1 of the SIP in chassis slot 1):

```
Router# show interfaces pos 1/1/0

POS1/1/0 is up, line protocol is up
  Hardware is Packet over SONET
  Internet address is 10.41.41.2/24
  MTU 4470 bytes, BW 9952000 Kbit, DLY 100 usec, rely 255/255, load 1/255
  Encapsulation HDLC, crc 32, loopback not set
  Keepalive not set
  Scramble enabled
  Last input 00:00:59, output 00:00:11, output hang never
  Last clearing of "show interface" counters 00:00:14
  Queueing strategy: fifo
  Output queue 0/40, 0 drops; input queue 0/75, 0 drops
        Available Bandwidth 9582482 kilobits/sec
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
     0 packets input, 0 bytes, 0 no buffer
     Received 0 broadcasts, 0 runts, 0 giants, 0 throttles
              0 parity
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     1 packets output, 314 bytes, 0 underruns
     0 output errors, 0 applique, 0 interface resets
     0 output buffer failures, 0 output buffers swapped out
     0 carrier transitions
```

Example of Displaying Traffic for a Specific Interface on a Cisco CSR 1000v Series Cloud Services Router

For each interface on the router, the **show interfaces** command displays information about the link. In the following example, for the line starting with `Full Duplex`, the interface port media type is: `Virtual`, not a physical media type such as `RJ45`. This shows that the interface belongs to a cloud

services router (Cisco CSR 1000v Series Cloud Services Router (CSR 1000v) or Cisco Integrated Services Router (ISRv)).

```
Router# show interfaces GigabitEthernet1

GigabitEthernet1 is up, line protocol is up
  Hardware is CSR vNIC, address is 000d.3a16.20f1 (bia 000d.3a16.20f1)
  Internet address is 12.0.0.4/24
  MTU 1500 bytes, BW 1000000 Kbit/sec, DLY 10 usec,
     reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation ARPA, loopback not set
  Keepalive set (10 sec)
  Full Duplex, 1000Mbps, link type is auto, media type is Virtual
```

Example with a POS SPA SDCC Interface on a Cisco 12000 Series Router

The following is sample output from the **show interfaces sdcc**command on a Cisco 12000 series router for POS interface 1/1/0 (which is the interface for port 0 of the SPA in subslot 1 of the SIP in chassis slot 1):

```
Router# show interfaces sdcc 1/1/0

SDCC1/1/0 is administratively down, line protocol is down
  Hardware is SDCC
  MTU 1500 bytes, BW 192 Kbit, DLY 20000 usec, rely 255/255, load 1/255
  Encapsulation HDLC, crc 32, loopback not set
  Keepalive set (10 sec)
  Last input never, output never, output hang never
  Last clearing of "show interface" counters 00:01:55
  Queueing strategy: fifo
  Output queue 0/40, 0 drops; input queue 0/75, 0 drops
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
     0 packets input, 0 bytes, 0 no buffer
     Received 0 broadcasts, 0 runts, 0 giants, 0 throttles
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     0 packets output, 0 bytes, 0 underruns
     0 output errors, 0 collisions, 0 interface resets
     0 output buffer failures, 0 output buffers swapped out
     0 carrier transitions
```

The table below describes the significant fields shown in the display.

Table 10: show interfaces sdcc Field Descriptions--POS SPA

Field	Description
SDCC1/1/0 is administratively down, line protocol is down	Indicates whether the interface hardware is currently active and can transmit and receive or whether it has been taken down by an administrator.
Hardware is. . .	Hardware type is SDCC--Section Data Communications Channel.
Internet address is	Internet address and subnet mask.
MTU	Maximum transmission unit of the interface.

Field	Description
BW	Bandwidth of the interface, in kilobits per second.
DLY	Delay of the interface, in microseconds.
rely	Reliability of the interface as a fraction of 255 (255/255 is 100 percent reliability), calculated as an exponential average over 5 minutes.
load	Load on the interface as a fraction of 255 (255/255 is completely saturated), calculated as an exponential average over 5 minutes. The calculation uses the value from the **bandwidth** interface configuration command.
Encapsulation	Encapsulation method assigned to the interface.
crc	Cyclic redundancy check size (16 or 32 bits).
Loopback	Indicates whether loopback is set.
Keepalive	Indicates whether keepalives are set.
Last input	Number of hours, minutes, and seconds since the last packet was successfully received by an interface and processed locally on the router. Useful for knowing when a dead interface failed. This counter is updated only when packets are process-switched, not when packets are fast-switched.
(Last) output	Number of hours, minutes, and seconds since the last packet was successfully transmitted by an interface. This counter is updated only when packets are process-switched, not when packets are fast-switched.
(Last) output hang	Number of hours, minutes, and seconds (or never) since the interface was last reset because of a transmission that took too long. When the number of hours in any of the "last" fields exceeds 24 hours, the number of days and hours is printed. If that field overflows, asterisks are printed.
Last clearing	Time at which the counters that measure cumulative statistics (such as number of bytes transmitted and received) shown in this report were last reset to zero. Note that variables that might affect routing (for example, load and reliability) are not cleared when the counters are cleared. *** indicates the elapsed time is too large to be displayed. 0:00:00 indicates the counters were cleared more than 2231 ms (and less than 232 ms) ago.
Queueing strategy	FIFO queueing strategy (other queueing strategies you might see are priority-list, custom-list, and weighted fair).
Output queue, drops input queue, drops	Number of packets in output and input queues. Each number is followed by a slash, the maximum size of the queue, and the number of packets dropped because a queue was full.
5 minute input rate 5 minute output rate	Average number of bits and packets received or transmitted per second in the last 5 minutes.

Field	Description
packets input	Total number of error-free packets received by the system.
bytes (input)	Total number of bytes, including data and MAC encapsulation, in the error-free packets received by the system.
no buffer	Number of received packets discarded because there was no buffer space in the main system. Compare with number of packets ignored. Broadcast storms on Ethernets and bursts of noise on serial lines are often responsible for no input buffer events.
broadcasts	Total number of broadcast or multicast packets received by the interface.
runts	Number of packets that are discarded because they are smaller than the minimum packet size of the medium.
giants	Number of packets that are discarded because they exceed the maximum packet size of the medium.
throttles	Not supported for POS interfaces.
parity	Report of the parity errors on the interface.
input errors	Total number of no buffer, runts, giants, CRCs, frame, overrun, ignored, and abort counts. Other input-related errors can also increment the count, so that this sum might not balance with the other counts.
CRC	Cyclic redundancy checksum generated by the originating LAN station or far-end device does not match the checksum calculated from the data received. On a LAN, this usually indicates noise or transmission problems on the LAN interface or the LAN bus itself. A high number of CRCs is usually the result of collisions or a station transmitting bad data. On a serial link, CRCs usually indicate noise, gain hits, or other transmission problems on the data link.
frame	Number of packets received incorrectly having a CRC error and a noninteger number of octets. On a serial line, this is usually the result of noise or other transmission problems.
overrun	Number of times the serial receiver hardware was unable to hand received data to a hardware buffer because the input rate exceeded the receiver's ability to handle the data.
ignored	Number of received packets ignored by the interface because the interface hardware ran low on internal buffers. These buffers are different than the system buffers mentioned previously in the buffer description. Broadcast storms and bursts of noise can cause the ignored count to be incremented.
abort	Illegal sequence of one bits on the interface.
packets output	Total number of messages transmitted by the system.
bytes (output)	Total number of bytes, including data and MAC encapsulation, transmitted by the system.

Field	Description
underruns	Number of times that the far-end transmitter has been running faster than the near-end router's receiver can handle.
output errors	Sum of all errors that prevented the final transmission of datagrams out of the interface being examined. Note that this might not balance with the sum of the enumerated output errors, because some datagrams can have more than one error, and others can have errors that do not fall into any of the specifically tabulated categories.
collisions	Not supported for POS interfaces.
interface resets	Number of times an interface has been completely reset. This can happen if packets queued for transmission were not sent within a certain interval. If the system notices that the carrier detect line of an interface is up, but the line protocol is down, it periodically resets the interface in an effort to restart it. Interface resets can also occur when an unrecoverable interface processor error occurred, or when an interface is looped back or shut down.
output buffer failures	Not supported for POS interfaces.
output buffers swapped out	Not supported for POS interfaces.
carrier transitions	Number of times the carrier detect signal of the interface has changed state.

Example with a T3/E3 Shared Port Adapter

The following example shows the interface serial statistics on the first port of a T3/E3 SPA installed in subslot 0 of the SIP located in chassis slot 5:

```
Router# show interfaces serial 5/0/0
Serial5/0/0 is up, line protocol is up
  Hardware is SPA-4T3E3
  Internet address is 10.1.1.2/24
  MTU 4470 bytes, BW 44210 Kbit, DLY 200 usec,
     reliability 255/255, txload 234/255, rxload 234/255
  Encapsulation HDLC, crc 16, loopback not set
  Keepalive set (10 sec)
  Last input 00:00:05, output 00:00:00, output hang never
  Last clearing of "show interface" counters never
  Input queue: 0/75/0/0 (size/max/drops/flushes); Total output drops: 0
  Queueing strategy: fifo
  Output queue: 0/40 (size/max)
  5 minute input rate 40685000 bits/sec, 115624 packets/sec
  5 minute output rate 40685000 bits/sec, 115627 packets/sec
     4653081241 packets input, 204735493724 bytes, 0 no buffer
     Received 4044 broadcasts (0 IP multicast)
     0 runts, 0 giants, 0 throttles
              0 parity
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     4652915555 packets output, 204728203520 bytes, 0 underruns
     0 output errors, 0 applique, 4 interface resets
     0 output buffer failures, 0 output buffers swapped out
 2 carrier transitions
```

The table below describes the fields shown in the **show interfaces serial** output for a T3/E3 SPA.

Note The fields appearing in the ouput will vary depending on card type, interface configuration, and the status of the interface.

Table 11: show interfaces serial Field Descriptions--T3/E3 SPA

Field	Description
Serial	Name of the serial interface.
line protocol is	If the line protocol is up, the local router has received keepalive packets from the remote router. If the line protocol is down, the local router has not received keepalive packets form the remote router.
Hardware is	Designates the specific hardware type of the interface.
Internet address is	The IP address of the interface.
MTU	The maximum packet size set for the interface.
BW	Bandwidth in kilobits per second.
DLY	Interface delay in microseconds.
reliability	Reliability of the interface as a fraction of 255 (255/255 is 100 percent reliability), calculated as an exponential average over 5 minutes.
txload	Transmit load on the interface as a fraction of 255 (255/255 is completely saturated), calculated as an exponential average over 5 minutes.
rxload	Receive load on the interface as a fraction of 255 (255/255 is completely saturated), calculated as an exponential average over 5 minutes.
Encapsulation	Encapsulation method.
crc	CRC size in bits.
loopback	Indicates whether loopback is set.
keepalive	Indicates whether keepalives are set.
Last input	Number of hours, minutes, and seconds since the last packet was successfully received by an interface and processed locally on the router. Useful for knowing when a dead interface failed. This counter is updated only when packets are process-switched, not when packets are fast-switched.
Last output	Number of hours, minutes, and seconds since the last packet was successfully transmitted by an interface. Useful for knowing when a dead interface failed. This counter is updated only when packets are process-switched, not when packets are fast-switched.

Field	Description
output hang	Number of hours, minutes, and seconds (or never) since the interface was last reset because of a transmission that took too long. When the number of hours in any of the "last" fields exceeds 24 hours, the number of days and hours is printed. If that field overflows, asterisks are printed.
Last clearing of show interface counters	Time at which the counters that measure cumulative statistics (such as number of bytes transmitted and received) shown in this report were last reset to zero. Note that variables that might affect routing (for example, load and reliability) are not cleared when the counters are cleared. *** indicates the elapsed time is too large to be displayed. 0:00:00 indicates the counters were cleared more than 231 milliseconds (and less than 232 ms) ago.
Input queue	Packet statistics on the input queue reported as: • Size--Current size of the input queue. • Max--Maximum size of the input queue. • Drops--Packets dropped because the queue was full. • Flushes--Number of times that data on queue has been discarded.
Total output drops	Total number of dropped packets.
Queueing strategy	FIFO queueing strategy (other queueing strategies you might see are priority-list, custom-list, and weighted fair).
Output queue	Number of packets in the output queue (size), and the maximum size of the queue (max).
5-minute input rate	Average number of bits and packets received per second in the last 5 minutes. If the interface is not in promiscuous mode, it senses network traffic it sends and receives (rather than all network traffic). The 5-minute input and output rates should be used only as an approximation of traffic per second during a given 5-minute period. These rates are exponentially weighted averages with a time constant of 5 minutes. A period of four time constants must pass before the average will be within two percent of the instantaneous rate of a uniform stream of traffic over that period.
5-minute output rate	Average number of bits and packets transmitted per second in the last 5 minutes. If the interface is not in promiscuous mode, it senses network traffic it sends and receives (rather than all network traffic). The 5-minute input and output rates should be used only as an approximation of traffic per second during a given 5-minute period. These rates are exponentially weighted averages with a time constant of 5 minutes. A period of four time constants must pass before the average will be within two percent of the instantaneous rate of a uniform stream of traffic over that period.

Example with a 1-Port 10-Gigabit Ethernet SPA on a Cisco 12000 Series Router

The following is sample output from the **show interfaces tengigabitethernet** command for the only interface (port 0) in a 1-Port 10 Gigabit Ethernet SPA located in the top subslot (0) of the carrier card that is installed in slot 7 on a Cisco 12000 series router:

```
Router# show interfaces tengigabitethernet 7/0/0
TenGigabitEthernet7/0/0 is up, line protocol is up (connected)
  Hardware is TenGigEther SPA, address is 0000.0c00.0102 (bia 000f.342f.c340)
  Internet address is 10.1.1.2/24
  MTU 1500 bytes, BW 10000000 Kbit, DLY 10 usec,
     reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation ARPA, loopback not set
  Keepalive not supported
  Full-duplex, 10Gb/s
  input flow-control is on, output flow-control is on
ARP type: ARPA, ARP Timeout 04:00:00
  Last input never, output 00:00:10, output hang never
  Last clearing of "show interface" counters 20:24:30
  Input queue: 0/75/0/0 (size/max/drops/flushes); Total output drops: 0
  Queueing strategy: fifo
  Output queue: 0/40 (size/max)
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
  L2 Switched: ucast: 0 pkt, 0 bytes - mcast: 0 pkt, 0 bytes
  L3 in Switched: ucast: 0 pkt, 0 bytes - mcast: 0 pkt, 0 bytes mcast
  L3 out Switched: ucast: 0 pkt, 0 bytes mcast: 0 pkt, 0 bytes
     237450882 packets input, 15340005588 bytes, 0 no buffer
     Received 25 broadcasts (0 IP multicasts)
     0 runts, 0 giants, 0 throttles
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored
     0 watchdog, 0 multicast, 0 pause input
     0 input packets with dribble condition detected
     1676 packets output, 198290 bytes, 0 underruns
     0 output errors, 0 collisions, 4 interface resets
     0 babbles, 0 late collision, 0 deferred
     0 lost carrier, 0 no carrier, 0 PAUSE output
     0 output buffer failures, 0 output buffers swapped out
```

The table below describes the significant fields shown in the display.

Table 12: show interfaces tengigabitethernet Field Descriptions--10-Gigabit Ethernet SPA

Field	Description
TenGigabitEthernet...is up ...is administratively down	Indicates whether the interface hardware is currently active and if it has been taken down by an administrator.
line protocol is	Indicates whether the software processes that handle the line protocol consider the line usable or if it has been taken down by an administrator.
Hardware	Hardware type and MAC address.
Description	Alphanumeric string identifying the interface. This appears only if the **description** interface configuration command has been configured on the interface.
Internet address	Internet address followed by subnet mask.

Field	Description
MTU	Maximum transmission unit of the interface.
BW	Bandwidth of the interface in kilobits per second.
DLY	Delay of the interface in microseconds.
reliability	Reliability of the interface as a fraction of 255 (255/255 is 100 percent reliability), calculated as an exponential average over 5 minutes.
txload, rxload	Load on the interface (in the transmit “tx” and receive “rx” directions) as a fraction of 255 (255/255 is completely saturated), calculated as an exponential average over 5 minutes.
Encapsulation	Encapsulation method assigned to the interface.
loopback	Indicates whether loopback is set.
Keepalive	Indicates whether keepalives are set, and the time interval.
Half-duplex, Full-duplex	Indicates the duplex mode for the interface.
10Gb/s	Speed of the interface in Gigabits per second.
input flow control ...	Specifies if input flow control is on or off.
ARP type:	Type of ARP assigned and the timeout period.
Last input	Number of hours, minutes, and seconds since the last packet was successfully received by an interface and processed locally on the router. Useful for knowing when a dead interface failed. This field is not updated by fast-switched traffic.
output	Number of hours, minutes, and seconds since the last packet was successfully transmitted by the interface. Useful for knowing when a dead interface failed.
output hang	Number of hours, minutes, and seconds (or never) since the interface was last reset because of a transmission that took too long. When the number of hours in any of the “last” fields exceeds 24 hours, the number of days and hours is displayed. If that field overflows, asterisks are printed.
Last clearing	Time at which the counters that measure cumulative statistics (such as number of bytes transmitted and received) shown in this report were last reset to zero. Note that variables that might affect routing (for example, load and reliability) are not cleared when the counters are cleared. A series of asterisks (***) indicates the elapsed time is too large to be displayed. 0:00:00 indicates the counters were cleared more than 231 ms (and less than 232 ms) ago.

Field	Description
Input queue (size/max/drops/flushes)	Packet statistics on the input queue reported as: • Size--Number of packets in the input queue. • Max--Maximum size of the queue. • Drops--Number of packets dropped because of a full input queue. • Flushes--Number of packets dropped as part of SPD. SPD implements a selective packet drop policy on the router's IP process queue. Therefore, it applies only to process-switched traffic.
Total output drops	Total number of packets dropped because of a full output queue.
Queueing strategy	Type of Layer 3 queueing active on this interface. The default is FIFO.
Output queue (size/max)	Number of packets in the output queue (size), and the maximum size of the queue (max).
5 minute input rate, 5 minute output rate	Average number of bits and packets transmitted per second in the last 5 minutes. If the interface is not in promiscuous mode, it senses network traffic it sends and receives (rather than all network traffic). The 5-minute input and output rates should be used only as an approximation of traffic per second during a given 5-minute period. These rates are exponentially weighted averages with a time constant of 5 minutes. A period of four time constants must pass before the average will be within two percent of the instantaneous rate of a uniform stream of traffic over that period.
L2 Switched	Provides statistics about Layer 2 switched traffic, including unicast and multicast traffic.
L3 in Switched	Provides statistics about received Layer 3 traffic.
L3 out Switched	Provides statistics about sent Layer 3 traffic.
packets input	Total number of error-free packets received by the system.
bytes	Total number of bytes, including data and MAC encapsulation, in the error-free packets received by the system.
Received...broadcasts	Total number of broadcast or multicast packets received by the interface.
runts	Number of packets that are discarded because they are smaller than the minimum packet size of the medium.
giants	Number of packets that are discarded because they exceed the maximum packet size of the medium.
throttles	Number of times the receiver on the port was disabled, possibly because of buffer or processor overload.

Field	Description
input errors	Includes runts, giants, no buffer, CRC, frame, overrun, and ignored counts. Other input-related errors can also cause the input errors count to be increased, and some datagrams may have more than one error; therefore, this sum may not balance with the sum of enumerated input error counts.
CRC	Cyclic redundancy check generated by the originating LAN station or far-end device does not match the checksum calculated from the data received. On a LAN, this usually indicates noise or transmission problems on the LAN interface or the LAN bus itself. A high number of CRCs is usually the result of collisions or a station transmitting bad data.
frame	Number of packets received incorrectly having a CRC error and a noninteger number of octets. On a LAN, this is usually the result of collisions or a malfunctioning Ethernet device.
overrun	Number of times the receiver hardware was unable to hand received data to a hardware buffer because the input rate exceeded the receiver's ability to handle the data.
ignored	Number of received packets ignored by the interface because the interface hardware ran low on internal buffers. These buffers are different than the system buffers. Broadcast storms and bursts of noise can cause the ignored count to be increased.
watchdog	Number of times the watchdog receive timer expired.
multicast	Number of multicast packets.
pause input	Number of pause packets received.
input packets with dribble condition detected	Dribble bit error indicates that a frame is slightly too long. This frame error counter is incremented for informational purposes only; the router accepts the frame.
packets output	Total number of messages transmitted by the system.
bytes	Total number of bytes, including data and MAC encapsulation, transmitted by the system.
underruns	Number of times that the transmitter has been running faster than the router can handle.
output errors	Sum of all errors that prevented the final transmission of datagrams out of the interface being examined. Note that this may not balance with the sum of the enumerated output errors, because some datagrams may have more than one error and others may have errors that do not fall into any of the specifically tabulated categories.
collisions	Number of messages retransmitted because of an Ethernet collision. This is usually the result of an overextended LAN (Ethernet or transceiver cable too long, more than two repeaters between stations, or too many cascaded multiport transceivers). A packet that collides is counted only once in output packets.

Field	Description
interface resets	Number of times an interface has been completely reset. This can happen if packets queued for transmission were not sent within several seconds. Interface resets can occur when an interface is looped back or shut down.
babbles	Transmit jabber timer expired.
late collision	Number of late collisions. Late collision happens when a collision occurs after transmitting the preamble.
deferred	Number of times that the interface had to defer while ready to transmit a frame because the carrier was asserted.
lost carrier	Number of times the carrier was lost during transmission.
no carrier	Number of times the carrier was not present during the transmission.
pause output	Number of pause packets transmitted.
output buffer failures, output buffers swapped out	Number of output butters failures and output buffers swapped out.

Displaying Traffic for a Specific Interface Example

This example shows how to display traffic for a specific interface:

```
Router# show interfaces GigabitEthernet1/1

GigabitEthernet0/1 is up, line protocol is up
  Hardware is BCM1125 Internal MAC, address is 0016.9de5.d9d1 (bia 0016.9de5.d9d1)
  Internet address is 172.16.165.40/27
  MTU 1500 bytes, BW 100000 Kbit/sec, DLY 100 usec,
     reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation ARPA, loopback not set
  Keepalive set (10 sec)
  Full-duplex, 100Mb/s, media type is RJ45
  output flow-control is XON, input flow-control is XON
  ARP type: ARPA, ARP Timeout 04:00:00
  Last input 00:00:11, output 00:00:08, output hang never
  Last clearing of "show interface" counters never
  Input queue: 0/75/0/0 (size/max/drops/flushes); Total output drops: 0
  Queueing strategy: fifo
  Output queue: 0/40 (size/max)
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
     10 packets input, 2537 bytes, 0 no buffer
     Received 10 broadcasts, 0 runts, 0 giants, 0 throttles
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored
     0 watchdog, 46 multicast, 0 pause input
     0 input packets with dribble condition detected
     18 packets output, 3412 bytes, 0 underruns
     0 output errors, 0 collisions, 1 interface resets
     7 unknown protocol drops
     0 babbles, 0 late collision, 0 deferred
     2 lost carrier, 0 no carrier, 0 pause output
     0 output buffer failures, 0 output buffers swapped out
```

Note The unknown protocol drops field displayed in the above example refers to the total number of packets dropped due to unknown or unsupported types of protocol. This field occurs on several platforms such as the Cisco 3725, 3745, 3825, and 7507 series routers.

This example shows how to display traffic for a FlexWAN module:

```
Router# show interfaces pos 6/1/0.1

POS6/1/0.1 is up, line protocol is up
  Hardware is Packet over Sonet
  Internet address is 10.1.2.2/24
  MTU 4470 bytes, BW 155000 Kbit, DLY 100 usec,
     reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation FRAME-RELAY <<<+++ no packets info after this line
Arches#sh mod 6
Mod Ports Card Type                                Model              Serial No.
--- ----- ---------------------------------------- ------------------ -----------
  6    0  2 port adapter FlexWAN                   WS-X6182-2PA       SAD04340JY3
Mod MAC addresses                       Hw    Fw           Sw           Status
--- ----------------------------------- ------ ------------ ------------ -------
  6  0001.6412.a234 to 0001.6412.a273   1.3   12.2(2004022 12.2(2004022 Ok
Mod Online Diag Status
--- -------------------
  6 Pass
Router#
```

Related Commands

Command	Description
fair-queue	Enables WFQ.
interface	Configures an interface type and enters interface configuration mode.
show controllers fastethernet	Displays Fast Ethernet interface information, transmission statistics and errors, and applicable MAC destination address and VLAN filtering tables.
show controllers gigabitethernet	Displays Gigabit Ethernet interface information, transmission statistics and errors, and applicable MAC destination address and VLAN filtering tables.
show controllers pos	Displays information about the POS controllers.
show controllers serial	Displays controller statistics.

show interfaces accounting

To display the number of packets of each protocol type that have been sent through all configured interfaces, use the **showinterfacesaccounting** command in user EXEC or privileged EXEC mode.

show interfaces [*interface type number* | **null** *interface-number* | **vlan** *vlan-id*] **accounting**

Syntax Description

interface	(Optional) Interface type; possible valid values are **ethernet**, **fastethernet**, **gigabitethernet**, **tengigabitethernet**, **pos**, and **port-channel**, **atm**, and **ge-wan**.
type number	(Optional) Module and port number; see the "Usage Guidelines" section for valid values.
null *interface-number*	(Optional) Specifies the null interface; the valid value is **0**.
vlan *vlan-id*	(Optional) Specifies the VLAN ID; valid values are from 1 to 4094.

Command Modes

User EXEC

Privileged EXEC (#)

Command History

Release	Modification
12.2(17a)SX1	This command was introduced on the Supervisor Engine 720.
12.2(17d)SXB	Support for this command on the Supervisor Engine 2 was extended to Release 12.2(17d)SXB.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(33)SRC	Support for IPv6 was added.
12.2(33)SB	This command was integrated into Cisco IOS Release 12.2(33)SB.
Cisco IOS XE Release 2.1	This command was integrated into Cisco IOS XE Release 2.1.
15.4(2)S	This command was integrated into Cisco IOS Release 15.4(2)S.

Usage Guidelines

Note The Pkts Out and Chars Out fields display IPv6 packet counts only. The Pkts In and Chars In fields display both IPv4 and IPv6 packet counts, except for tunnel interfaces. For tunnel interfaces, the IPv6 input packets are counted as IPv6 packets only.

Due to hardware limitations on the ASIC, PFC IPv4 and IPv6 packets cannot be differentiated in the Pkts In and Chars In fields for IP count the IPv6 and IPv4 packets that are hardware forwarded. The Pkts In and Chars In fields for IPv6 only count software-forwarded packets. The IP Pkts Out and Chars Out fields show IPv4 packets, and the IPv6 Pkts Out and Chars Out fields show IPv6 packets.

The *interface-number* argument designates the module and port number. Valid values for *interface-number* depend on the specified interface type and the chassis and module that are used. For example, if you specify a Gigabit Ethernet interface and have a 48-port 10/100BASE-T Ethernet module that is installed in a 13-slot chassis, valid values for the module number are from 1 to 13 and valid values for the port number are from 1 to 48.

The port channels from 257 to 282 are internally allocated and are supported on the CSM and the FWSM only.

If you do not enter any keywords, all counters for all modules are displayed.

Examples

This example shows how to display the number of packets of each protocol type that have been sent through all configured interfaces:

```
Device# show interfaces gigabitethernet 5/2 accounting

GigabitEthernet5/2
Protocol Pkts In Chars In Pkts Out Chars Out
IP       50521   50521000 0        0
DEC MOP  0       0        1        129
CDP      0       0        1        592
IPv6     11      834      96       131658
```

The table below describes the significant fields shown in the display.

Table 13: show interfaces accounting Command Output Fields

Field	Description
Protocol	Protocol that is operating on the interface.
Pkts In	For IP it is the number of IPv4 software switched, IPv4 and IPv6 hardware switched packets received for the specified protocol. For IPv6 it is the number of IPv6 software switched packets received for the specified protocol.
Chars In	For IP it is the number of IPv4 software switched, IPv4 and IPv6 hardware switched characters received for the specified protocol. For IPv6 it is the number of IPv6 software switched characters received for the specified protocol.
Pkts Out	For IP it is the number of IPv4 sofware and hardware switched packets transmitted for the specified protocol. For IPv6 it is the number of IPv6 sofware and hardware switched packets transmitted for the specified protocol.
Chars Out	For IP it is the number of IPv4 software and hardware switched characters transmitted for the specified protocol. For IPv6 it is the number of IPv6 software and hardware switched characters transmitted for the specified protocol.

Related Commands

Command	Description
show interfaces	Displays the status and statistics for the interfaces in the chassis.

show interfaces analysis-module

To display status, traffic data, and configuration information about the analysis module interface, use the **showinterfacesanalysis-module** command in user EXEC or privileged EXEC mode.

show interfaces analysis-module *slot/unit*

Syntax Description

slot	Number of the router chassis slot for the network module.
/ *unit*	Number of the daughter card on the network analysis module (NAM). For NAM, always use 0.

Command Modes

User EXEC Privileged EXEC

Command History

Release	Modification
12.3(4)XD	This command was introduced on the following platforms: Cisco 2600XM series, Cisco 2691, Cisco 3660, Cisco 3725, and Cisco 3745.
12.3(7)T	This command was integrated into Cisco IOS Release 12.3(7)T.
12.3(8)T4	This command was implemented on the following platforms: Cisco 2811, Cisco 2821, and Cisco 2851.
12.3(11)T	This command was implemented on the Cisco 3800 series.

Usage Guidelines

The analysis module interface is a Fast Ethernet interface on the router that connects to the internal interface on the Network Analysis Module (NM-NAM).

Examples

The command in the following example displays status, traffic data, and configuration information about the analysis module interface when the NM-NAM is installed in slot 2 of a Cisco 3745.

```
Router# show interfaces analysis-module 2/0

Network-Analyzer2/0 is up, line protocol is up
  Hardware is I82559FE, address is 0001.a535.0920 (bia 0001.a535.0920)
  Internet address is 10.1.1.1/24
  MTU 1500 bytes, BW 100000 Kbit, DLY 100 usec,
     reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation ARPA, loopback not set
  Keepalive set (10 sec)
  ARP type: ARPA, ARP Timeout 04:00:00
  Last input 00:00:26, output 00:00:00, output hang never
  Last clearing of "show interface" counters never
  Input queue: 0/75/0/0 (size/max/drops/flushes); Total output drops: 4682
  Queueing strategy: fifo
  Output queue: 0/60 (size/max)
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 36000 bits/sec, 22 packets/sec
     905 packets input, 38190 bytes, 0 no buffer
     Received 0 broadcasts, 0 runts, 0 giants, 0 throttles
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored
     0 input packets with dribble condition detected
     671863 packets output, 96101624 bytes, 0 underruns
```

```
0 output errors, 0 collisions, 1 interface resets
     0 babbles, 0 late collision, 0 deferred
     0 lost carrier, 0 no carrier
     0 output buffer failures, 0 output buffers swapped out
```

The table below describes the significant fields shown in the display.

Table 14: show interfaces analysis-module Field Descriptions

Field	Description
Network-Analyzer	Indicates whether the analysis module interface hardware is currently active. The analysis module interface is the router-side interface for the internal Ethernet segment between the router and the NAM network module. If the analysis module interface hardware is operational, the output states that the "Network-Analyzer 1/0 is up." If the interface has been taken down by an administrator, the output states that the "Network-Analyzer 1/0 is administratively down."
line protocol is	Indicates whether the software processes that handle the line protocol consider the line usable or whether the line has been taken down by an administrator.
Hardware is...address is	Hardware type and address.
MTU	Maximum transmission unit (MTU) of the analysis module interface.
BW	Bandwidth of the interface, in kbps.
DLY	Delay of the interface, in microseconds.
reliability	Reliability of the interface as a fraction of 255 (255/255 is 100 percent reliability), calculated as an exponential average over 5 minutes.
txload	Transmit load on the interface as a fraction of 255 (255/255 is completely saturated), calculated as an exponential average over 5 minutes.
rxload	Receive load on the interface as a fraction of 255 (255/255 is completely saturated), calculated as an exponential average over 5 minutes.
Encapsulation	Encapsulation method assigned to the interface.
loopback	Indicates whether or not loopback is set.
Keepalive	Indicates whether or not keepalives are set and the interval between keepalives if they have been set.
ARP type...ARP Timeout	Type of Address Resolution Protocol (ARP) assigned and length of timeout.
Last input	Number of hours, minutes, and seconds since the last packet was successfully received by the interface and processed locally on the router. This field is useful for detecting when a dead interface failed. **Note** This field is not updated by fast-switched traffic.

Field	Description
output	Number of hours, minutes, and seconds since the last packet was successfully transmitted by the interface. This field is useful for detecting when a dead interface failed.
output hang	Number of hours, minutes, and seconds (or never) since the interface was last reset because a transmission took too long. When the number of hours in any of the "last" fields exceeds 24 hours, the number of days and hours is printed. If that field overflows, asterisks are printed.
Last clearing	Time at which the counters that measure cumulative statistics (such as number of bytes transmitted and received) shown in this report were last reset to zero. Note that variables that might affect routing (for example, load and reliability) are not cleared when the counters are cleared. Asterisks (***) indicate that the elapsed time is too large to be displayed.
Input queue	Number of packets in the input queue. Each number is followed by a slash, the maximum size of the queue, the number of packets dropped because of a full queue, and the number of times that queued packets have been discarded.
Total output drops	Number of packets in the output queue that have been dropped because of a full queue.
Queueing strategy	Queueing strategy applied to the interface, which is configurable under the interface. The default is FIFO (first-in, first-out).
Output queue	Number of packets in the output queue, and the maximum size of the queue. Each number is followed by a slash.
5 minute input rate, 5 minute output rate	Average number of bits and packets transmitted per second in the last 5 minutes. If the interface is not in promiscuous mode, it senses network traffic that it sends and receives (rather than all network traffic). The 5-minute input and output rates should be used only as an approximation of traffic per second during a given 5-minute period. These rates are exponentially weighted averages with a time constant of 5 minutes. A period of four time constants must pass before the average will be within 2 percent of the instantaneous rate of a uniform stream of traffic over that period. **Note** The 5-minute period referenced in this output is a load interval that is configurable under the interface. The default value is 5 minutes.
packets input	Total number of error-free packets received by the system.
bytes	Total number of bytes, including data and MAC encapsulation, in the error-free packets received by the system.
no buffer	Number of received packets discarded because there was no buffer space in the main system. Compare with ignored count. Broadcast storms on Ethernets and bursts of noise on serial lines are often responsible for no input buffer events.

Field	Description
Received...broadcasts	Number of broadcasts received.
runts	Number of packets that are discarded because they are smaller than the minimum packet size of the medium. For instance, any Ethernet packet that is less than 64 bytes is considered a runt.
giants	Number of packets that are discarded because they exceed the maximum packet size of the medium. For example, any Ethernet packet that is greater than 1518 bytes is considered a giant.
throttles	Number of times that the interface requested another interface within the router to slow down.
input errors	Errors that include runts, giants, no buffer, cyclic redundancy checksum (CRC), frame, overrun, and ignored counts. Other input-related errors can also cause the input errors count to be increased, and some datagrams may have more than one error; therefore, this sum may not balance with the sum of enumerated input error counts.
CRC	Errors created when the CRC generated by the originating LAN station or far-end device does not match the checksum calculated from the data received. On a LAN, this usually indicates noise or transmission problems on the LAN interface or the LAN bus itself. A high number of CRCs is usually the result of collisions or a station that is transmitting bad data.
frame	Number of packets received incorrectly that have a CRC error and a noninteger number of octets. On a LAN, this is usually the result of collisions or a malfunctioning Ethernet device.
overrun	Number of times that the receiver hardware was unable to hand received data to a hardware buffer because the input rate exceeded the receiver's ability to handle the data.
ignored	Number of received packets that were ignored by the interface because the interface hardware ran low on internal buffers. These buffers are different from system buffer space described. Broadcast storms and bursts of noise can cause the ignored count to increase.
input packets with dribble condition detected	Number of packets with dribble condition. Dribble bit error indicates that a frame is slightly too long. This frame error counter is incremented just for informational purposes; the router accepts the frame.
packets output	Total number of messages that have been transmitted by the system.
bytes	Total number of bytes, including data and MAC encapsulation, that have been transmitted by the system.
underruns	Number of times that the transmitter has run faster than the router could handle. This may never be reported on some interfaces.

Field	Description
output errors	Sum of all errors that prevented the final transmission of datagrams out of the interface that is being examined. Note that this may not balance with the sum of the enumerated output errors, because some datagrams may have more than one error, and others may have errors that do not fall into any of the specifically tabulated categories.
collisions	Number of messages that have been retransmitted because of an Ethernet collision. This is usually the result of an overextended LAN (Ethernet or transceiver cable too long, more than two repeaters between stations, or too many cascaded multiport transceivers). A packet that collides is counted only once in output packets.
interface resets	Number of times an interface has been completely reset. This can happen if packets that were queued for transmission were not sent within several seconds. On a serial line, this can be caused by a malfunctioning modem that is not supplying the transmit clock signal or by a cable problem. If the system notices that the carrier detect line of a serial interface is up, but the line protocol is down, it periodically resets the interface in an effort to restart it. Interface resets can also occur when an interface is looped back or shut down.
babbles	Count of frames greater than 1518 bytes that have been transmitted, indicating that the transmitter has been on the interface longer than the time necessary to transmit the largest frame.
late collision	Number of late collisions. A collision becomes a late collision when it occurs after the preamble has been transmitted.
deferred	Deferred indicates that the chip, while ready to transmit a frame, had to defer because the carrier was asserted.
lost carrier	Number of times that the carrier was lost during transmission.
no carrier	Number of times that the carrier was not present during the transmission.
output buffer failures, output buffers swapped out	Number of failed buffers and number of buffers swapped out.

Related Commands

Command	Description
show controllers analysis-module	Displays controller information for the analysis module interface.

show interfaces bdi

To display statistics for bridge domain interfaces (BDI) configured on the router, use the **show interfaces** command in privileged EXEC mode.

show interfaces [*type number*]

Syntax Description

number	(Optional) Port number on the selected interface.
accounting	(Optional) Displays the number of packets of each protocol type that have been sent through the interface.
controller	(Optional) Displays the interface status, configuration and controller status.
counters	(Optional) Displays the current status of the protocol counters enabled.
crb	(Optional) Displays interface routing or bridging information.
dampening	(Optional) Displays interface dampening information.
description	(Optional) Displays the interface description.
etherchannel	(Optional) Displays interface Ether Channel information.
history	(Optional) Displays the interface history.
irb	(Optional) Displays interface routing or bridging information.
mac-accounting	(Optional) Displays interface MAC accounting information.
mpls-exp	(Optional) Displays interface Multiprotocol Label Switching (MPLS) experimental accounting information.
precedence	(Optional) Displays interface precedence accounting information.
random-detect	(Optional) Displays interface Weighted Random Early Detection (WRED) information.
rate-limit	(Optional) Displays interface rate-limit information.
stats	(Optional) Displays interface packets and octets, in and out, by using switching path.
summary	(Optional) Displays an interface summary.

Command Default

This command has no default settings.

Command Modes

User EXEC (>)
Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Release 3.2S	This command was introduced on Cisco ASR 1000 Series Aggregation Services Routers.

Examples

The following example shows BDI configuration output:

```
Router# show interfaces BDI3
asr2#sh int bdi3
BDI3 is up, line protocol is up
Hardware is BDI, address is cafe.aaaa.0003 (bia 0024.14ab.86bf)
Internet address is 197.1.3.12/24
MTU 1500 bytes, BW 1000000 Kbit/sec, DLY 10 usec,
reliability 255/255, txload 8/255, rxload 8/255
Encapsulation QinQ VLAN, outer ID  1, inner ID 2, loopback not set
Keepalive not supported
ARP type: ARPA, ARP Timeout 04:00:00
Last input 00:19:15, output 00:03:59, output hang never
Last clearing of "show interface" counters 00:17:36
Input queue: 0/375/0/0 (size/max/drops/flushes); Total output drops: 0
Queueing strategy: fifo
Output queue: 0/40 (size/max)
5 minute input rate 32947000 bits/sec, 73545 packets/sec
5 minute output rate 32877000 bits/sec, 73391 packets/sec
78126222 packets input, 4375068432 bytes, 0 no buffer
Received 0 broadcasts (0 IP multicasts)
0 runts, 0 giants, 0 throttles
0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored
78126268 packets output, 4375071092 bytes, 0 underruns
0 output errors, 0 interface resets
0 unknown protocol drops
.
.
```

The following example shows the BDI interface summary:

```
Router#show interfaces bdi 3 summary
 *: interface is up
 IHQ: pkts in input hold queue     IQD: pkts dropped from input queue
 OHQ: pkts in output hold queue    OQD: pkts dropped from output queue
 RXBS: rx rate (bits/sec)          RXPS: rx rate (pkts/sec)
 TXBS: tx rate (bits/sec)          TXPS: tx rate (pkts/sec)
 TRTL: throttle count
  Interface                   IHQ        IQD       OHQ        OQD      RXBS      L
------------------------------------------------------------------------------------
  BDI3                          0          0         0          0         0      0
```

show interfaces capabilities

To display the interface capabilities for a module, an interface, or all interfaces, use the **showinterfacescapabilities** command in user EXEC or privileged EXEC mode.

show interfaces [*interface interface-number*] **capabilities** [**module** *number*]

Syntax Description

interface	(Optional) Interface type; possible valid values are **ethernet**, **fastethernet**, **gigabitethernet**, **tengigabitethernet**, **pos**, **atm**, and **port-channel**, and **ge-wan**.
interface-number	Module and port number; see the "Usage Guidelines" section for valid values.
module *number*	(Optional) Specifies the module number; see the "Usage Guidelines" section for valid values.

Command Default

This command has no default settings.

Command Modes

User EXEC Privileged EXEC

Command History

Release	Modification
12.2(14)SX	Support for this command was introduced on the Supervisor Engine 720.
12.2(17d)SXB	Support for this command on the Supervisor Engine 2 was extended to Release 12.2(17d)SXB.
12.2(18)SXE	This output was changed to include information about the following on the Supervisor Engine 720 only: • Port security • dot1x
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

Usage Guidelines

The **pos**, **atm**, and **ge-wan** keywords are supported on Cisco 7600 series routers that are configured with a Supervisor Engine 2

The *interface-number*argument designates the module and port number. Valid values for *interface-number* depend on the chassis and module that are used. For example, if you have a 48-port 10/100BASE-T Ethernet module that is installed in a 13-slot chassis, valid values for the slot number are from 2 to 13 and valid values for the port number are from 1 to 48.

The **port-channel** values are from 0 to 282; values from 257 to 282 are supported on the CSM and the FWSM only.

Examples

This example shows how to display the interface capabilities for a module:

```
Router> show interfaces capabilities module 6
FastEthernet6/1
Dot1x: yes
Model: WS-X6248-RJ-45
```

```
Type: 10/100BaseTX
Speed: 10,100,auto
Duplex: half,full
Trunk encap. type: 802.1Q,ISL
Trunk mode: on,off,desirable,nonegotiate
Channel: yes
Broadcast suppression: percentage(0-100)
Flowcontrol: rx-(off,on),tx-(none)
Membership: static
Fast Start: yes
QOS scheduling: rx-(1q4t), tx-(2q2t)
CoS rewrite: yes
ToS rewrite: yes
Inline power: no
SPAN: source/destination
UDLD yes
Link Debounce: yes
Link Debounce Time: no
Ports on ASIC: 1-12
Port-Security: yes
Router#
```

This example shows how to display the interface capabilities for an interface:

```
Router? show interfaces fastethernet 4/1 capabilities
FastEthernet4/1
Model: WS-X6348-RJ-45
Type: 10/100BaseTX
Speed: 10,100,auto
Duplex: half,full
Trunk encap. type: 802.1Q,ISL
Trunk mode: on,off,desirable,nonegotiate
Channel: yes
Broadcast suppression: percentage(0-100)
Flowcontrol: rx-(off,on),tx-(none)
Fast Start: yes
QOS scheduling: rx-(1q4t), tx-(2q2t)
CoS rewrite: yes
ToS rewrite: yes
Inline power: no
SPAN: source/destination
```

This example shows how to display the port-channel interface capabilities:

```
Router> show interfaces port-channel 12 capabilities
Port-channel12
  Model:                 NO IDPROM
  Type:                  unknown
  Speed:                 10,100,1000,auto
  Duplex:                half,full
  Trunk encap. type:     802.1Q,ISL
  Trunk mode:            on,off,desirable,nonegotiate
  Channel:               yes
  Broadcast suppression: percentage(0-100)
  Flowcontrol:           rx-(off,on),tx-(none)
  Fast Start:            yes
  QOS scheduling:        rx-(1q4t), tx-(1q4t)
  CoS rewrite:           yes
  ToS rewrite:           yes
  Inline power:          no
  SPAN:                  source/destination
```

Router#

Related Commands

Command	Description
show interfaces	Displays the status and statistics for the interfaces in the chassis.

show interfaces content-engine

To display basic interface configuration information for a content engine (CE) network module, use the **showinterfacescontent-engine** command in privileged EXEC mode.

show interfaces content-engine *slot/unit*

Syntax Description

slot	Number of the router chassis slot for the network module.
unit	Number of the daughter card on the network module. For CE network modules, always use 0.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.2(11)YT	This command was introduced.
12.2(13)T	This command was integrated into Cisco IOS Release 12.2(13)T.

Usage Guidelines

The output for this command contains the basic configuration for the interface, as well as the number of packets transmitted, output rate, and so forth.

Examples

The following example displays interface status and data for the CE network module in slot 1 for Cisco 2600 series routers (except the Cisco 2691). Note that the bandwidth is 10 Mbps.

```
Router# show interfaces content-engine 1/0
Content-Engine1/0 is up, line protocol is up
  Hardware is I82559FE, address is 0006.280e.10b0 (bia 0006.280e.10b0)
  MTU 1500 bytes, BW 10000 Kbit, DLY 1000 usec,
     reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation ARPA, loopback not set
  Keepalive set (10 sec)
  ARP type: ARPA, ARP Timeout 04:00:00
  Last input 00:00:50, output 00:00:04, output hang never
  Last clearing of "show interface" counters never
  Input queue: 0/75/0/0 (size/max/drops/flushes); Total output drops: 0
  Queueing strategy: fifo
  Output queue :0/40 (size/max)
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
     13 packets input, 5835 bytes, 0 no buffer
     Received 13 broadcasts, 0 runts, 0 giants, 0 throttles
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored
     0 input packets with dribble condition detected
     71 packets output, 6285 bytes, 0 underruns
     0 output errors, 0 collisions, 0 interface resets
     0 babbles, 0 late collision, 0 deferred
     0 lost carrier, 0 no carrier
     0 output buffer failures, 0 output buffers swapped out
```

The following example displays interface status and data for a CE network module in slot 3 of a Cisco 2691. This example shows the 100-Mbps bandwidth of a Cisco 2691 and all the other supported routers except the remainder of the Cisco 2600 series.

```
Router# show interfaces content-engine 3/0
Content-Engine3/0 is up, line protocol is up
  Hardware is I82559FE, address is 0004.9a0b.4b30 (bia 0004.9a0b.4b30)
  MTU 1500 bytes, BW 100000 Kbit, DLY 100 usec,
     reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation ARPA, loopback not set
  Keepalive set (10 sec)
  ARP type: ARPA, ARP Timeout 04:00:00
  Last input 00:00:41, output 00:00:04, output hang never
  Last clearing of "show interface" counters never
  Input queue: 0/75/0/0 (size/max/drops/flushes); Total output drops: 0
  Queueing strategy: fifo
  Output queue :0/40 (size/max)
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
     14 packets input, 6176 bytes, 0 no buffer
     Received 14 broadcasts, 0 runts, 0 giants, 0 throttles
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored
     0 input packets with dribble condition detected
     109 packets output, 16881 bytes, 0 underruns
     0 output errors, 0 collisions, 1 interface resets
     0 babbles, 0 late collision, 0 deferred
     0 lost carrier, 0 no carrier
     0 output buffer failures, 0 output buffers swapped out
```

The table below describes the significant fields shown in the display.

Table 15: show interfaces content-engine Field Descriptions

Field	Description
Content-Engine	Indicates whether the CE interface hardware is currently active. If the CE interface hardware is operational, the output states that “Content-Engine slot/port is up.” If it has been taken down by an administrator, the output states that “Content-Engine slot/port is administratively down.”
line protocol	Indicates whether the software processes that handle the line protocol consider the line usable or whether the line has been taken down by an administrator.
Hardware...address	Hardware type and address.
MTU	Maximum transmission unit (MTU) of the content engine interface.
BW	Bandwidth of the interface, in kilobits per second.
DLY	Delay of the interface, in microseconds.
reliability	Reliability of the interface as a fraction of 255 (255/255 is 100 percent reliability), calculated as an exponential average over 5 minutes.
txload	Transmit load on the interface as a fraction of 255 (255/255 is completely saturated), calculated as an exponential average over 5 minutes.
rxload	Receive load on the interface as a fraction of 255 (255/255 is completely saturated), calculated as an exponential average over 5 minutes.
Encapsulation	Encapsulation method assigned to the interface.

Field	Description
loopback	Indicates whether loopback is set.
Keepalive	Indicates whether keepalives are set and the interval between keepalives if they have been set.
ARP type...Timeout	Type of Address Resolution Protocol (ARP) assigned and length of timeout.
Last input	Number of hours, minutes, and seconds since the last packet was successfully received by the interface and processed locally on the router. This field is useful for detecting when a dead interface failed. **Note** This field is not updated by fast-switched traffic.
output	Number of hours, minutes, and seconds since the last packet was successfully transmitted by the interface. This field is useful for detecting when a dead interface failed.
output hang	Number of hours, minutes, and seconds (or never) since the interface was last reset because a transmission took too long. When the number of hours in any of the "last" fields exceeds 24 hours, the number of days and hours is printed. If that field overflows, asterisks are printed.
Last clearing	Time at which the counters that measure cumulative statistics (such as number of bytes transmitted and received) shown in this report were last reset to zero. Note that variables that might affect routing (for example, load and reliability) are not cleared when the counters are cleared. Asterisks (***) indicate that the elapsed time is too large to be displayed. A time of all zeroes (0:00:00) indicates that the counters were cleared more than 231 ms (and less than 232 ms) ago.
Input queue	Number of packets in the input queue. Each number is followed by a slash, the maximum size of the queue, the number of packets dropped because of a full queue, and the number of times that queued packets have been discarded.
Total output drops	Number of packets in the output queue that have been dropped because of a full queue.
Queueing strategy	Queueing strategy applied to the interface, which is configurable under the interface. The default is FIFO.
Output queue	Number of packets in the output queue. Each number is followed by a slash, the maximum size of the queue, and the number of packets dropped because of a full queue.

Field	Description
5 minute input rate, 5 minute output rate	Average number of bits and packets transmitted per second in the last 5 minutes. If the interface is not in promiscuous mode, it senses network traffic that it sends and receives (rather than all network traffic). The 5-minute input and output rates should be used only as an approximation of traffic per second during a given 5-minute period. These rates are exponentially weighted averages with a time constant of 5 minutes. A period of four time constants must pass before the average will be within 2 percent of the instantaneous rate of a uniform stream of traffic over that period. **Note** The 5-minute period referenced in this output is a load interval that is configurable under the interface. The default value is 5 minutes.
packets input	Total number of error-free packets received by the system.
bytes	Total number of bytes, including data and MAC encapsulation, in the error-free packets received by the system.
no buffer	Number of received packets discarded because there was no buffer space in the main system. Compare with ignored count. Broadcast storms on Ethernets and bursts of noise on serial lines are often responsible for no input buffer events.
Received...broadcasts	Number of broadcasts received.
runts	Number of packets that are discarded because they are smaller than the minimum packet size of the medium. For instance, any Ethernet packet that is less than 64 bytes is considered a runt.
giants	Number of packets that are discarded because they exceed the maximum packet size of the medium. For example, any Ethernet packet that is greater than 1518 bytes is considered a giant.
throttles	Number of times that the interface requested another interface within the router to slow down.
input errors	Errors that include runts, giants, no buffer, cyclic redundancy check (CRC), frame, overrun, and ignored counts. Other input-related errors can also cause the input errors count to be increased, and some datagrams may have more than one error; therefore, this sum may not balance with the sum of enumerated input error counts.
CRC	Errors created when the CRC generated by the originating LAN station or far-end device does not match the checksum calculated from the data received. On a LAN, this usually indicates noise or transmission problems on the LAN interface or the LAN bus itself. A high number of CRCs is usually the result of collisions or a station that is transmitting bad data.
frame	Number of packets received incorrectly that have a CRC error and a non integer number of octets. On a LAN, this is usually the result of collisions or a malfunctioning Ethernet device.

Field	Description
overrun	Number of times that the receiver hardware was unable to hand received data to a hardware buffer because the input rate exceeded the receiver's ability to handle the data.
ignored	Number of received packets that were ignored by the interface because the interface hardware ran low on internal buffers. These buffers are different from system buffer space described. Broadcast storms and bursts of noise can cause the ignored count to increase.
input packets with dribble condition detected	Number of packets with dribble condition. Dribble bit error indicates that a frame is slightly too long. This frame error counter is incremented just for informational purposes; the router accepts the frame.
packets output	Total number of messages that have been transmitted by the system.
bytes	Total number of bytes, including data and MAC encapsulation, that have been transmitted by the system.
underruns	Number of times that the transmitter has run faster than the router could handle. This may never be reported on some interfaces.
output errors	Sum of all errors that prevented the final transmission of datagrams out of the content engine that is being examined. Note that this may not balance with the sum of the enumerated output errors, because some datagrams may have more than one error, and others may have errors that do not fall into any of the specifically tabulated categories.
collisions	Number of messages that have been retransmitted because of an Ethernet collision. This is usually the result of an overextended LAN (Ethernet or transceiver cable too long, more than two repeaters between stations, or too many cascaded multiport transceivers). A packet that collides is counted only once in output packets.
interface resets	Number of times an interface has been completely reset. This can happen if packets that were queued for transmission were not sent within several seconds. On a serial line, this can be caused by a malfunctioning modem that is not supplying the transmit clock signal or by a cable problem. If the system notices that the carrier detect line of a serial interface is up, but the line protocol is down, it periodically resets the interface in an effort to restart it. Interface resets can also occur when an interface is looped back or shut down.
babbles	Count of frames greater than 1518 bytes that have been transmitted, indicating that the transmitter has been on the interface longer than the time necessary to transmit the largest frame.
late collision	Number of late collisions. A collision becomes a late collision when it occurs after the preamble has been transmitted.
deferred	Deferred indicates that the chip, while ready to transmit a frame, had to defer because the carrier was asserted.
lost carrier	Number of times that the carrier was lost during transmission.

Field	Description
no carrier	Number of times that the carrier was not present during the transmission.
output buffer failures, output buffers swapped out	Number of failed buffers and number of buffers swapped out.

Related Commands

Command	Description
interface content-engine	Configures an interface for a CE network module and enters interface configuration mode.
show controllers content-engine	Displays controller information for CE network modules.

show interfaces counters nonzero

To get the counter information for ports which have non zero values, use the **showinterfacescountersnonzero** command in user EXEC or privileged EXEC mode.

show interfaces counters nonzero [**module** *number*]

Syntax Description

module	(Optional) Limits display to interfaces on module.
number	The module number has a range from 1 to 6.

Command Default

This command has no default settings.

Command Modes

EXEC (>) Privileged EXEC (#)

Command History

Release	Modification
12.2(18)SXF	This command was introduced for Cisco IOS Release 12.2(18)SXF.
12.2(32)SX	This command was integrated into Cisco IOS Release 12.2(32)SX.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.
12.2(32)XJC	This command was integrated into Cisco IOS Release 12.2(32)XJC.

Usage Guidelines

Use the **showinterfacescountersnonzero** command to get the counter information for ports which have non zero values.

Examples

The following example shows the output of **showinterfacescountersnonzero** command. The output is displayed only if any one of the counters is non zero. The counters are checked for all the ports present in the router.

```
Router#sh interfaces counters nonzero
Port                InOctets   InUcastPkts   InMcastPkts   InBcastPkts
Fa3/1              110519159        253605       1276951           574
Gi6/2              120329657        213823       1294339         67009
Port               OutOctets  OutUcastPkts  OutMcastPkts  OutBcastPkts
Fa3/1               15950485           142         41048             1
Gi6/2               15475538           431         41036             6
Port     Last-Clear-Counters
Gi1/1          never
Gi1/2          never
Gi1/3          never
Gi1/4          never
Gi1/5          never
Gi1/6          never
Gi1/7          never
Gi1/8          never
Fa3/1          never
Fa3/2          never
Fa3/3          never
```

```
Fa3/4          never
Router#
```

Related Commands

Command	Description
show interfaces counters	Displays the traffic seen by the physical interface.

show interfaces ctunnel

To display information about an IP over Connectionless Network service (CLNS) tunnel (CTunnel), use the **showinterfacesctunnel** command in privileged EXEC mode.

show interfaces ctunnel *interface-number* [**accounting**]

Syntax Description

interface-number	Virtual interface number.
accounting	(Optional) Displays the number of packets of each protocol type that have been sent through the interface.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.1(5)T	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines

For the **showinterfacesctunnel** command, all output that relates to a physical medium is irrelevant and should be ignored because the CTunnel is a virtual interface.

Examples

The following is sample output from the **showinterfacesctunnel** command:

```
Router# show interfaces ctunnel 1
CTunnel1 is up, line protocol is up
  Hardware is CTunnel
  Internet address is 10.0.0.1/24
  MTU 1514 bytes, BW 9 Kbit, DLY 500000 usec,
      reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation TUNNEL, loopback not set
  Keepalive set (10 sec)
  Tunnel destination 49.0001.2222.2222.2222.cc
  Last input never, output 00:00:05, output hang never
  Last clearing of "show interface" counters never
  Queueing strategy: fifo
  Output queue 0/0, 0 drops; input queue 0/75, 0 drops
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
     0 packets input, 0 bytes, 0 no buffer
     Received 0 broadcasts, 0 runts, 0 giants, 0 throttles
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     1 packets output, 104 bytes, 0 underruns
     0 output errors, 0 collisions, 0 interface resets
     0 output buffer failures, 0 output buffers swapped out
```

The table below describes the significant fields shown in the display.

*Table 16: **show interfaces ctunnel** Field Descriptions*

Field	Description
CTunnel is {up | down | administratively down}	Interface is currently active (up) or inactive (down). Shows interface is administratively down if disabled.
line protocol is {up | down}	Shows line protocol up if a valid route is available to the CLNS tunnel (CTunnel) destination. Shows line protocol down if no route is available, or if the route would be recursive.
Hardware	Type of interface, in this instance CTunnel.
Internet address	IP address of the interface.
MTU	Maximum transmission unit of the interface.
BW	Bandwidth, as specified by the user, that is available on the link.
DLY	Delay of the interface, in microseconds.
Encapsulation	Encapsulation method is always TUNNEL for tunnels.
Loopback	Shows whether loopback is set or not.
Keepalive	Shows whether keepalives are set or not.
Tunnel destination	The NSAP address of the tunnel destination. The N-Selector part of the displayed NSAP address is set by the router and cannot be changed.
Last input	Number of hours, minutes, and seconds since the last packet was successfully received by an interface. This counter is updated only when packets are process-switched, not when packets are fast-switched.
Last clearing	Time at which the counters that measure cumulative statistics (such as number of bytes transmitted and received) shown in this report were last reset to zero. Note that variables that might affect routing (for example, load and reliability) are not cleared when the counters are cleared. *** indicates that the elapsed time is too large to be displayed. 0:00:00 indicates that the counters were cleared more than 231 ms (and less than 232 ms) ago.
Queueing strategy	Type of queueing active on this interface.
Output queue, drops Input queue, drops	Number of packets in output and input queues. Each number is followed by a slash, the maximum size of the queue, and the number of packets dropped because of a full queue.

Field	Description
Five minute input rate, Five minute output rate	Average number of bits and packets transmitted per second in the last 5 minutes. The 5-minute input and output rates should be used only as an approximation of traffic per second during a given 5-minute period. These rates are exponentially weighted averages with a time constant of 5 minutes. A period of 4 time constants must pass before the average will be within 2 percent of the instantaneous rate of a uniform stream of traffic over that period.
packets input	Total number of error-free packets received by the system.
bytes	Total number of bytes in the error-free packets received by the system.
no buffer	Number of received packets discarded because there was no memory buffer available.
broadcasts	Total number of broadcast or multicast packets received by the interface.
runts	This field does not apply to the CTunnel virtual interface.
giants	This field does not apply to the CTunnel virtual interface.
throttles	This field does not apply to the CTunnel virtual interface.
input errors	This field does not apply to the CTunnel virtual interface.
CRC	This field does not apply to the CTunnel virtual interface.
frame	This field does not apply to the CTunnel virtual interface.
overrun	This field does not apply to the CTunnel virtual interface.
ignored	This field does not apply to the CTunnel virtual interface.
abort	This field does not apply to the CTunnel virtual interface.
packets output	Total number of messages transmitted by the system.
bytes	Total number of bytes transmitted by the system.
underruns	This field does not apply to the CTunnel virtual interface.
output errors	This field does not apply to the CTunnel virtual interface.
collisions	This field does not apply to the CTunnel virtual interface.
interface resets	Number of times an interface has been reset. The interface may be reset manually by the administrator or automatically by the system when an internal error occurs.
output buffer failures	Number of buffer failures.
output buffers swapped out	Number of output buffer allocation failures.

Related Commands

Command	Description
show interfaces	Displays the statistical information specific to interfaces.

show interfaces debounce

To display the status and configuration for the debounce timer, use the **showinterfacesdebounce** command in user EXEC or privileged EXEC mode.

show interfaces [*interface interface-number* | **null** *interface-number* | **vlan** *vlan-id*] **debounce** [**module** *num*]

Syntax Description

interface	(Optional) Interface type; possible valid values are **ethernet**, **fastethernet**, **gigabitethernet**, **tengigabitethernet**, **port-channel**, **pos**, **atm**, and **ge-wan**.
interface-number	(Optional) Module and port number; see the "Usage Guidelines" section for valid values.
null *interface-number*	(Optional) Specifies the null interface; the valid value is **0**.
vlan *vlan-id*	(Optional) Specifies the VLAN; valid values are from 1 to 4094.
module *num*	(Optional) Limits the display to interfaces on the specified module.

Command Default

This command has no default settings.

Command Modes

User EXEC Privileged EXEC

Command History

Release	Modification
12.2(14)SX	Support for this command was introduced on the Supervisor Engine 720.
12.2(17d)SXB	Support for this command on the Supervisor Engine 2 was extended to Release 12.2(17d)SXB.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

Usage Guidelines

The **pos**, **atm**, and **ge-wan** keywords are supported on Cisco 7600 series routers that are configured with a Supervisor Engine 2.

The debounce timer is not supported on the 10-Gigabit Ethernet module (WSX-6502-10GE).

The *interface-number* argument designates the module and port number. Valid values for *interface-number* depend on the specified interface type and the chassis and module that are used. For example, if you specify a Gigabit Ethernet interface and have a 48-port 10/100BASE-T Ethernet module that is installed in a 13-slot chassis, valid values for the module number are from 1 to 13 and valid values for the port number are from 1 to 48.

The port-channel values are from 0 to 282; values from 257 to 282 are supported on the CSM and the FWSM only.

Examples

This example shows how to display the debounce configuration of an interface:

```
Router> show interfaces GigabitEthernet 1/1 debounce
Port   Debounce time   Value
```

```
Gi1/1   enable          100
Router>
```

Related Commands

Command	Description
link debounce	Enables the debounce timer on an interface.

show interfaces description

To display a description and a status of an interface, use the **showinterfacesdescription** command in user EXEC or privileged EXEC mode.

show interfaces [*interface*] **description**

Syntax Description

interface	(Optional) Interface type; for a list of valid values, see the "Usage Guidelines" section .

Command Default

This command has no default settings.

Command Modes

User EXEC Privileged EXEC

Command History

Release	Modification
12.2(14)SX	Support for this command was introduced on the Supervisor Engine 720.
12.2(17d)SXB	Support for this command on the Supervisor Engine 2 was extended to Release 12.2(17d)SXB.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

Usage Guidelines

When you enter the *interface* value, these formats can be used:

- *card-type slot /first-port - last-port*
- *card-type slot /first-port - last-port*

You can define a single port range per command entry. If you specify a range of ports, the range must consist of the same slot and port type. When you define a range, you must enter a space before and after the hyphen (-) as follows:

```
show interfaces gigabitethernet7/1 - 7 counters broadcast
```

Possible valid values for *card-type* are **ethernet**, **fastethernet**, **gigabitethernet**, **tengigabitethernet**, **port-channel**, **pos**, **atm**, and **ge-wan**

The **pos**, **atm**, and **ge-wan** keywords are supported on Cisco 7600 series routers that are configured with a Supervisor Engine 2.

The port-channel values are from 0 to 282; values from 257 to 282 are supported on the CSM and the FWSM only.

Examples

This example shows how to display the information for all interfaces:

```
Router> show interfaces description
 Interface Status         Protocol Description
 PO0/0     admin down     down     First POS interface
 PO0/1     admin down     down
 Gi1/0     up             up       GigE to server farm
Router>
```

Related Commands

Command	Description
description	Includes a specific description about the DSP interface.

show interfaces ethernet

To display information about an Ethernet interface on the router, use the **showinterfacesethernet** command in privileged EXEC mode.

Standard Syntax
show interfaces ethernet [*number*] [**accounting**]

Cisco 7200 and 7500 Series
show interfaces : ethernet accounting optionshow interfaces ethernet [*slot / port*] [**accounting**]

Cisco 7500 Series with Ports on VIPs
show interfaces ethernet [*slot / port-adapter / port*]

Catalyst 6500 Series Switches
show interfaces ethernet [**vlan** *vlan*]

Syntax Description

number	(Optional) Port number on the selected interface.
accounting	(Optional) Displays the number of packets of each protocol type that have been sent through the interface.
slot	(Optional) Slot number. Refer to the appropriate hardware manual for slot and port information.
/ *port*	(Optional) Port number. Refer to the appropriate hardware manual for slot and port information.
/ *port-adapter*	(Optional) Port adapter number. Refer to the appropriate hardware manual for information about port adapter compatibility.
vlan *vlan*	(Optional) Specifies a VLAN. Limits the display of switch port information to the specified VLAN. Range: 1 to 4094.

Command Modes

Privileged EXEC

Command History

Release	Modification
10.0	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
12.2(33)SXI	This command was changed to add the optional **vlan***vlan* keyword and argument.

Usage Guidelines

If you do not provide values for the *number*argument (or *slot*, *port*, and *port-adapter* arguments), the command displays statistics for all network interfaces. The optional keyword **accounting** displays the number of packets of each protocol type that have been sent through the interface.

Cisco IOS Release 12.2(33)SXI and later releases allow you to limit the display of switch port information to the specified VLAN.

Examples

The following is sample output from the **showinterfacesethernet**command for Ethernet interface 0:

```
Router# show interfaces ethernet 0
Ethernet0 is up, line protocol is up
  Hardware is Lance, address is 0060.3ef1.702b (bia 0060.3ef1.702b)
  Internet address is 172.21.102.33/24
  MTU 1500 bytes, BW 10000 Kbit, DLY 1000 usec, rely 255/255, load 1/255
  Encapsulation ARPA, loopback not set, keepalive set (10 sec)
  ARP type: ARPA, ARP Timeout 04:00:00
  Last input 00:00:20, output 00:00:06, output hang never
  Last clearing of "show interface" counters never
  Queueing strategy: fifo
  Output queue 0/40, 0 drops; input queue 0/75, 0 drops
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
     115331 packets input, 27282407 bytes, 0 no buffer
     Received 93567 broadcasts, 0 runts, 0 giants, 0 throttles
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     0 input packets with dribble condition detected
     143782 packets output, 14482169 bytes, 0 underruns
     0 output errors, 1 collisions, 5 interface resets
     0 babbles, 0 late collision, 7 deferred
     0 lost carrier, 0 no carrier
     0 output buffer failures, 0 output buffers swapped out
```

The table below describes significant fields shown in the display.

*Table 17: **show interfaces ethernet** Field Descriptions*

Field	Description
Ethernet ... is up ... is administratively down	Indicates whether the interface hardware is currently active and if it has been taken down by an administrator. “Disabled” indicates the router has received over 5000 errors in a keepalive interval, which is 10 seconds by default.
line protocol is {up | down | administratively down}	Indicates whether the software processes that handle the line protocol believe the interface is usable (that is, whether keepalives are successful) or if it has been taken down by an administrator.
Hardware	Hardware type (for example, MCI Ethernet, SCI, cBus Ethernet) and address.
Internet address	Internet address followed by subnet mask.
MTU	Maximum transmission unit of the interface.
BW	Bandwidth of the interface, in kilobits per second.
DLY	Delay of the interface, in microseconds.
rely	Reliability of the interface as a fraction of 255 (255/255 is 100 percent reliability), calculated as an exponential average over 5 minutes.

Field	Description
load	Load on the interface as a fraction of 255 (255/255 is completely saturated), calculated as an exponential average over 5 minutes.
Encapsulation	Encapsulation method assigned to interface.
ARP type:	Type of Address Resolution Protocol assigned.
loopback	Indicates whether loopback is set or not.
keepalive	Indicates whether keepalives are set or not.
Last input	Number of hours, minutes, and seconds since the last packet was successfully received by an interface and processed locally on the router. Useful for knowing when a dead interface failed. This counter is updated only when packets are process-switched, not when packets are fast-switched.
Last output	Number of hours, minutes, and seconds since the last packet was successfully transmitted by an interface. This counter is updated only when packets are process-switched, not when packets are fast-switched.
output	Number of hours, minutes, and seconds since the last packet was successfully transmitted by the interface. Useful for knowing when a dead interface failed.
output hang	Number of hours, minutes, and seconds (or never) since the interface was last reset because of a transmission that took too long. When the number of hours in any of the “last” fields exceeds 24 hours, the number of days and hours is printed. If that field overflows, asterisks are printed.
Last clearing	Time at which the counters that measure cumulative statistics (such as number of bytes transmitted and received) shown in this report were last reset to zero. Note that variables that might affect routing (for example, load and reliability) are not cleared when the counters are cleared. *** indicates the elapsed time is too large to be displayed. 0:00:00 indicates the counters were cleared more than 231 ms (and less than 232 ms) ago.
Output queue, input queue, drops	Number of packets in output and input queues. Each number is followed by a slash, the maximum size of the queue, and the number of packets dropped because of a full queue.
5 minute input rate, 5 minute output rate	Average number of bits and packets transmitted per second in the last five minutes. If the interface is not in promiscuous mode, it senses network traffic it sends and receives (rather than all network traffic). The five-minute input and output rates should be used only as an approximation of traffic per second during a given five-minute period. These rates are exponentially weighted averages with a time constant of five minutes. A period of four time constants must pass before the average will be within two percent of the instantaneous rate of a uniform stream of traffic over that period.
packets input	Total number of error-free packets received by the system.

Field	Description
bytes input	Total number of bytes, including data and MAC encapsulation, in the error-free packets received by the system.
no buffers	Number of received packets discarded because there was no buffer space in the main system. Compare with ignored count. Broadcast storms on Ethernet networks and bursts of noise on serial lines are often responsible for no input buffer events.
Received ... broadcasts	Total number of broadcast or multicast packets received by the interface.
runts	Number of packets that are discarded because they are smaller than the minimum packet size of the medium. For instance, any Ethernet packet that is less than 64 bytes is considered a runt.
giants	Number of packets that are discarded because they exceed the maximum packet size of the medium. For example, any Ethernet packet that is greater than 1518 bytes is considered a giant.
input error	Includes runts, giants, no buffer, CRC, frame, overrun, and ignored counts. Other input-related errors can also cause the input errors count to be increased, and some datagrams may have more than one error; therefore, this sum may not balance with the sum of enumerated input error counts.
CRC	Cyclic redundancy checksum generated by the originating LAN station or far-end device does not match the checksum calculated from the data received. On a LAN, this usually indicates noise or transmission problems on the LAN interface or the LAN bus itself. A high number of CRCs is usually the result of collisions or a station transmitting bad data.
frame	Number of packets received incorrectly having a CRC error and a noninteger number of octets. On a LAN, this is usually the result of collisions or a malfunctioning Ethernet device.
overrun	Number of times the receiver hardware was unable to hand received data to a hardware buffer because the input rate exceeded the receiver’s ability to handle the data.
ignored	Number of received packets ignored by the interface because the interface hardware ran low on internal buffers. These buffers are different than the system buffers mentioned previously in the buffer description. Broadcast storms and bursts of noise can cause the ignored count to be increased.
input packets with dribble condition detected	Dribble bit error indicates that a frame is slightly too long. This frame error counter is incremented just for informational purposes; the router accepts the frame.
packets output	Total number of messages transmitted by the system.
bytes	Total number of bytes, including data and MAC encapsulation, transmitted by the system.
underruns	Number of times that the transmitter has been running faster than the router can handle. This may never be reported on some interfaces.

Field	Description
output errors	Sum of all errors that prevented the final transmission of datagrams out of the interface being examined. Note that this may not balance with the sum of the enumerated output errors, as some datagrams may have more than one error, and others may have errors that do not fall into any of the specifically tabulated categories.
collisions	Number of messages transmitted because of an Ethernet collision. A packet that collides is counted only once in output packets.
interface resets	Number of times an interface has been completely reset. This can happen if packets queued for transmission were not sent within several seconds. On a serial line, this can be caused by a malfunctioning modem that is not supplying the transmit clock signal, or by a cable problem. If the system notices that the carrier detect line of a serial interface is up, but the line protocol is down, it periodically resets the interface in an effort to restart it. Interface resets can also occur when an interface is looped back or shut down.
restarts	Number of times a Type 2 Ethernet controller was restarted because of errors.
babbles	The transmit jabber timer expired.
late collision	Number of late collisions. Late collision happens when a collision occurs after transmitting the preamble. The most common cause of late collisions is that your Ethernet cable segments are too long for the speed at which you are transmitting.
deferred	Deferred indicates that the chip had to defer while ready to transmit a frame because the carrier was asserted.
lost carrier	Number of times the carrier was lost during transmission.
no carrier	Number of times the carrier was not present during the transmission.
output buffer failures	Number of failed buffers and number of buffers swapped out.

Example on Cisco 7500 Series Routers

The following sample output illustrates the **showinterfacesethernet** command on a Cisco 7500 series router:

```
Router# show interfaces ethernet 4/2
Ethernet4/2 is up, line protocol is up
  Hardware is cxBus Ethernet, address is 0000.0c02.d0ce (bia 0000.0c02.d0ce)
  Internet address is 10.108.7.1, subnet mask is 255.255.255.0
  MTU 1500 bytes, BW 10000 Kbit, DLY 1000 usec, rely 255/255, load 1/255
  Encapsulation ARPA, loopback not set, keepalive set (10 sec)
  ARP type: ARPA, ARP Timeout 4:00:00
  Last input 0:00:00, output 0:00:09, output hang never
  Last clearing of "show interface" counters 0:56:40
  Output queue 0/40, 0 drops; input queue 0/75, 0 drops
  Five minute input rate 3000 bits/sec, 4 packets/sec
  Five minute output rate 0 bits/sec, 0 packets/sec
     4961 packets input, 715381 bytes, 0 no buffer
```

```
Received 2014 broadcasts, 0 runts, 0 giants
0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
567 packets output, 224914 bytes, 0 underruns
0 output errors, 168 collisions, 0 interface resets, 0 restarts
0 babbles, 2 late collision, 7 deferred
0 lost carrier, 0 no carrier
0 output buffer failures, 0 output buffers swapped out
```

Example with Accounting Option

The following is sample output from the **showinterfacesethernet** command with the **accounting** option on a Cisco 7500 series router:

```
Router# show interfaces ethernet 4/2 accounting
Ethernet4/2
       Protocol    Pkts In   Chars In   Pkts Out  Chars Out
             IP       7344    4787842       1803    1535774
      Appletalk      33345    4797459      12781    1089695
        DEC MOP          0          0        127       9779
            ARP          7        420         39       2340
```

The table below describes the fields shown in the display.

*Table 18: **show interfaces ethernet** Field Descriptions--Accounting*

Field	Description
Protocol	Protocol that is operating on the interface.
Pkts In	Number of packets received for that protocol.
Chars In	Number of characters received for that protocol.
Pkts Out	Number of packets transmitted for that protocol.
Chars Out	Number of characters transmitted for that protocol.

Catalyst 6500 Series Switches

The following is sample output from the **showinterfacesethernet**command for VLAN 2:

```
Router# show interfaces ethernet vlan 2
```

show interfaces fastethernet

To display information about the Fast Ethernet interfaces, use the **showinterfacesfastethernet** command in user EXEC or privileged EXEC mode.

Standard Syntax
show interfaces fastethernet [*number*]

Cisco 7200 and Cisco 7500 Series
show interfaces fastethernet [*slot*/*port*]

Cisco 7500 Series with a VIP
show interfaces fastethernet [*slot*/*port-adapter*/*port*]

Syntax Description

number	(Optional) Port, connector, or interface card number. On a Cisco 4700 series routers, specifies the network interface module (NIM) or NPM number. The numbers are assigned at the factory at the time of installation or when added to a system.
slot	(Optional) Slot number. Refer to the appropriate hardware manual for slot and port information.
port	(Optional) Port number. Refer to the appropriate hardware manual for slot and port information.
port-adapter	(Optional) Port adapter number. Refer to the appropriate hardware manual for information about port adapter compatibility.

Command Modes

User EXEC Privileged EXEC

Command History

Release	Modification
11.2	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Examples

The following is sample output from the **showinterfacesfastethernet** command on a Cisco 4700 series router:

```
Router# show interfaces fastethernet 0
Fast Ethernet0 is up, line protocol is up
  Hardware is DEC21140, address is 0000.0c0c.1111 (bia 0002.eaa3.5a60)
  Internet address is 10.0.0.1 255.0.0.0
  MTU 1500 bytes, BW 100000 Kbit, DLY 100 usec, rely 255/255, load 1/255
  Encapsulation ARPA, loopback not set, keepalive not set, hdx, 100BaseTX
  ARP type: ARPA, ARP Timeout 4:00:00
  Last input never, output 0:00:16, output hang 0:28:01
  Last clearing of "show interface" counters 0:20:05
```

```
  Output queue 0/40, 0 drops; input queue 0/75, 0 drops
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
     0 packets input, 0 bytes, 0 no buffer
     Received 0 broadcasts, 0 runts, 0 giants
     0 input errors, 0 CRC, 0 frame, 0 overrun, 1786161921 ignored, 0 abort
     0 watchdog, 0 multicast
     0 input packets with dribble condition detected
     67 packets output, 8151 bytes, 0 underruns
     0 output errors, 0 collisions, 1 interface resets, 0 restarts
     0 babbles, 0 late collision, 0 deferred
     0 lost carrier, 0 no carrier
     0 output buffer failures, 0 output buffers swapped out
```

The following is sample output from the **showinterfacesfastethernet** command on a Cisco AS5300 access server:

```
Router# show interfaces fastethernet 0
Fast Ethernet0 is up, line protocol is up
  Hardware is DEC21140AD, address is 00e0.1e3e.c179 (bia 00e0.1e3e.c179)
  Internet address is 10.17.30.4/16
  MTU 1500 bytes, BW 10000 Kbit, DLY 1000 usec, rely 255/255, load 1/255
  Encapsulation ARPA, loopback not set, keepalive set (10 sec)
  Half-duplex, 10Mb/s, 100BaseTX/FX
  ARP type: ARPA, ARP Timeout 04:00:00
  Last input 00:00:00, output 00:00:03, output hang never
  Last clearing of "show interface" counters never
  Queueing strategy: fifo
  Output queue 0/40, 0 drops; input queue 0/120, 8 drops
  5 minute input rate 2000 bits/sec, 3 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
     158773 packets input, 17362631 bytes, 4 no buffer
     Received 158781 broadcasts, 0 runts, 0 giants, 7 throttles
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     0 watchdog, 0 multicast
     0 input packets with dribble condition detected
     6299 packets output, 622530 bytes, 0 underruns
     1 output errors, 0 collisions, 3 interface resets
     0 babbles, 0 late collision, 0 deferred
     1 lost carrier, 1 no carrier
     0 output buffer failures, 0 output buffers swapped out
```

The following shows information specific to the first Fast Ethernet Interface Processor (FEIP) port in slot 0 on a Cisco 7500 series router:

```
Router# show interfaces fastethernet 0/1
Fast Ethernet0/1 is administratively down, line protocol is down
  Hardware is cxBus Fast Ethernet, address is 0000.0c35.dc16 (bia 0000.0c35.dc16)
  Internet address is 10.1.0.64 255.255.0.0
  MTU 1500 bytes, BW 100000 Kbit, DLY 100 usec, rely 255/255, load 1/255
  Encapsulation ARPA, loopback not set, keepalive not set, half-duplex, RJ45 (or MII)
  ARP type: ARPA, ARP Timeout 4:00:00
  Last input never, output 2:03:52, output hang never
  Last clearing of "show interface" counters never
  Output queue 0/40, 0 drops; input queue 0/75, 1 drops
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
     0 packets input, 0 bytes, 0 no buffer
     Received 0 broadcasts, 0 runts, 0 giants
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     0 watchdog, 0 multicast
     0 input packets with dribble condition detected
     5 packets output, 805 bytes, 0 underruns
```

```
0 output errors, 0 collisions, 4 interface resets, 0 restarts
0 babbles, 0 late collision, 0 deferred
0 lost carrier, 0 no carrier
0 output buffer failures, 0 output buffers swapped out
```

The table below describes the fields shown in these displays.

*Table 19: **show interfaces fastethernet** Field Descriptions*

Field	Description
Fast Ethernet0 is ... is up ...is administratively down	Indicates whether the interface hardware is currently active and if it has been taken down by an administrator.
line protocol is	Indicates whether the software processes that handle the line protocol consider the line usable or if it has been taken down by an administrator.
Hardware	Hardware type (for example, MCI Ethernet, SCI, cBus Ethernet) and address.
Internet address	Internet address followed by subnet mask.
MTU	Maximum transmission unit of the interface.
BW	Bandwidth of the interface, in kilobits per second.
DLY	Delay of the interface, in microseconds.
rely	Reliability of the interface as a fraction of 255 (255/255 is 100 percent reliability), calculated as an exponential average over 5 minutes.
load	Load on the interface as a fraction of 255 (255/255 is completely saturated), calculated as an exponential average over 5 minutes.
Encapsulation	Encapsulation method assigned to interface.
ARP type	Type of Address Resolution Protocol assigned.
loopback	Indicates whether loopback is set or not.
keepalive	Indicates whether keepalives are set or not.
Last input	Number of hours, minutes, and seconds since the last packet was successfully received by an interface and processed locally on the router. Useful for knowing when a dead interface failed. This counter is updated only when packets are process-switched, not when packets are fast-switched.
output	Number of hours, minutes, and seconds since the last packet was successfully transmitted by the interface. Useful for knowing when a dead interface failed. This counter is updated only when packets are process-switched, not when packets are fast-switched.
output hang	Number of hours, minutes, and seconds (or never) since the interface was last reset because of a transmission that took too long. When the number of hours in any of the “last” fields exceeds 24 hours, the number of days and hours is printed. If that field overflows, asterisks are printed.

Field	Description
Last clearing	Time at which the counters that measure cumulative statistics (such as number of bytes transmitted and received) shown in this report were last reset to zero. Note that variables that might affect routing (for example, load and reliability) are not cleared when the counters are cleared. *** indicates the elapsed time is too large to be displayed. 0:00:00 indicates the counters were cleared more than 231 ms (and less than 232 ms) ago.
Output queue, input queue, drops	Number of packets in output and input queues. Each number is followed by a slash, the maximum size of the queue, and the number of packets dropped because of a full queue.
5 minute input rate, 5 minute output rate	Average number of bits and packets transmitted per second in the last 5 minutes. If the interface is not in promiscuous mode, it senses network traffic it sends and receives (rather than all network traffic). The 5-minute input and output rates should be used only as an approximation of traffic per second during a given 5-minute period. These rates are exponentially weighted averages with a time constant of 5 minutes. A period of four time constants must pass before the average will be within two percent of the instantaneous rate of a uniform stream of traffic over that period.
packets input	Total number of error-free packets received by the system.
bytes	Total number of bytes, including data and MAC encapsulation, in the error-free packets received by the system.
no buffer	Number of received packets discarded because there was no buffer space in the main system. Compare with ignored count. Broadcast storms on Ethernets and bursts of noise on serial lines are often responsible for no input buffer events.
Received ... broadcasts	Total number of broadcast or multicast packets received by the interface.
runts	Number of packets that are discarded because they are smaller than the minimum packet size of the medium. For instance, any Ethernet packet that is less than 64 bytes is considered a runt.
giants	Number of packets that are discarded because they exceed the maximum packet size of the medium. For example, any Ethernet packet that is greater than 1518 bytes is considered a giant.
input errors	Includes runts, giants, no buffer, CRC, frame, overrun, and ignored counts. Other input-related errors can also cause the input errors count to be increased, and some datagrams may have more than one error; therefore, this sum may not balance with the sum of enumerated input error counts.
CRC	Cyclic redundancy checksum generated by the originating LAN station or far-end device does not match the checksum calculated from the data received. On a LAN, this usually indicates noise or transmission problems on the LAN interface or the LAN bus itself. A high number of CRCs is usually the result of collisions or a station transmitting bad data.

Field	Description
frame	Number of packets received incorrectly having a CRC error and a noninteger number of octets. On a LAN, this is usually the result of collisions or a malfunctioning Ethernet device.
overrun	Number of times the receiver hardware was unable to hand received data to a hardware buffer because the input rate exceeded the receiver's ability to handle the data.
ignored	Number of received packets ignored by the interface because the interface hardware ran low on internal buffers. These buffers are different than the system buffers mentioned previously in the buffer description. Broadcast storms and bursts of noise can cause the ignored count to be increased.
abort	Number of packets whose receipt was aborted.
watchdog	Number of times watchdog receive timer expired. It happens when receiving a packet with length greater than 2048.
multicast	Number of multicast packets received.
input packets with dribble condition detected	Dribble bit error indicates that a frame is slightly too long. This frame error counter is incremented just for informational purposes; the router accepts the frame.
packets output	Total number of messages transmitted by the system.
bytes	Total number of bytes, including data and MAC encapsulation, transmitted by the system.
underruns	Number of times that the transmitter has been running faster than the router can handle. This may never be reported on some interfaces.
output errors	Sum of all errors that prevented the final transmission of datagrams out of the interface being examined. Note that this may not balance with the sum of the enumerated output errors, as some datagrams may have more than one error, and others may have errors that do not fall into any of the specifically tabulated categories.
collisions	Number of messages retransmitted because of an Ethernet collision. A packet that collides is counted only once in output packets.
interface resets	Number of times an interface has been completely reset. This can happen if packets queued for transmission were not sent within several seconds. On a serial line, this can be caused by a malfunctioning modem that is not supplying the transmit clock signal, or by a cable problem. If the system notices that the carrier detect line of a serial interface is up, but the line protocol is down, it periodically resets the interface in an effort to restart it. Interface resets can also occur when an interface is looped back or shut down.
restarts	Number of times a Type 2 Ethernet controller was restarted because of errors.
babbles	The transmit jabber timer expired.

Field	Description
late collision	Number of late collisions. Late collision happens when a collision occurs after transmitting the preamble. The most common cause of late collisions is that your Ethernet cable segments are too long for the speed at which you are transmitting.
deferred	Deferred indicates that the chip had to defer while ready to transmit a frame because the carrier was asserted.
lost carrier	Number of times the carrier was lost during transmission.
no carrier	Number of times the carrier was not present during the transmission.
output buffer failures	Number of failed buffers and number of buffers swapped out.

The following example of the **showinterfacesfastethernet**command shows all the information specific to the first PA-12E/2FE interface port (interface port 0) in port adapter slot 3:

```
Router# show interfaces fastethernet 3/0
Fast Ethernet3/0 is up, line protocol is up
  Hardware is TSWITCH, address is 00e0.f7a4.5130 (bia 00e0.f7a4.5130)
  MTU 1500 bytes, BW 100000 Kbit, DLY 100 usec, rely 255/255, load 1/255
  Encapsulation ARPA, loopback not set, keepalive set (10 sec)
  Half-duplex, 100BaseTX
  ARP type: ARPA, ARP Timeout 04:00:00
  Last input 00:05:30, output 00:00:00, output hang never
  Last clearing of "show interface" counters never
  Queueing strategy: fifo
  Output queue 0/40, 0 drops; input queue 0/75, 0 drops
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
     312 packets input, 18370 bytes, 0 no buffer
     Received 216 broadcasts, 0 runts, 0 giants, 0 throttles
     3 input errors, 0 CRC, 0 frame, 0 overrun, 3 ignored, 0 abort
     0 input packets with dribble condition detected
     15490 packets output, 1555780 bytes, 0 underruns
     2 output errors, 0 collisions, 2 interface resets
     0 babbles, 0 late collision, 0 deferred
     0 lost carrier, 0 no carrier
     2 output buffer failures, 0 output buffers swapped out
```

The table below describes the fields shown in this display.

Table 20: show interfaces fastethernet Field Descriptions--PA-12E/2FE

Field	Description
Fast Ethernet... is up ...is administratively down	Indicates whether the interface hardware is currently active and if it has been taken down by an administrator.
line protocol is	Indicates whether the software processes that handle the line protocol consider the line usable or if it has been taken down by an administrator.
Hardware	Hardware type (for example, MCI Ethernet, SCI, cBus Ethernet) and address.
Internet address	Internet address followed by subnet mask.
MTU	Maximum transmission unit of the interface.

Field	Description
BW	Bandwidth of the interface, in kilobits per second.
DLY	Delay of the interface, in microseconds.
rely	Reliability of the interface as a fraction of 255 (255/255 is 100 percent reliability), calculated as an exponential average over 5 minutes.
load	Load on the interface as a fraction of 255 (255/255 is completely saturated), calculated as an exponential average over 5 minutes.
Encapsulation	Encapsulation method assigned to interface.
ARP type	Type of Address Resolution Protocol assigned.
loopback	Indicates whether loopback is set or not.
keepalive	Indicates whether keepalives are set or not.
Last input	Number of hours, minutes, and seconds since the last packet was successfully received by an interface and processed locally on the router. Useful for knowing when a dead interface failed. This counter is updated only when packets are process-switched, not when packets are fast-switched.
output	Number of hours, minutes, and seconds since the last packet was successfully transmitted by the interface. Useful for knowing when a dead interface failed.
output hang	Number of hours, minutes, and seconds (or never) since the interface was last reset because of a transmission that took too long. When the number of hours in any of the “last” fields exceeds 24 hours, the number of days and hours is printed. If that field overflows, asterisks are printed.
Last clearing	Time at which the counters that measure cumulative statistics (such as number of bytes transmitted and received) shown in this report were last reset to zero. Note that variables that might affect routing (for example, load and reliability) are not cleared when the counters are cleared. *** indicates the elapsed time is too large to be displayed. 0:00:00 indicates the counters were cleared more than 231 ms (and less than 232 ms) ago.
Output queue, input queue, drops	Number of packets in output and input queues. Each number is followed by a slash, the maximum size of the queue, and the number of packets dropped because of a full queue.

Field	Description
5 minute input rate, 5 minute output rate	Average number of bits and packets transmitted per second in the last 5 minutes. If the interface is not in promiscuous mode, it senses network traffic it sends and receives (rather than all network traffic). The 5-minute input and output rates should be used only as an approximation of traffic per second during a given 5-minute period. These rates are exponentially weighted averages with a time constant of 5 minutes. A period of four time constants must pass before the average will be within two percent of the instantaneous rate of a uniform stream of traffic over that period.
packets input	Total number of error-free packets received by the system.
bytes	Total number of bytes, including data and MAC encapsulation, in the error-free packets received by the system.
no buffer	Number of received packets discarded because there was no buffer space in the main system. Compare with ignored count. Broadcast storms on Ethernets and bursts of noise on serial lines are often responsible for no input buffer events.
Received ... broadcasts	Total number of broadcast or multicast packets received by the interface.
runts	Number of packets that are discarded because they are smaller than the minimum packet size of the medium. For instance, any Ethernet packet that is less than 64 bytes is considered a runt.
giants	Number of packets that are discarded because they exceed the maximum packet size of the medium. For example, any Ethernet packet that is greater than 1518 bytes is considered a giant.
throttles	Number of times the receiver on the port was disabled, possibly because of buffer or processor overload.
input errors	Includes runts, giants, no buffer, CRC, frame, overrun, and ignored counts. Other input-related errors can also cause the input errors count to be increased, and some datagrams may have more than one error; therefore, this sum may not balance with the sum of enumerated input error counts.
CRC	Cyclic redundancy checksum generated by the originating LAN station or far-end device does not match the checksum calculated from the data received. On a LAN, this usually indicates noise or transmission problems on the LAN interface or the LAN bus itself. A high number of CRCs is usually the result of collisions or a station transmitting bad data.
frame	Number of packets received incorrectly having a CRC error and a noninteger number of octets. On a LAN, this is usually the result of collisions or a malfunctioning Ethernet device.
overrun	Number of times the receiver hardware was unable to hand received data to a hardware buffer because the input rate exceeded the receiver’s ability to handle the data.

Field	Description
ignored	Number of received packets ignored by the interface because the interface hardware ran low on internal buffers. These buffers are different than the system buffers mentioned previously in the buffer description. Broadcast storms and bursts of noise can cause the ignored count to be increased.
abort	Number of packets whose receipt was aborted.
input packets with dribble condition detected	Dribble bit error indicates that a frame is slightly too long. This frame error counter is incremented for informational purposes; the router accepts the frame.
packets output	Total number of messages transmitted by the system.
bytes	Total number of bytes, including data and MAC encapsulation, transmitted by the system.
underruns	Number of times that the transmitter has been running faster than the router can handle. This may never be reported on some interfaces.
output errors	Sum of all errors that prevented the final transmission of datagrams out of the interface being examined. Note that this may not balance with the sum of the enumerated output errors, as some datagrams may have more than one error, and others may have errors that do not fall into any of the specifically tabulated categories.
collisions	Number of messages retransmitted because of an Ethernet collision. A packet that collides is counted only once in output packets.
interface resets	Number of times an interface has been completely reset. This can happen if packets queued for transmission were not sent within several seconds. On a serial line, this can be caused by a malfunctioning modem that is not supplying the transmit clock signal, or by a cable problem. If the system notices that the carrier detect line of a serial interface is up, but the line protocol is down, it periodically resets the interface in an effort to restart it. Interface resets can also occur when an interface is looped back or shut down.
babbles	Transmit jabber timer expired.
late collision	Number of late collisions. Late collision happens when a collision occurs after transmitting the preamble. The most common cause of late collisions is that your Ethernet cable segments are too long for the speed at which you are transmitting.
deferred	Deferred indicates that the chip had to defer while ready to transmit a frame because the carrier was asserted.
lost carrier	Number of times the carrier was lost during transmission.
no carrier	Number of times the carrier was not present during the transmission.

show interfaces fddi

To display information about the FDDI interface, use the **showinterfacesfddi**command in user EXEC or privileged EXEC mode.

Standard Syntax
show interfaces fddi *number* [**accounting**]

Cisco 7000 and Cisco 7200 Series
show interfaces : fddi accounting optionshow interfaces fddi [*slot/port*] [**accounting**]

Cisco 7500 Series
show interfaces fddi [*slot/port-adapter/port*] [**accounting**]

Syntax Description

number	Port number on the selected interface.
accounting	(Optional) Displays the number of packets of each protocol type that have been sent through the interface.
slot	(Optional) Slot number. Refer to the appropriate hardware manual for slot and port information.
port	(Optional) Port number. Refer to the appropriate hardware manual for slot and port information.
port-adapter	(Optional) Port adapter number. Refer to the appropriate hardware manual for information about port adapter compatibility.

Command Modes

User EXEC Privileged EXEC

Command History

Release	Modification
10.0	This command was introduced.
11.3	This command was modified to include support for FDDI full-duplex, single- and multimode port adapters (PA-F/FD-SM and PA-F/FD-MM).
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Examples

The following is a sample partial display of FDDI-specific data from the **showinterfacesfddi** command on a Cisco 7500 series router:

```
Router# show interfaces fddi 3/0/0

Fddi3/0/0 is up, line protocol is up
  Hardware is cxBus Fddi, address is 0000.0c02.adf1 (bia 0000.0c02.adf1)
  Internet address is 10.108.33.14, subnet mask is 255.255.255.0
```

```
  MTU 4470 bytes, BW 100000 Kbit, DLY 100 usec, rely 255/255, load 1/255
  Encapsulation SNAP, loopback not set, keepalive not set
  ARP type: SNAP, ARP Timeout 4:00:00
  Phy-A state is active, neighbor is   B, cmt signal bits 008/20C, status ILS
  Phy-B state is active, neighbor is   A, cmt signal bits 20C/008, status ILS
  ECM is in, CFM is thru, RMT is ring_op
  Token rotation 5000 usec, ring operational 21:32:34
  Upstream neighbor 0000.0c02.ba83, downstream neighbor 0000.0c02.ba83
  Last input 0:00:05, output 0:00:00, output hang never
  Last clearing of "show interface" counters 0:59:10
  Output queue 0/40, 0 drops; input queue 0/75, 0 drops
  Five minute input rate 69000 bits/sec, 44 packets/sec
  Five minute output rate 0 bits/sec, 1 packets/sec
     113157 packets input, 21622582 bytes, 0 no buffer
     Received 276 broadcasts, 0 runts, 0 giants
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     4740 packets output, 487346 bytes, 0 underruns
     0 output errors, 0 collisions, 0 interface resets, 0 restarts
     0 transitions, 2 traces, 3 claims, 2 beacons
```

The following is sample output from the **showinterfacesfddi**command for the full-duplex FDDI port adapter on a Cisco 7500 series router:

```
Router# show interfaces fddi 0/1/0
Fddi0/1/0 is up, line protocol is up
  Hardware is cxBus FDDI, address is 0060.3e33.3608 (bia 0060.3e33.3608)
  Internet address is 10.1.1.1/24
  MTU 4470 bytes, BW 100000 Kbit, DLY 100 usec, rely 255/255, load 1/255
  Encapsulation SNAP, loopback not set, keepalive not set
  ARP type: SNAP, ARP Timeout 04:00:00
  FDX supported, FDX enabled, FDX state is operation
  Phy-A state is maintenance, neighbor is Unknown, status HLS
  Phy-B state is active, neighbor is A, status SILS
  ECM is in, CFM is c_wrap_b, RMT is ring_op,
  Requested token rotation 5000 usec, negotiated 4997 usec
  Configured tvx is 2500 usec
  LER for PortA = 0A, LER for PortB = 0A ring operational 00:02:45
  Upstream neighbor 0060.3e73.4600, downstream neighbor 0060.3e73.4600
  Last input 00:00:12, output 00:00:13, output hang never
  Last clearing of "show interface" counters never
  Queueing strategy: fifo
  Output queue 0/40, 0 drops; input queue 0/75, 0 drops
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
     62 packets input, 6024 bytes, 0 no buffer
     Received 18 broadcasts, 0 runts, 0 giants
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     71 packets output, 4961 bytes, 0 underruns
     0 output errors, 0 collisions, 0 interface resets
     0 output buffer failures, 0 output buffers swapped out
     3 transitions, 0 traces, 100 claims, 0 beacon
```

The table below describes thefields shown in the display.

Table 21: show interfaces fddi Field Descriptions

Field	Description
Fddi is {up | down | administratively down	Gives the interface processor unit number and tells whether the interface hardware is currently active and can transmit and receive or if it has been taken down by an administrator.

Field	Description
line protocol is {up | down}	Indicates whether the software processes that handle the line protocol consider the interface usable.
Hardware	Provides the hardware type, followed by the hardware address.
Internet address	IP address, followed by subnet mask.
MTU	Maximum transmission unit of the interface.
BW	Bandwidth of the interface, in kilobits per second.
DLY	Delay of the interface, in microseconds.
rely	Reliability of the interface as a fraction of 255 (255/255 is 100 percent reliability), calculated as an exponential average over 5 minutes.
load	Load on the interface as a fraction of 255 (255/255 is completely saturated), calculated as an exponential average over 5 minutes.
Encapsulation	Encapsulation method assigned to interface.
loopback	Indicates whether or not loopback is set.
keepalive	Indicates whether or not keepalives are set.
ARP type	Type of Address Resolution Protocol assigned.
FDX	Displays full-duplex information. Values are: not supported or supported. When the value is supported, the display indicates whether full-duplex is enabled or disabled. When enabled, the state of the FDX negotiation process is displayed. The negotiation states only relate to the full-duplex negotiation process. You must also ensure that the interface is up and working by looking at other fields in the **showinterfacesfddi** command such as line protocol and RMT. Negotiation states are: • idle--Interface is working but not in full-duplex mode yet. If persistent, it could mean that the interface did not meet all negotiation conditions (for example, there are more than two stations in the ring). • request--Interface is working but not in full-duplex mode yet. If persistent, it could mean that the remote interface does not support full-duplex or full-duplex is not enabled on the interface. • confirm--Transient state. • operation--Negotiations completed successfully, and both stations are operating in full-duplex mode.
Phy-{A | B}	Lists the state the Physical A or Physical B connection is in; one of the following: off, active, trace, connect, next, signal, join, verify, or break.

Field	Description
neighbor	State of the neighbor: • A--Indicates that the connection management (CMT) process has established a connection with its neighbor. The bits received during the CMT signaling process indicate that the neighbor is a Physical A type dual attachment station (DAS) or concentrator that attaches to the primary ring IN and the secondary ring OUT when attaching to the dual ring. • S--Indicates that the CMT process has established a connection with its neighbor and that the bits received during the CMT signaling process indicate that the neighbor is one Physical type in a single attachment station (SAS). • B--Indicates that the CMT process has established a connection with its neighbor and that the bits received during the CMT signaling process indicate that the neighbor is a Physical B dual attachment station or concentrator that attaches to the secondary ring IN and the primary ring OUT when attaching to the dual ring. • M--Indicates that the CMT process has established a connection with its neighbor and that the bits received during the CMT signaling process indicate that the router's neighbor is a Physical M-type concentrator serving as a Master to a connected station or concentrator. • unk--Indicates that the network server has not completed the CMT process and, as a result, does not know about its neighbor. See the section "Setting Bit Control" for an explanation of the bit patterns.
cmt signal bits	Shows the transmitted/received CMT bits. The transmitted bits are 0x008 for a Physical A type and 0x20C for Physical B type. The number after the slash (/) is the received signal bits. If the connection is not active, the received bits are zero (0); see the line beginning Phy-B in the display. This applies to FIP interfaces only.

Field	Description
status	Status value displayed is the actual status on the fiber. The FDDI standard defines the following values: • LSU--Line State Unknown, the criteria for entering or remaining in any other line state have not been met. • NLS--Noise Line State is entered upon the occurrence of 16 potential noise events without satisfying the criteria for entry into another line state. • MLS--Master Line State is entered upon the receipt of eight or nine consecutive HQ or QH symbol pairs. • ILS--Idle Line State is entered upon receipt of four or five idle symbols. • HLS--Halt Line State is entered upon the receipt of 16 or 17 consecutive H symbols. • QLS--Quiet Line State is entered upon the receipt of 16 or 17 consecutive Q symbols or when carrier detect goes low. • ALS--Active Line State is entered upon receipt of a JK symbol pair when carrier detect is high. • OVUF--Elasticity buffer Overflow/Underflow. The normal states for a connected Physical type are ILS or ALS. If the report displays the QLS status, this indicates that the fiber is disconnected from Physical B, or that it is not connected to another Physical type, or that the other station is not running.
ECM is...	ECM is the SMT entity coordination management, which overlooks the operation of CFM and PCM. The ECM state can be one of the following: • out--Router is isolated from the network. • in--Router is actively connected to the network. This is the normal state for a connected router. • trace--Router is trying to localize a stuck beacon condition. • leave--Router is allowing time for all the connections to break before leaving the network. • path_test--Router is testing its internal paths. • insert--Router is allowing time for the optical bypass to insert. • check--Router is making sure optical bypasses switched correctly. • deinsert--Router is allowing time for the optical bypass to deinsert.

Field	Description
CFM is...	Contains information about the current state of the MAC connection. The Configuration Management state can be one of the following: • isolated--MAC is not attached to any Physical type. • wrap_a--MAC is attached to Physical A. Data is received on Physical A and transmitted on Physical A. • wrap_b--MAC is attached to Physical B. Data is received on Physical B and transmitted on Physical B. • wrap_s--MAC is attached to Physical S. Data is received on Physical S and transmitted on Physical S. This is the normal mode for a single attachment station (SAS). • thru--MAC is attached to Physical A and B. Data is received on Physical A and transmitted on Physical B. This is the normal mode for a dual attachment station (DAS) with one MAC. The ring has been operational for 1 minute and 42 seconds.
RMT is...	RMT (Ring Management) is the SMT MAC-related state machine. The RMT state can be one of the following: • isolated--MAC is not trying to participate in the ring. This is the initial state. • non_op--MAC is participating in ring recovery, and ring is not operational. • ring_op--MAC is participating in an operational ring. This is the normal state while the MAC is connected to the ring. • detect--Ring has been nonoperational for longer than normal. Duplicate address conditions are being checked. • non_op_dup--Indications have been received that the address of the MAC is a duplicate of another MAC on the ring. Ring is not operational. • ring_op_dup--Indications have been received that the address of the MAC is a duplicate of another MAC on the ring. Ring is operational in this state. • directed--MAC is sending beacon frames notifying the ring of the stuck condition. • trace--Trace has been initiated by this MAC, and the RMT state machine is waiting for its completion before starting an internal path test.
token rotation	Token rotation value is the default or configured rotation value as determined by the **fdditoken-rotation-time** command. This value is used by all stations on the ring. The default is 5000 microseconds. For FDDI full-duplex, this indicates the value in use prior to entering full-duplex operation.
negotiated	Actual (negotiated) target token rotation time.
ring operational	When the ring is operational, the displayed value will be the negotiated token rotation time of all stations on the ring. Operational times are displayed by the number of hours:minutes:seconds the ring has been up. If the ring is not operational, the message “ring not operational” is displayed.

Field	Description
Configured tvx	Transmission timer.
LER	Link error rate.
Upstream | downstream neighbor	Displays the canonical MAC address of outgoing upstream and downstream neighbors. If the address is unknown, the value will be the FDDI unknown address (0x00 00 f8 00 00 00).
Last input	Number of hours, minutes, and seconds since the last packet was successfully received by an interface and processed locally on the router. Useful for knowing when a dead interface failed. This counter is updated only when packets are process-switched, not when packets are fast-switched.
output	Number of hours, minutes, and seconds since the last packet was successfully transmitted by an interface. This counter is updated only when packets are process-switched, not when packets are fast-switched.
output hang	Number of hours, minutes, and seconds (or never) since the interface was last reset because of a transmission that took too long. When the number of hours in any of the "last" fields exceeds 24 hours, the number of days and hours is printed. If that field overflows, asterisks are printed.
Last clearing	Time at which the counters that measure cumulative statistics (such as number of bytes transmitted and received) shown in this report were last reset to zero. Note that variables that might affect routing (for example, load and reliability) are not cleared when the counters are cleared. *** indicates the elapsed time is too large to be displayed. 0:00:00 indicates the counters were cleared more than 231 ms (and less than 232 ms) ago.
Queueing strategy	First-in, first-out queueing strategy (other queueing strategies you might see are priority-list, custom-list, and weighted fair).
Output queue, input queue, drops	Number of packets in output and input queues. Each number is followed by a slash, the maximum size of the queue, and the number of packets dropped because of a full queue.
5 minute input rate 5 minute output rate	Average number of bits and packets transmitted per second in the last 5 minutes. The five-minute input and output rates should be used only as an approximation of traffic per second during a given 5-minute period. These rates are exponentially weighted averages with a time constant of 5 minutes. A period of four time constants must pass before the average will be within two percent of the instantaneous rate of a uniform stream of traffic over that period.
packets input	Total number of error-free packets received by the system.
bytes	Total number of bytes, including data and MAC encapsulation, in the error-free packets received by the system.

Field	Description
no buffer	Number of received packets discarded because there was no buffer space in the main system. Compare with ignored count. Broadcast storms on Ethernet networks and bursts of noise on serial lines are often responsible for no input buffer events.
broadcasts	Total number of broadcast or multicast packets received by the interface.
runts	Number of packets that are discarded because they are smaller than the minimum packet size of the media.
giants	Number of packets that are discarded because they exceed the maximum packet size of the medium.
CRC	Cyclic redundancy checksum generated by the originating LAN station or far-end device does not match the checksum calculated from the data received. On a LAN, this usually indicates noise or transmission problems on the LAN interface or the LAN bus itself. A high number of CRCs is usually the result of collisions or a station transmitting bad data.
frame	Number of packets received incorrectly that have a CRC error and a noninteger number of octets. On a LAN, this is usually the result of collisions or a malfunctioning Ethernet device. On an FDDI LAN, this also can be the result of a failing fiber (cracks) or a hardware malfunction.
overrun	Number of times the serial receiver hardware was unable to hand received data to a hardware buffer because the input rate exceeded the receiver's ability to handle the data.
ignored	Number of received packets ignored by the interface because the interface hardware ran low on internal buffers. These buffers are different from the system buffers mentioned previously in the buffer description. Broadcast storms and bursts of noise can cause the ignored count to be increased.
packets output	Total number of messages transmitted by the system.
bytes	Total number of bytes, including data and MAC encapsulation, transmitted by the system.
underruns	Number of transmit aborts (when the router cannot feed the transmitter fast enough).
output errors	Sum of all errors that prevented the final transmission of datagrams out of the interface being examined. Note that this might not balance with the sum of the enumerated output errors, because some datagrams can have more than one error, and others can have errors that do not fall into any of the specifically tabulated categories.
collisions	Because an FDDI ring cannot have collisions, this statistic is always zero.
interface resets	Number of times an interface has been reset. The interface may be reset by the administrator or automatically when an internal error occurs.
restarts	Should always be zero for FDDI interfaces.

Field	Description
output buffer failures	Number of no resource errors received on the output.
output buffers swapped out	Number of packets swapped to DRAM.
transitions	The number of times the ring made a transition from ring operational to ring nonoperational, or vice versa. A large number of transitions indicates a problem with the ring or the interface.
traces	Trace count applies to both the FCI, FCIT, and FIP. Indicates the number of times this interface started a trace.
claims	Pertains to FCIT and FIP only. Indicates the number of times this interface has been in claim state.
beacons	Pertains to FCIT and FIP only. Indicates the number of times the interface has been in beacon state.

The following is sample output that includes the **accounting** option. When you use the **accounting** option, only the accounting statistics are displayed.

```
Router# show interfaces fddi 3/0 accounting
Fddi3/0
       Protocol    Pkts In   Chars In   Pkts Out  Chars Out
             IP       7344    4787842       1803    1535774
      Appletalk      33345    4797459      12781    1089695
        DEC MOP          0          0        127       9779
            ARP          7        420         39       2340
```

The table below describes thefields shown in the display.

*Table 22: **show interfaces fddi** Field Descriptions--Accounting*

Field	Description
Protocol	Protocol that is operating on the interface.
Pkts In	Number of packets received for that protocol.
Chars In	Number of characters received for that protocol.
Pkts Out	Number of packets transmitted for that protocol.
Chars Out	Number of characters transmitted for that protocol.

show interfaces flowcontrol

To display flow-control information, use the **showinterfacesflowcontrol** command in user EXEC or privileged EXEC mode.

show interfaces [*interface* [*mod*]] **flowcontrol** [**module** *number* | **vlan** *vlan*]

Syntax Description

interface	(Optional) Interface type; possible valid values are **ethernet**, **fastethernet**, **gigabitethernet**, **tengigabitethernet**, **port-channel**, **vlan** , **pos**, **atm**, and **ge-wan** **Note** The show interfaces vlan vlan flowcontrol command displays the interface VLAN information.
mod	(Optional) Module and port number.
module *number*	(Optional) Specifies the module number; see the "Usage Guidelines" section for valid values.
vlan **Note** The show interfaces flowcontrol vlan vlan command limits the display to interfaces on the specified VLAN.	(Optional) Limits the display of switch port information to the specified VLAN. Range: 1 to 4094

Command Default

This command has no default settings.

Command Modes

User EXEC Privileged EXEC

Command History

Release	Modification
12.2(14)SX	Support for this command was introduced on the Supervisor Engine 720.
12.2(17d)SXB	Support for this command on the Supervisor Engine 2 was extended to Release 12.2(17d)SXB.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(33)SXI	This command was changed to add the optional **vlan***vlan* keyword and argument.

Usage Guidelines

The **pos**, **atm**, and **ge-wan** keywords are supported on systems that are configured with a Supervisor Engine 2

The *mod*argument designates the module and port number. Valid values for *mod* depend on the chassis and module that are used. For example, if you have a 48-port 10/100BASE-T Ethernet module that is installed in a 13-slot chassis, valid values for the slot number are from 1 to 13 and valid values for the port number are from 1 to 48.

The **module***number* keyword and argument designate the module number and limit the display to interfaces on the module. Valid values depend on the chassis that is used. For example, if you have a 13-slot chassis, valid values for the module number are from 1 to 13.

The port-channel values are from 0 to 282; values from 257 to 282 are supported on the CSM and the FWSM only.

Cisco IOS Release 12.2(33)SXI and later releases allow you to limit the display of switch port information to the specified VLAN.

Examples

This example shows how to display flow-control information for all interfaces:

```
Router> show interfaces flowcontrol
Port  Send    FlowControl Receive FlowControl RxPause TxPause
      admin     oper      admin     oper
----- --------  --------  --------  --------  -------  -------
Gi1/1 desired   off       off       off       0        0
Gi1/2 desired   off       off       off       0        0
Gi3/1 on        on        on        on        0        0
.
.
.
Gi8/2 desired   off       off       off       0        0
Gi8/3 desired   off       off       off       0        0
Gi8/4 desired   off       off       off       0        0
Router>
```

This example shows how to display flow-control information for a specific interface:

```
Router> show interfaces gigabitethernet 8/2 flowcontrol
Port  Send    FlowControl Receive FlowControl RxPause TxPause
      admin     oper      admin     oper
----- --------  --------  --------  --------  -------  -------
Gi8/2 desired   off       off       off       0        0
Router>
```

This example shows how to limit the display flow-control information for interfaces on a specific VLAN:

```
Router> show interfaces flowcontrol vlan 22
Router>
```

The table below describes the fields that are shown in the example.

Table 23: show port flowcontrol Command Output Fields

Field	Description
Port	Interface type and module and port number.
Send admin	Flow-control operation for admin state. Possible settings: on indicates that the local port is allowed to send pause frames to remote ports; off indicates that the local port is prevented from sending pause frames to remote ports; desired indicates predictable results whether a remote port is set to **receiveon**, **receiveoff**, or **receivedesired**.

Field	Description
Send oper	Current flow-control operation. Possible settings: on indicates that the local port is allowed to send pause frames to remote ports; off indicates that the local port is prevented from sending pause frames to remote ports; desired indicates predictable results whether a remote port is set to **receiveon**, **receiveoff**, or **receivedesired**.
Receive admin	Flow-control operation for admin state. Possible settings: on indicates that the local port is allowed to process pause frames that a remote port sends; off indicates that the local port is prevented from sending pause frames to remote ports; desired indicates predictable results whether a remote port is set to **sendon**, **sendoff**, or **senddesired**.
Receive oper	Current flow-control operation. Possible settings: on indicates that the local port is allowed to process pause frames that a remote port sends; off indicates that the local port is prevented from sending pause frames to remote ports; desired indicates predictable results whether a remote port is set to **sendon**, **sendoff**, or **senddesired**.
RxPause	Number of pause frames that are received.
TxPause	Number of pause frames that are transmitted.

Related Commands

Command	Description
flowcontrol	Configures a port to send or receive pause frames.

show interfaces gigabitethernet

To check the status of and configuration settings on a router that supports Gigabit Ethernet Shared Port Adapters (SPA), use the **show interfaces gigabitethernet** command in the privileged EXEC mode.

Cisco 7200 Series Router
show interfaces gigabitethernet *slot/port*

Cisco ASR 1000 Series Aggregation Services Router
show interfaces gigabitethernet *slot/subslot/port*

Syntax Description

slot	Chassis slot number. (Refer to the appropriate hardware manual for slot information. For SPA Interface Processors (SIPs), refer to the platform-specific SPA hardware installation guide or the platform-specific SPA software configuration guide.)
subslot	Secondary slot number on a SIP in which a SPA is installed. (Refer to the platform-specific SPA hardware installation guide or the platform-specific SPA software configuration guide for subslot information.)
port	Port number or interface number. (Refer to the appropriate hardware manual for port information. For SPAs, refer to the platform-specific SPA software configuration guide.)

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
11.1CC	This command was introduced.
12.1(3A)E	The command was modified to support Cisco 7200-I/O-GE+E Controller.
12.1(5)T	This command was integrated into Cisco IOS Release 12.1(5)T.
12.2(14)S	This command was integrated into Cisco IOS Release 12.2(14)S.
12.2(20)S2	This command was integrated into Cisco IOS Release 12.2(20)S2. It was modified to include a new address format and output for the interfaces on the 2-port 10/100/1000 Gigabit Ethernet SPA on the Cisco 7304 Routers. The *subslot* argument was also added.
12.0(31)S	This command was integrated into Cisco IOS Release 12.0(31)S to support the Gigabit Ethernet SPAs on the Cisco 12000 Series Routers.
12.2(18)SXF	This command was integrated into Cisco IOS Release 12.2(18)SXF to support the Gigabit Ethernet SPAs on the Cisco 7600 Series Routers and the Cisco Catalyst 6500 Series Switches.
Cisco IOS XE Release 2.1	This command was implemented on the Cisco ASR 1000 Series Aggregation Services Routers.

Usage Guidelines

This command is used in Cisco 7200-I/O-GE+E Controller and the Cisco ASR 1000 Series Aggregation Services Routers to display the configuration status of a Gigabit Ethernet interface.

Note On Cisco 7200-I/O-GE+E Controller, *slot 0* is always reserved for the Gigabit Ethernet port on the I/O controller.

Cisco 7200-I/O-GE+E Controller Example

The following is sample output from the **show interfaces gigabitethernet** command:

```
Router# show interfaces gigabitethernet 5/1

GigabitEthernet5/1 is up, line protocol is up
Hardware is C6k 1000Mb 802.3, address is 0015.c620.b580 (bia 0015.c620.b580)
  MTU 1500 bytes, BW 1000000 Kbit, DLY 10 usec,
     reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation ARPA, loopback not set
  Keepalive set (10 sec)
  Full-duplex, 1000Mb/s
  input flow-control is off, output flow-control is off
  Clock mode is auto
  ARP type: ARPA, ARP Timeout 04:00:00
  Last input never, output never, output hang never
  Last clearing of "show interface" counters never
  Input queue: 0/75/0/0 (size/max/drops/flushes); Total output drops: 0
  Queueing strategy: fifo
  Output queue: 0/40 (size/max)
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
     0 packets input, 0 bytes, 0 no buffer
     Received 0 broadcasts (0 IP multicasts)
     0 runts, 0 giants, 0 throttles
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored
     0 watchdog, 0 multicast, 0 pause input
     0 input packets with dribble condition detected
     0 packets output, 0 bytes, 0 underruns
     0 output errors, 0 collisions, 1 interface resets
     0 babbles, 0 late collision, 0 deferred
     0 lost carrier, 0 no carrier, 0 pause output
     0 output buffer failures, 0 output buffers swapped out
```

Cisco ASR 1000 Series Aggregation Services Router Example

The following is sample output from the **show interfaces gigabitethernet** command:

```
Router# show interface gigabitethernet 0/0/0

GigabitEthernet0/0/0 is up, line protocol is up
  Hardware is SPA-2X1GE-V2, address is 001f.6c25.c400 (bia 001f.6c25.c400)
  Description: Connected to CE28_C2811 GE 0/0/0
  Internet address is 192.168.128.43/24
  MTU 2000 bytes, BW 1000000 Kbit/sec, DLY 10 usec,
     reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation ARPA, loopback not set
  Keepalive not supported
  Full Duplex, 1000Mbps, link type is auto, media type is SX
  output flow-control is on, input flow-control is on
  ARP type: ARPA, ARP Timeout 04:00:00
  Last input 00:00:46, output 00:09:07, output hang never
```

```
  Last clearing of "show interface" counters never
  Input queue: 0/375/0/0 (size/max/drops/flushes); Total output drops: 0
  Queueing strategy: fifo
  Output queue: 0/40 (size/max)
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
     673295 packets input, 70811204 bytes, 0 no buffer
     Received 1 broadcasts (0 IP multicasts)
     0 runts, 0 giants, 0 throttles
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored
     0 watchdog, 104296 multicast, 0 pause input
     1310016 packets output, 99574303 bytes, 0 underruns
     0 output errors, 0 collisions, 2 interface resets
     0 unknown protocol drops
     0 babbles, 0 late collision, 0 deferred
     0 lost carrier, 0 no carrier, 0 pause output
     0 output buffer failures, 0 output buffers swapped out
```

Gigabit Ethernet SPA Example

The following is sample output from the **show interfaces gigabitethernet** command for the first interface *port 0* in a 2-port 10/100/1000 Gigabit Ethernet SPA located in the top *subslot 0* of the MSC that is installed in *slot 4* on a Cisco 7304 Router:

```
Router# show interfaces gigabitethernet 4/0/0

GigabitEthernet4/0/0 is up, line protocol is down
  Hardware is SPA-2GE-7304, address is 00b0.64ff.5a80 (bia 00b0.64ff.5a80)
  MTU 1500 bytes, BW 1000000 Kbit, DLY 10 usec,
     reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation ARPA, loopback not set
  Keepalive set (10 sec)
  Half-duplex, 1000Mb/s, link type is auto, media type is RJ45
  output flow-control is unsupported, input flow-control is unsupported
  ARP type: ARPA, ARP Timeout 04:00:00
  Last input never, output 00:00:09, output hang never
  Last clearing of "show interface" counters never
  Input queue: 0/75/0/0 (size/max/drops/flushes); Total output drops: 0
  Queueing strategy: fifo
  Output queue: 0/40 (size/max)
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
     0 packets input, 0 bytes, 0 no buffer
     Received 0 broadcasts (0 IP multicast)
     0 runts, 0 giants, 0 throttles
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored
     0 watchdog, 0 multicast, 0 pause input
     109 packets output, 6540 bytes, 0 underruns
     0 output errors, 0 collisions, 2 interface resets
     0 babbles, 0 late collision, 0 deferred
     1 lost carrier, 0 no carrier, 0 PAUSE output
     0 output buffer failures, 0 output buffers swapped out
```

Note There will be variations in the output of the **show interfaces** command, depending on the platform, type of interface, and other features that you might have configured, such as Quality of Service (QoS). Therefore, some additional output fields might appear in your **show interfaces** command output. For more information about these fields, see the **show interfaces** command description in the *Cisco IOS Interface and Hardware Component Command Reference* document at: http://www.cisco.com/en/US/docs/ios-xml/ios/interface/command/ir-s4.html#wp2987586133

The following table describes the significant fields shown in the displays:

Table 24: show interfaces gigabitethernet Field Descriptions

Field	Description
GigabitEthernet...is up ...is administratively down	Indicates whether the interface hardware is currently active or if it has been taken down by an administrator.
line protocol is	Indicates whether the software processes that handle the line protocol consider the line usable, or if it has been taken down by an administrator.
Hardware	Hardware type, for example, SPA-2GE-7304, and MAC address.
Description	Alphanumeric string identifying the interface. It is displayed only if the **description** interface configuration command has been configured on the interface.
Internet address	Internet address followed by the subnet mask.
MTU	Maximum transmission unit of the interface. The default is 1500 bytes for the 2-port 10/100/1000 Gigabit Ethernet SPA.
BW	Bandwidth of the interface, in kilobits, per second.
DLY	Delay in the interface, in microseconds.
reliability	Reliability of the interface as a fraction of 255 (255/255 is 100 percent reliability), calculated as an exponential average over 5 minutes.
txload, rxload	Load on the interface (in the transmit “tx” and receive “rx” directions) as a fraction of 255 (255/255 is completely saturated), calculated as an exponential average over 5 minutes.
Encapsulation	Encapsulation method assigned to the interface.
loopback	Indicates whether or not loopback is set.
Keepalive	Indicates whether or not keepalives are set, and the time interval.
Half-duplex, Full-duplex	Indicates the duplex mode of the interface.
1000Mb/s, 100Mb/s, 10Mb/s	Speed of the interface, in megabits, per second.
link type	Specifies whether or not auto negotiation is being used on the link.
media type	Interface port media type: RJ45, SX, LX, or ZX.
ARP type	Type of Address Resolution Protocol (ARP) assigned, and the timeout period.
Last input	Number of hours, minutes, and seconds since the last packet was successfully received by the interface and processed locally on a router. Useful for knowing when a dead interface failed. This field is not updated by fast-switched traffic.

Field	Description
output	Number of hours, minutes, and seconds since the last packet was successfully transmitted by the interface. Useful for knowing when a dead interface failed.
output hang	Number of hours, minutes, and seconds (or never) since the interface was last reset because of a transmission that took too long. When the number of hours in any of the "last" fields exceeds 24 hours, the number of days and hours is displayed. If that field overflows, asterisks are displayed. **Note** This field does not apply to the SPA interfaces.
Last clearing	Time at which the counters that measure cumulative statistics (such as number of bytes transmitted and received) shown in the report were last reset to zero. Note that variables that might affect routing (for example, load and reliability) are not cleared when the counters are cleared. A series of asterisks (***) indicates that the elapsed time is too large to be displayed. 0:00:00 indicates that the counters were cleared more than 231 ms (and less than 232 ms) ago.
Input queue (size/max/drops/flushes)	Packet statistics on the input queue are reported as: • Size—Number of packets in the input queue. • Max—Maximum size of the queue. • Drops—Number of packets dropped because of a full input queue. • Flushes—Number of packets dropped as part of selective packet discard (SPD). SPD implements a selective packet drop policy on a router's IP process queue. Therefore, it only applies to process-switched traffic.
Total output drops	Total number of packets dropped because of a full output queue.
Queueing strategy	Type of Layer 3 queueing active on this interface. The default is first-in, first-out (FIFO).
Output queue (size/max)	Number of packets in the output queue (size), and the maximum size of the queue (max).
5 minute input rate, 5 minute output rate	Average number of bits and packets transmitted per second in the last 5 minutes. If the interface is not in the promiscuous mode, it senses the network traffic it sends and receives (rather than all the network traffic). The 5-minute input and output rates should be used only as an approximation of traffic per second during a given 5-minute period. These rates are exponentially weighted averages with a time constant of 5 minutes. A period of four time constants must pass before the average can be within two percent of the instantaneous rate of a uniform stream of traffic over that period.
packets input	Total number of error-free packets received by the system.

Field	Description
bytes	Total number of bytes, including data and MAC encapsulation, in the error-free packets received by the system.
Received...broadcasts	Total number of broadcast or multicast packets received by the interface.
runts	Number of packets that are discarded because they are smaller than the minimum packet size of the medium. For instance, any Ethernet packet that is smaller than 64 bytes is considered a runt.
giants	Number of packets that are discarded because they exceed the maximum packet size of the medium. For example, any Ethernet packet that is larger than 1536 bytes is considered a giant. **Note** In the 2-port 10/100/1000 Gigabit Ethernet SPA, the default is that a giant is any packet greater than 1536 bytes. However, if you modify the maximum transmission unit (MTU) for the interface, this counter increments when you exceed the specified MTU for the interface.
throttles	Number of times the receiver on the port was disabled, possibly because of buffer or processor overload.
input errors	Includes runts, giants, no buffer, cyclic redundancy check (CRC), frame, overrun, oversubscription counters, and ignored counts. Other input-related errors can also cause the input errors count to be increased, and some datagrams may have more than one error. Therefore, this sum may not balance with the sum of enumerated input error counts. **Note** The oversubscription counters are included only on the Cisco ASR 1000 Series Aggregation Services Routers.
CRC	Cyclic redundancy check generated by the originating LAN station or far-end device does not match the checksum calculated from the data received. On a LAN, this usually indicates noise or transmission problems on the LAN interface or the LAN bus itself. A high number of CRCs is usually the result of collisions or a station transmitting bad data.
frame	Number of packets received incorrectly having a CRC error and a noninteger number of octets. On a LAN, this is usually the result of collisions or a malfunctioning Ethernet device.
overrun	Number of times the receiver hardware was unable to hand the received data to a hardware buffer because the input rate exceeded the receiver's ability to handle the data. The overrun also includes the interface oversubscription counters. **Note** The interface oversubscription counters are included only on the Cisco ASR 1000 Series Aggregation Services Routers.

Field	Description
ignored	Number of received packets ignored by the interface because the interface hardware is running low on internal buffers. These buffers are different from the system buffers. Broadcast storms and bursts of noise may cause the ignored count to be increased.
watchdog	Number of times the watchdog receive timer expires. Expiration occurs when receiving a packet with a length that is greater than 2048 bytes.
input packets with dribble condition detected	Dribble bit error indicates that a frame is slightly longer than usual. This frame error counter is incremented for informational purposes only; the router accepts the frame.
packets output	Total number of messages transmitted by the system.
bytes	Total number of bytes, including data and MAC encapsulation, transmitted by the system.
underruns	Number of times the transmitter has been running faster than the speed a router can handle.
output errors	Sum of all the errors that prevented the final transmission of datagrams out of the interface being examined. Note that this may not balance with the sum of the enumerated output errors because some datagrams may have more than one error and others may have errors that do not fall into any of the specifically tabulated categories.
collisions	Number of messages retransmitted because of an Ethernet collision. This is usually the result of an overextended LAN, for example, an Ethernet or transceiver cable that is too long, more than two repeaters between stations, or too many cascaded multiport transceivers. A packet that collides is counted only once in output packets.
interface resets	Number of times an interface is completely reset. This may occur if packets that are queued for transmission were not sent within several seconds. Interface resets may occur when an interface is looped back or shut down.
babbles	Transmit jabber timer expired.
late collision	Number of late collisions. Late collision occurs when a collision takes place after the preamble is transmitted.
deferred	Number of times the interface had to defer while ready to transmit a frame because the carrier was asserted.
lost carrier	Number of times the carrier was lost during transmission.
no carrier	Number of times the carrier was not present during the transmission. **Note** This field does not apply to SPA interfaces.

Field	Description
output buffer failures, output buffers swapped out	These counters are not used by the 2-port 10/100/1000 Gigabit Ethernet SPA on the Cisco 7304 Routers.

Related Commands

Command	Description
show controllers gigabitethernet	Displays Gigabit Ethernet interface information, transmission statistics and errors, and applicable MAC destination address and VLAN filtering tables.
show interfaces	Displays the statistics for the interfaces configured on a router, switch, or access server.

show interfaces hssi

To display information about the high-speed serial interface (HSSI), use the **showinterfaceshssi**command in privileged EXEC mode.

Standard Syntax
show interfaces hssi *number* [**accounting**]

Cisco 7500 Series
show interfaces hssi [*slot*/*port*] [**accounting**]

Syntax Description

number	Port number on the selected interface.
accounting	(Optional) Displays the number of packets of each protocol type that have been sent through the interface.
slot	(Optional) Slot number. Refer to the appropriate hardware manual for slot and port information.
port	(Optional) Port number. Refer to the appropriate hardware manual for slot and port information.

Command Modes

Privileged EXEC

Command History

Release	Modification
10.0	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Examples

The following is sample output from the **showinterfaceshssi** command when HSSI is enabled:

```
Router# show interfaces hssi 0
HSSI 0 is up, line protocol is up
 Hardware is cBus HSSI
 Internet address is 10.136.67.190, subnet mask is 255.255.255.0
 MTU 4470 bytes, BW 45045 Kbit, DLY 20000 usec, rely 255/255, load 1/255
 Encapsulation HDLC, loopback not set, keepalive set (10 sec)
 Last input 0:00:03, output 0:00:00, output hang never
 Output queue 0/40, 0 drops; input queue 0/75, 0 drops
 Five minute input rate 0 bits/sec, 0 packets/sec
 Five minute output rate 0 bits/sec, 0 packets/sec
      0 packets input, 0 bytes, 0 no buffer
      Received 0 broadcasts, 0 runts, 0 giants
               0 parity, 0 rx disabled
 0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
 17 packets output, 994 bytes, 0 underruns
 0 output errors, 0 applique, 4 interface resets, 0 restarts
 2 carrier transitions
```

The table below describes significant fields shown in the display.

Table 25: ***show interfaces hssi*** *Field Descriptions*

Field	Description
HSSI is {up | down | administratively down}	Indicates whether the interface hardware is currently active (whether carrier detect is present) and whether it has been taken down by an administrator. “Disabled” indicate that the router has received over 5000 errors in a keepalive interval, which is 10 seconds by default.
line protocol is {up | down | administratively down}	Indicates whether the software processes that handle the line protocol consider the line usable (that is, whether keepalives are successful).
Hardware	Specifies the hardware type.
Internet address	Lists the Internet address followed by subnet mask.
MTU	Maximum transmission unit of the interface.
BW	Bandwidth of the interface, in kilobits per second.
DLY	Delay of the interface, in microseconds.
rely	Reliability of the interface as a fraction of 255 (255/255 is 100 percent reliability), calculated as an exponential average over 5 minutes.
load	Load on the interface as a fraction of 255 (255/255 is completely saturated), calculated as an exponential average over 5 minutes.
Encapsulation	Encapsulation method assigned to interface.
loopback	Indicates whether loopback is set and type of loopback test.
keepalive	Indicates whether keepalives are set or not.
Last input	Number of hours, minutes, and seconds since the last packet was successfully received by an interface and processed locally on the router. Useful for knowing when a dead interface failed. This counter is updated only when packets are process-switched, not when packets are fast-switched.
Last output	Number of hours, minutes, and seconds since the last packet was successfully transmitted by an interface. This counter is updated only when packets are process-switched, not when packets are fast-switched.
output hang	Number of hours, minutes, and seconds (or never) since the interface was last reset because of a transmission that took too long. When the number of hours in any of the “last” fields exceeds 24 hours, the number of days and hours is printed. If that field overflows, asterisks are printed.

Field	Description
Last clearing	Time at which the counters that measure cumulative statistics (such as number of bytes transmitted and received) shown in this report were last reset to zero. Note that variables that might affect routing (for example, load and reliability) are not cleared when the counters are cleared. *** indicates the elapsed time is too large to be displayed. 0:00:00 indicates the counters were cleared more than 231 ms (and less than 232 ms) ago.
Output queue, drops Input queue, drops	Number of packets in output and input queues. Each number is followed by a slash, the maximum size of the queue, and the number of packets dropped because of a full queue.
Five minute input rate, Five minute output rate	Average number of bits and packets transmitted per second in the last 5 minutes.
packets input	Total number of error-free packets received by the system.
bytes input	Total number of bytes, including data and MAC encapsulation, in the error-free packets received by the system.
no buffer	Number of received packets discarded because there was no buffer space in the main system. Compare with ignored count. Broadcast storms on Ethernet networks and bursts of noise on serial lines are often responsible for no input buffer events.
broadcasts	Total number of broadcast or multicast packets received by the interface.
runts	Number of packets that are discarded because they are smaller than the minimum packet size of the medium.
giants	Number of packets that are discarded because they exceed the maximum packet size of the medium.
parity	Report of the parity errors on the HSSI.
rx disabled	Indicates that the HSSI could not find a free buffer on the ciscoBus controller to reserve for use for the HSSI receiver. When this happens, the HSSI shuts down its receiver and waits until a buffer is available. Data is not lost unless a packet comes in and overflows the HSSI FIFO. Usually, the receive disables are frequent but do not last for long, and the number of dropped packets is less than the count in the “rx disabled” field. A receive disabled condition can happen in systems that are under heavy traffic load and that have shorter packets. In this situation, the number of buffers available on the ciscoBus controller is at a premium. One way to alleviate this problem is to reduce the maximum transmission unit (MTU) on the HSSI interface from 4500 (FDDI size) to 1500 (Ethernet size). Doing so allows the software to take the fixed memory of the ciscoBus controller and divide it into a larger number of smaller buffers, rather than a small number of large buffers. Receive disables are not errors, so they are not included in any error counts.

Field	Description
input errors	Sum of all errors that prevented the receipt of datagrams on the interface being examined. This may not balance with the sum of the enumerated output errors, because some datagrams may have more than one error and others may have errors that do not fall into any of the specifically tabulated categories.
CRC	Cyclic redundancy checksum (CRC) generated by the originating LAN station or far-end device does not match the checksum calculated from the data received. On a LAN, this usually indicates noise or transmission problems on the LAN interface or the LAN bus itself. A high number of CRCs is usually the result of collisions or a station transmitting bad data. On a serial link CRCs usually indicate noise, gain hits, or other transmission problems on the data link. CRC errors are also reported when a far-end abort occurs, and when the idle flag pattern is corrupted. This makes it possible to get CRC errors even when there is no data traffic.
frame	Number of packets received incorrectly having a CRC error and a noninteger number of octets. On a serial line, this is usually the result of noise or other transmission problems.
overrun	Number of times the serial receiver hardware was unable to hand received data to a hardware buffer because the input rate exceeded the ability of the receiver to handle the data.
ignored	Number of received packets ignored by the interface because the interface hardware ran low on internal buffers. These buffers are different than the system buffers mentioned previously in the buffer description. Broadcast storms and bursts of noise can cause the ignored count to be increased.
abort	Number of packets whose receipt was aborted.
packets output	Total number of messages transmitted by the system.
bytes output	Total number of bytes, including data and MAC encapsulation, transmitted by the system.
underruns	Number of times that the far-end transmitter has been running faster than the near-end router receiver can handle.
congestion drop	Number of messages discarded because the output queue on an interface grew too long. This can happen on a slow, congested serial link.
output errors	Sum of all errors that prevented the final transmission of datagrams out of the interface being examined. Note that this may not balance with the sum of the enumerated output errors, because some datagrams may have more than one error, and others may have errors that do not fall into any of the specifically tabulated categories.
applique	Indicates that an unrecoverable error has occurred on the High-System Availability (HSA) applique. The system then invokes an interface reset.

Field	Description
interface resets	Number of times that an interface has been completely reset. This can happen if packets queued for transmission were not sent within several seconds time. On a serial line, this can be caused by a malfunctioning modem that is not supplying the transmit clock signal or by a cable problem. If the system notices that the carrier detect line of a serial interface is up, but the line protocol is down, it periodically resets the interface in an effort to restart it. Interface resets can also occur when an interface is looped back or shut down.
restarts	Number of times that the controller was restarted because of errors.
carrier transitions	Number of times that the carrier detect signal of the interface has changed state. Indicates modem or line problems if the carrier detect line is changing state often.

The following is sample output from the **showinterfaceshssi** command on a Cisco 7500 series router:

```
Router# show interfaces hssi 1/0
Hssi1/0 is up, line protocol is up
  Hardware is cxBus HSSI
  Internet address is 10.108.38.14, subnet mask is 255.255.255.0
  MTU 1500 bytes, BW 45045 Kbit, DLY 1000000 usec, rely 255/255, load 1/255
  Encapsulation HDLC, loopback not set, keepalive set (10 sec)
  Last input 0:00:00, output 0:00:08, output hang never
  Last clearing of "show interface" counters never
  Output queue 0/40, 0 drops; input queue 0/75, 0 drops
  Five minute input rate 1000 bits/sec, 2 packets/sec
  Five minute output rate 0 bits/sec, 0 packets/sec
     630573548 packets input, 2077237628 bytes, 0 no buffer
     Received 2832063 broadcasts, 0 runts, 0 giants
              0 parity, 1970 rx disabled
     113 input errors, 20 CRC, 93 frame, 0 overrun, 0 ignored, 0 abort
     629721628 packets output, 1934313295 bytes, 0 underruns
     0 output errors, 0 applique, 62 interface resets, 0 restarts
     309 carrier transitions
```

The following is sample output from the **showinterfaceshssi** command with the **accounting** option on a Cisco 7500 series router:

```
Router# show interfaces hssi 1/0 accounting
HIP1/0
       Protocol    Pkts In   Chars In   Pkts Out  Chars Out
             IP       7344    4787842       1803    1535774
      Appletalk      33345    4797459      12781    1089695
        DEC MOP          0          0        127       9779
            ARP          7        420         39       2340
```

The table below describes thefields shown in the display.

*Table 26: **show interfaces hssi** Field Descriptions--Accounting*

Field	Description
Protocol	Protocol that is operating on the interface.
Pkts In	Number of packets received for that protocol.
Chars In	Number of characters received for that protocol.

Field	Description
Pkts Out	Number of packets transmitted for that protocol.
Chars Out	Number of characters transmitted for that protocol.

show interfaces integrated-service-engine

To show the Cisco wireless LAN controller network module (WLCM) interfaces on the router, use the **showinterfacesintegrated-service-engine** command in privileged EXEC mode.

show interfaces integrated-service-engine slot/unit {**aaa** | **accounting** | **counters** | **crb** | **dampening** | **description** | **etherchannel** | **irb** | **mac-accounting** | **mpls-exp** | **precedence** | **pruning** | **rate-limit** | **stats** | **status** | **summary** | **switching** | **switchport** | **trunk**}

Syntax Description

slot/unit	Specifies the router slot and unit numbers.
aaa	Shows the dot11 aaa information.
accounting	Shows the interface accounting information.
counters	Shows the interface counters.
crb	Shows the interface routing and bridging information.
dampening	Shows the interface dampening information.
description	Shows the interface description.
etherchannel	Shows the interface Ethernet channel information.
irb	Shows the interface routing and bridging information.
mac-accounting	Shows the interface MAC accounting information.
mpls-exp	Shows the interface MPLS experimental accounting information.
precedence	Shows the interface precedence accounting information.
pruning	Shows the interface trunk VTP pruning information.
rate-limit	Shows the interface rate-limit information.
stats	Shows the interface in and out packets and octets by switching path.
status	Shows the interface line status.
summary	Shows the interface summary.
switching	Shows the interface switching.
switchport	Shows the interface switchport information.
trunk	Shows the interface trunk information.

Command Default

None

Command Modes

Privileged EXEC

Command History

Release	Modification
12.4(15)T	This command was introduced.

Examples

The following example shows how to read the interface information about the WLCM in the router:

```
Router# show interfaces integrated-service-engine
 1/0
integrated-service-engine 1/0 is up, line protocol is up
  Hardware is I82559FE, address is 0005.9a3d.7450 (bia 0005.9a3d.7450)
  Internet address is 30.0.0.1/24
  MTU 1500 bytes, BW 100000 Kbit, DLY 100 usec,
     reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation 802.1Q Virtual LAN, Vlan ID  1., loopback not set
  Keepalive set (10 sec)
  Full-duplex, 100Mb/s, 100BaseTX/FX
  ARP type: ARPA, ARP Timeout 04:00:00
  Last input 00:00:05, output 00:00:03, output hang never
  Last clearing of "show interface" counters never
  Input queue: 0/75/0/0 (size/max/drops/flushes); Total output drops: 0
  Queueing strategy: fifo
  Output queue: 0/40 (size/max)
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
     2400779 packets input, 143127299 bytes
     Received 2349587 broadcasts, 0 runts, 0 giants, 0 throttles
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored
     0 watchdog
     0 input packets with dribble condition detected
     468232 packets output, 106333102 bytes, 0 underruns
     0 output errors, 0 collisions, 3 interface resets
     0 babbles, 0 late collision, 0 deferred
     0 lost carrier, 1 no carrier
     0 output buffer failures, 0 output buffers swapped out
```

Related Commands

interface integrated-service-engine

show interfaces ism

To display status, traffic data, and configuration information about the internal service module (ISM) interface, use the **showinterfacesism** command in user EXEC or privileged EXEC mode.

show interfaces ism *slot/port*

Syntax Description

slot	Router slot in which the service module is installed. For internal service modules, always use 0.
/ *port*	Port number of the module interface. The slash mark (/) is required.

Command Modes

User EXEC (>) Privileged EXEC (#)

Command History

Release	Modification
15.0(1)M	This command was introduced.

Usage Guidelines

The ISM interface is the Gigabit Ethernet interface on the router that connects to the ISM.

Examples

The following example displays status, traffic data, and configuration information about the interface to the ISM installed in the router.

```
Router# show interfaces ism 0/0
ISM0/0 is up, line protocol is up
  Hardware is PSE2, address is 001e.4a97.646d (bia 001e.4a97.646d)
  Internet address is 20.0.0.1/24
  MTU 1500 bytes, BW 1000000 Kbit/sec, DLY 10 usec,
     reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation ARPA, loopback not set
  Keepalive set (10 sec)
  Full-duplex, 1000Mb/s, media type is internal
  output flow-control is XON, input flow-control is XON
  ARP type: ARPA, ARP Timeout 04:00:00
  Last input 00:00:11, output 00:00:11, output hang never
  Last clearing of "show interface" counters never
  Input queue: 0/75/0/0 (size/max/drops/flushes); Total output drops: 0
  Queueing strategy: fifo
  Output queue: 0/60 (size/max)
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
     329 packets input, 34641 bytes, 0 no buffer
     Received 109 broadcasts, 0 runts, 0 giants, 0 throttles
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored
     0 watchdog, 0 multicast, 0 pause input
     0 input packets with dribble condition detected
     241 packets output, 79646 bytes, 0 underruns
     0 output errors, 0 collisions, 0 interface resets
     0 unknown protocol drops
     0 unknown protocol drops
     0 babbles, 0 late collision, 0 deferred
     0 lost carrier, 0 no carrier, 0 pause output
     0 output buffer failures, 0 output buffers swapped out
```

The table below describes the significant fields shown in the display.

Table 27: show interfaces ism Field Descriptions

Field	Description
Hardware, address	Hardware type and address.
MTU	Maximum transmission unit (MTU) of the service module interface.
BW	Bandwidth of the interface, in kbps.
DLY	Delay of the interface, in microseconds.
reliability	Reliability of the interface as a fraction of 255 (255/255 is 100 percent reliability), calculated as an exponential average over 5 minutes.
txload	Transmit load on the interface as a fraction of 255 (255/255 is completely saturated), calculated as an exponential average over 5 minutes.
rxload	Receive load on the interface as a fraction of 255 (255/255 is completely saturated), calculated as an exponential average over 5 minutes.
Encapsulation	Encapsulation method assigned to the interface.
loopback	Indicates whether or not loopback is set.
Keepalive	Indicates whether or not keepalives are set and the interval between keepalives if they have been set.
ARP type...ARP Timeout	Type of Address Resolution Protocol (ARP) assigned and length of timeout.
Last input	Number of hours, minutes, and seconds since the last packet was successfully received by the interface and processed locally on the router. This field is useful for detecting when a dead interface failed. **Note** This field is not updated by fast-switched traffic.
output	Number of hours, minutes, and seconds since the last packet was successfully transmitted by the interface. This field is useful for detecting when a dead interface failed.
output hang	Number of hours, minutes, and seconds (or never) since the interface was last reset because a transmission took too long. When the number of hours in any of the “last” fields exceeds 24 hours, the number of days and hours is printed. If that field overflows, asterisks are printed.
Last clearing	Time at which the counters that measure cumulative statistics (such as number of bytes transmitted and received) shown in this report were last reset to zero. Note that variables that might affect routing (for example, load and reliability) are not cleared when the counters are cleared. Asterisks (***) indicate that the elapsed time is too large to be displayed.

Field	Description
Input queue	Number of packets in the input queue. Each number is followed by a slash, the maximum size of the queue, the number of packets dropped because of a full queue, and the number of times that queued packets have been discarded.
Total output drops	Number of packets in the output queue that have been dropped because of a full queue.
Queueing strategy	Queueing strategy applied to the interface, which is configurable under the interface. The default is FIFO (first-in, first-out).
Output queue	Number of packets in the output queue, and the maximum size of the queue. Each number is followed by a slash.
5 minute input rate, 5 minute output rate	Average number of bits and packets transmitted per second in the last 5 minutes. If the interface is not in promiscuous mode, it senses network traffic that it sends and receives (rather than all network traffic). The 5-minute input and output rates should be used only as an approximation of traffic per second during a given 5-minute period. These rates are exponentially weighted averages with a time constant of 5 minutes. A period of four time constants must pass before the average will be within 2 percent of the instantaneous rate of a uniform stream of traffic over that period. **Note** The 5-minute period referenced in this output is a load interval that is configurable under the interface. The default value is 5 minutes.
packets input	Total number of error-free packets received by the system.
bytes	Total number of bytes, including data and MAC encapsulation, in the error-free packets received by the system.
no buffer	Number of received packets discarded because there was no buffer space in the main system. Compare with ignored count. Broadcast storms on Ethernets and bursts of noise on serial lines are often responsible for no input buffer events.
Received...broadcasts	Number of broadcasts received.
runts	Number of packets that are discarded because they are smaller than the minimum packet size of the medium. For instance, any Ethernet packet that is less than 64 bytes is considered a runt.
giants	Number of packets that are discarded because they exceed the maximum packet size of the medium. For example, any Ethernet packet that is greater than 1518 bytes is considered a giant.
throttles	Number of times that the interface requested another interface within the router to slow down.

Field	Description
input errors	Errors that include runts, giants, no buffer, cyclic redundancy checksum (CRC), frame, overrun, and ignored counts. Other input-related errors can also cause the input errors count to be increased, and some datagrams may have more than one error; therefore, this sum may not balance with the sum of enumerated input error counts.
CRC	Errors created when the CRC generated by the originating LAN station or far-end device does not match the checksum calculated from the data received. On a LAN, this usually indicates noise or transmission problems on the LAN interface or the LAN bus itself. A high number of CRCs is usually the result of collisions or a station that is transmitting bad data.
frame	Number of packets received incorrectly that have a CRC error and a noninteger number of octets. On a LAN, this is usually the result of collisions or a malfunctioning Ethernet device.
overrun	Number of times that the receiver hardware was unable to hand received data to a hardware buffer because the input rate exceeded the receiver's ability to handle the data.
ignored	Number of received packets that were ignored by the interface because the interface hardware ran low on internal buffers. These buffers are different from system buffer space described. Broadcast storms and bursts of noise can cause the ignored count to increase.
input packets with dribble condition detected	Number of packets with dribble condition. Dribble bit error indicates that a frame is slightly too long. This frame error counter is incremented just for informational purposes; the router accepts the frame.
packets output	Total number of messages that have been transmitted by the system.
bytes	Total number of bytes, including data and MAC encapsulation, that have been transmitted by the system.
underruns	Number of times that the transmitter has run faster than the router could handle. This may never be reported on some interfaces.
output errors	Sum of all errors that prevented the final transmission of datagrams out of the interface that is being examined. Note that this may not balance with the sum of the enumerated output errors, because some datagrams may have more than one error, and others may have errors that do not fall into any of the specifically tabulated categories.
collisions	Number of messages that have been retransmitted because of an Ethernet collision. This is usually the result of an overextended LAN (Ethernet or transceiver cable too long, more than two repeaters between stations, or too many cascaded multiport transceivers). A packet that collides is counted only once in output packets.

Field	Description
interface resets	Number of times an interface has been completely reset. This can happen if packets that were queued for transmission were not sent within several seconds. On a serial line, this can be caused by a malfunctioning modem that is not supplying the transmit clock signal or by a cable problem. If the system notices that the carrier detect line of a serial interface is up, but the line protocol is down, it periodically resets the interface in an effort to restart it. Interface resets can also occur when an interface is looped back or shut down.
babbles	Count of frames greater than 1518 bytes that have been transmitted, indicating that the transmitter has been on the interface longer than the time necessary to transmit the largest frame.
late collision	Number of late collisions. A collision becomes a late collision when it occurs after the preamble has been transmitted.
deferred	Deferred indicates that the chip, while ready to transmit a frame, had to defer because the carrier was asserted.
lost carrier	Number of times that the carrier was lost during transmission.
no carrier	Number of times that the carrier was not present during the transmission.
output buffer failures, output buffers swapped out	Number of failed buffers and number of buffers swapped out.

Related Commands

Command	Description
show controllers ism	Displays controller information for the service module interface.

show interfaces lex

To display statistics about a LAN Extender interface, use the **showinterfaceslex** command in EXEC mode.

show interfaces lex commandshow interfaces lex *number* [**ethernet** | **serial**]

Syntax Description

number	Number of the LAN Extender interface that resides on the core router about which to display statistics.
ethernet	(Optional) Displays statistics about the Ethernet interface that resides on the LAN Extender chassis.
serial	(Optional) Displays statistics about the serial interface that resides on the LAN Extender chassis.

Command Modes

EXEC

Command History

Release	Modification
10.3	This command was introduced.
12.2(15)T	This command is no longer supported in Cisco IOS Mainline or Technology-based releases. It may conintue to appear in Cisco IOS 12.2S-family releases.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines

To display statistics about the LAN Extender interface on the core router, use the **showinterfaceslex** command without any keywords.

Administratively, the physical serial interface that connects the core router to the LAN Extender is completely hidden. The **showinterfacesserial**command will show only that the serial interface is present. However, it will not report any statistics about the traffic passing over the physical line. All statistics are report by the **showinterfaceslex** command.

Examples

The following is sample output from the **showinterfaceslex** command, showing the LAN Extender interface on the host router. Note the "Bound to ..." field, which is displayed only on a LAN Extender interface.

```
Router# show interfaces lex 0
Lex0 is up, line protocol is up
  Hardware is Lan Extender, address is 0204.0301.1526 (bia 0000.0000.0000)
  MTU 1500 bytes, BW 10000 Kbit, DLY 20000 usec, rely 255/255, load 1/255
  Encapsulation ARPA, loopback not set
  ARP type: ARPA, ARP Timeout 4:00:00
  Bound to Serial3
  Last input never, output never, output hang never
  Last clearing of "show interface" counters never
  Output queue 0/40, 0 drops; input queue 0/75, 0 drops
  Five minute input rate 1000 bits/sec, 0 packets/sec
```

```
  Five minute output rate 0 bits/sec, 0 packets/sec
     1022 packets input, 0 bytes, 0 no buffer
     Received 0 broadcasts, 0 runts, 0 giants
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     2070 packets output, 23663 bytes, 0 underruns
     0 output errors, 0 collisions, 0 interface resets, 0 restarts
```

The following is sample output from the **showinterfaceslex** command when you specify the **ethernet** keyword:

```
Router# show interfaces lex 0 ethernet
Lex0-Ethernet0 is up, line protocol is up
  Hardware is LAN-Extender, address is 0000.0c01.1526 (bia 0000.0c01.1526)
  Last input 6w3d, output 6w3d
  Last clearing of "show interface" counters 0:02:30
  Output queue 40/50, 60 drops; input queue 10/40, 2 drops
  Five minute input rate 0 bits/sec, 0 packets/sec
  Five minute output rate 0 bits/sec, 0 packets/sec
     3916 packets input, 960303 bytes, 3 no buffer
     Received 2 broadcasts, 3 runts, 3 giants
     2 input errors, 1 CRC, 1 frame, 1 overrun, 3 ignored, 2 abort
     2500 packets output, 128288 bytes, 1 underruns
     1 output errors, 1 collisions, 0 interface resets, 0 restarts
```

The following is sample output from the **showinterfaceslex** command when you specify the **serial** keyword:

```
Router# show interfaces lex 0 serial
Lex0-Serial0 is up, line protocol is up
  Hardware is LAN-Extender
  Last input 6w3d, output 6w3d
  Last clearing of "show interface" counters 0:03:05
  Input queue: 5/15/4 (size/max/drops); Total output drops: 450
  Output queue: high 25/35/90, medium 70/80/180, normal 40/50/120, low 10/20/60
  Five minute input rate 0 bits/sec, 0 packets/sec
  Five minute output rate 0 bits/sec, 0 packets/sec
     1939 packets input, 30998 bytes, 6 no buffer
     Received 4 broadcasts, 6 runts, 6 giants
     4 input errors, 2 CRC, 2 frame, 2 overrun, 6 ignored, 4 abort
     1939 packets output, 219535 bytes, 2 underruns
     2 output errors, 2 collisions, 0 interface resets, 0 restarts
     2 carrier transitions
```

The table below describes the fields shown in the preceding displays.

Table 28: show interfaces lex Field Descriptions

Field	Description
Lex0 is up, line protocol is up	Indicates whether the logical LAN Extender interface on the core router is currently active (that is, whether carrier detect is present), inactive, or has been taken down by an administrator.
Lex0-Ethernet0 is up, line protocol is up Lex0-Serial0 is up, line protocol is up	Indicates whether the physical Ethernet and serial interfaces on the LAN Extender chassis are currently active (that is, whether carrier detect is present) and whether it has been taken down by an administrator.
Hardware is LAN-Extender	Hardware type of the interfaces on the LAN Extender.

Field	Description
address is ...	Logical MAC address of the interface.
bia	Burned-in MAC address of the interface. The LAN Extender interface does not have a burned in address; hence it appears as all zeroes.
MTU	Maximum transmission unit size of the interface.
BW	Value of the bandwidth parameter that has been configured for the interface (in kilobits per second). The bandwidth parameter is used to compute IGRP metrics only. If the interface is attached to a serial line with a line speed that does not match the default (1536 or 1544 for T1 and 56 for a standard synchronous serial line), use the **bandwidth** command to specify the correct line speed for this serial line.
DLY	Delay of the interface in microseconds.
rely	Reliability of the interface as a fraction of 255 (255/255 is 100 percent reliability), calculated as an exponential average over 5 minutes.
load	Load on the interface as a fraction of 255 (255/255 is completely saturated), calculated as an exponential average over 5 minutes.
Encapsulation	Encapsulation method assigned to interface.
ARP type	Type of Address Resolution Protocol assigned.
ARP Timeout	Number of hours, minutes, and seconds an ARP cache entry will stay in the cache.
Bound to ...	Number of the serial interface to which the logical LAN Extender interface is bound.
Last input	Number of hours, minutes, and seconds since the last packet was successfully received by an interface and processed locally on the router. Useful for knowing when a dead interface failed. This counter is updated only when packets are process switched, not when packets are fast switched.
output	Number of hours, minutes, and seconds (or never) since the last packet was successfully transmitted by an interface. This counter is updated only when packets are process switched, not when packets are fast switched.
output hang	Number of hours, minutes, and seconds (or never) since the interface was last reset because of a transmission that took too long. When the number of hours in any of the “last” fields exceeds 24 hours, the number of days and hours is printed. If that field overflows, asterisks are printed.

Field	Description
Last clearing of "show interface" counters	Time at which the counters that measure cumulative statistics (such as number of bytes transmitted and received) shown in this report were last reset to zero. Note that variables that might affect routing (for example, load and reliability) are not cleared when the counters are cleared. *** indicates the elapsed time is too large to be displayed. 0:00:00 indicates the counters were cleared more than 231 ms (and less than 232 ms) ago.
Output queue, drops input queue, drops	Number of packets in output and input queues. Each number is followed by a slash, the maximum size of the queue, and the number of packets dropped because of a full queue.
Five minute input rate Five minute output rate	Average number of bits and packets transmitted per second in the last 5 minutes. The 5-minute input and output rates should be used only as an approximation of traffic per second during a given 5-minute period. These rates are exponentially weighted averages with a time constant of 5 minutes. A period of four time constants must pass before the average will be within two percent of the instantaneous rate of a uniform stream of traffic over that period.
packets input	Total number of error-free packets received by the system.
bytes	Total number of bytes, including data and MAC encapsulation, in the error-free packets received by the system.
no buffer	Number of received packets discarded because there was no buffer space in the main system. Compare with ignored count. Broadcast storms on Ethernet networks and bursts of noise on serial lines are often responsible for no input buffer events.
Received ... broadcasts	Total number of broadcast or multicast packets received by the interface.
runts	Number of packets that are discarded because they are smaller than the minimum packet size of the medium.
giants	Number of packets that are discarded because they exceed the maximum packet size of the medium.
input errors	Total number of no buffer, runts, giants, CRCs, frame, overrun, ignored, and abort counts. Other input-related errors can also increment the count, so that this sum might not balance with the other counts.
CRC	Cyclic redundancy checksum generated by the originating station or far-end device does not match the checksum calculated from the data received. On a serial link, CRCs usually indicate noise, gain hits, or other transmission problems on the data link.
frame	Number of packets received incorrectly having a CRC error and a noninteger number of octets. On a serial line, this is usually the result of noise or other transmission problems.

Field	Description
overrun	Number of times the serial receiver hardware was unable to hand received data to a hardware buffer because the input rate exceeded the receiver's ability to handle the data.
ignored	Number of received packets ignored by the interface because the interface hardware ran low on internal buffers. Broadcast storms and bursts of noise can cause the ignored count to be increased.
abort	Illegal sequence of one bits on a serial interface. This usually indicates a clocking problem between the serial interface and the data link equipment.
input packets with dribble condition detected	Does not apply to a LAN Extender interface.
packets output	Total number of messages transmitted by the system.
bytes	Total number of bytes, including data and MAC encapsulation, transmitted by the system.
underruns	Number of times that the transmitter has been running faster than the router can handle. This might never be reported on some interfaces.
output errors	Sum of all errors that prevented the final transmission of datagrams out of the interface being examined. Note that this might not balance with the sum of the enumerated output errors, as some datagrams may have more than one error, and others may have errors that do not fall into any of the specifically tabulated categories.
collisions	Number of messages retransmitted because of an Ethernet collision. Some collisions are normal. However, if your collision rate climbs to around 4 or 5 percent, you should consider verifying that there is no faulty equipment on the segment and/or moving some existing stations to a new segment. A packet that collides is counted only once in output packets.
interface resets	Number of times an interface has been completely reset. This can happen if packets queued for transmission were not sent within several seconds' time. On a serial line, this can be caused by a malfunctioning modem that is not supplying the transmit clock signal, or by a cable problem. If the system notices that the carrier detect line of a serial interface is up, but the line protocol is down, it periodically resets the interface in an effort to restart it. Interface resets can also occur when an interface is looped back or shut down.
restarts	Number of times the controller was restarted because of errors.

show interfaces loopback

To display information about the loopback interface, use the **showinterfacesloopback**command in privileged EXEC mode.

show interfaces loopback commandshow interfaces loopback [*number*] [**accounting**]

Syntax Description

number	(Optional) Port number on the selected interface.
accounting	(Optional) Displays the number of packets of each protocol type that have been sent through the interface.

Command Modes

Privileged EXEC

Command History

Release	Modification
10.0	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Examples

The following is sample output from the **showinterfacesloopback** command:

```
Router# show interfaces loopback 0
Loopback0 is up, line protocol is up
  Hardware is Loopback
  MTU 1500 bytes, BW 1 Kbit, DLY 50 usec, rely 255/255, load 1/255
  Encapsulation UNKNOWN, loopback not set, keepalive set (10 sec)
  Last input never, output never, output hang never
  Last clearing of "show interface" counters never
  Output queue 0/0, 0 drops; input queue 0/75, 0 drops
  Five minute input rate 0 bits/sec, 0 packets/sec
  Five minute output rate 0 bits/sec, 0 packets/sec
     0 packets input, 0 bytes, 0 no buffer
     Received 0 broadcasts, 0 runts, 0 giants
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     0 packets output, 0 bytes, 0 underruns
     0 output errors, 0 collisions, 0 interface resets, 0 restarts
```

The following is sample output when the **accounting** keyword is included:

```
Router# show interfaces loopback 0 accounting
Loopback0
                Protocol    Pkts In   Chars In   Pkts Out  Chars Out
No traffic sent or received on this interface.
```

The table below describes significant fields shown in the displays.

Table 29: ***show interfaces loopback*** *Field Descriptions*

Field	Description
Loopback is {up | down | administratively down}	Indicates whether the interface hardware is currently active (whether carrier detect is present), is currently inactive, or has been taken down by an administrator.
line protocol is {up | down | administratively down}	Indicates whether the software processes that handle the line protocol consider the line usable (that is, whether keepalives are successful).
Hardware	Hardware is Loopback.
MTU	Maximum transmission unit of the interface.
BW	Bandwidth of the interface, in kilobits per second.
DLY	Delay of the interface, in microseconds.
rely	Reliability of the interface as a fraction of 255 (255/255 is 100 percent reliability), calculated as an exponential average over 5 minutes.
load	Load on the interface as a fraction of 255 (255/255 is completely saturated), calculated as an exponential average over 5 minutes.
Encapsulation	Encapsulation method assigned to interface.
loopback	Indicates whether loopback is set and type of loopback test.
keepalive	Indicates whether keepalives are set or not.
Last input	Number of hours, minutes, and seconds since the last packet was successfully received by an interface and processed locally on the router. Useful for knowing when a dead interface failed. This counter is updated only when packets are process-switched, not when packets are fast-switched.
Last output	Number of hours, minutes, and seconds since the last packet was successfully transmitted by an interface. This counter is updated only when packets are process-switched, not when packets are fast-switched.
output hang	Number of hours, minutes, and seconds (or never) since the interface was last reset because of a transmission that took too long. When the number of hours in any of the “last” fields exceeds 24 hours, the number of days and hours is printed. If that field overflows, asterisks are printed.
Last clearing	Time at which the counters that measure cumulative statistics (such as number of bytes transmitted and received) shown in this report were last reset to zero. Note that variables that might affect routing (for example, load and reliability) are not cleared when the counters are cleared. *** indicates the elapsed time is too large to be displayed. 0:00:00 indicates the counters were cleared more than 231 ms (and less than 232 ms) ago.

Field	Description
Output queue, drops; Input queue, drops	Number of packets in output and input queues. Each number is followed by a slash, the maximum size of the queue, and the number of packets dropped because of a full queue.
Five minute input rate, Five minute output rate	Average number of bits and packets transmitted per second in the last 5 minutes.
packets input	Total number of error-free packets received by the system.
bytes input	Total number of bytes, including data and MAC encapsulation, in the error-free packets received by the system.
no buffer	Number of received packets discarded because there was no buffer space in the main system. Compare with ignored count. Broadcast storms on Ethernet networks and bursts of noise on serial lines are often responsible for no input buffer events.
broadcasts	Total number of broadcast or multicast packets received by the interface.
runts	Number of packets that are discarded because they are smaller than the minimum packet size of the medium.
giants	Number of packets that are discarded because they exceed the maximum packet size of the medium.
input errors	Sum of all errors that prevented the receipt of datagrams on the interface being examined. This may not balance with the sum of the enumerated output errors, because some datagrams may have more than one error and others may have errors that do not fall into any of the specifically tabulated categories.
CRC	Cyclic redundancy checksum generated by the originating LAN station or far-end device does not match the checksum calculated from the data received. On a LAN, this usually indicates noise or transmission problems on the LAN interface or the LAN bus itself. A high number of CRCs is usually the result of collisions or a station transmitting bad data. On a serial link, CRCs usually indicate noise, gain hits, or other transmission problems on the data link. CRC errors are also reported when a far-end abort occurs, and when the idle flag pattern is corrupted. This makes it possible to get CRC errors even when there is no data traffic.
frame	Number of packets received incorrectly having a CRC error and a noninteger number of octets. On a serial line, this is usually the result of noise or other transmission problems.
overrun	Number of times the serial receiver hardware was unable to hand received data to a hardware buffer because the input rate exceeded the receiver's ability to handle the data.
ignored	Number of received packets ignored by the interface because the interface hardware ran low on internal buffers. These buffers are different than the system buffers mentioned previously in the buffer description. Broadcast storms and bursts of noise can cause the ignored count to be increased.
abort	Number of packets whose receipt was aborted.

Field	Description
packets output	Total number of messages transmitted by the system.
bytes output	Total number of bytes, including data and MAC encapsulation, transmitted by the system.
underruns	Number of times that the far-end transmitter has been running faster than the near-end router's receiver can handle. This may never happen (be reported) on some interfaces.
output errors	Sum of all errors that prevented the final transmission of datagrams out of the interface being examined. Note that this may not balance with the sum of the enumerated output errors, as some datagrams may have more than one error, and others may have errors that do not fall into any of the specifically tabulated categories.
collisions	Loopback interface does not have collisions.
interface resets	Number of times an interface has been completely reset. This can happen if packets queued for transmission were not sent within several seconds time. On a serial line, this can be caused by a malfunctioning modem that is not supplying the transmit clock signal, or by a cable problem. If the system notices that the carrier detect line of a serial interface is up, but the line protocol is down, it periodically resets the interface in an effort to restart it. Interface resets can also occur when an interface is looped back or shut down.
restarts	Number of times the controller was restarted because of errors.
Protocol	Protocol that is operating on the interface.
Pkts In	Number of packets received for that protocol.
Chars In	Number of characters received for that protocol.
Pkts Out	Number of packets transmitted for that protocol.
Chars Out	Number of characters transmitted for that protocol.

show interfaces port-channel

To display the information about the Fast EtherChannel on Cisco 7000 series routers with the RSP7000 and RSP7000CI, Cisco 7200 series routers, and Cisco 7500 series routers, use the **showinterfacesport-channel** command in user EXEC or privileged EXEC mode.

show interfaces port-channel commandshow interfaces port-channel [*channel-number*]

Syntax Description

channel-number	(Optional) Port channel number. Range is from 1 to 4.

Command Modes

User EXEC Privileged EXEC

Command History

Release	Modification
11.1 CA	This command was introduced.
12.1(5)T	This command was integrated into Cisco IOS Release 12.1(5)T.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
15.2(02)SA	This command was implemented on the Cisco ME 2600X Series Ethernet Access Switches.

Examples

The following is sample output from the **showinterfacesport-channel** command:

Note By default the hardware type is set to Fast EtherChannel.The default MTU is set to 1500 bytes. The maximum MTU size that can be configured on the native Gigabit Ethernet ports on the Cisco 7200 series router is 9216. The range of configurable MTU value is from 1500 to 9216.

```
Router# show interfaces port-channel 1
Port-channel1 is up, line protocol is up
  Hardware is FEChannel, address is 0000.0ca8.6220 (bia 0000.0000.0000)
  MTU 1500 bytes, BW 400000 Kbit, DLY 100 usec, rely 255/255, load 1/255
  Encapsulation ARPA, loopback not set, keepalive not set, fdx
  ARP type: ARPA, ARP Timeout 04:00:00
    No. of active members in this channel: 4
        Member 0 : Fast Ethernet1/0/0
        Member 1 : Fast Ethernet1/1/0
        Member 2 : Fast Ethernet4/0/0
        Member 3 : Fast Ethernet4/1/0
  Last input 01:22:13, output never, output hang never
  Last clearing of "show interface" counters never
  Queueing strategy: fifo
  Output queue 0/40, 0 drops; input queue 0/75, 0 drops
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
     223 packets input, 11462 bytes, 0 no buffer
     Received 1 broadcasts, 0 runts, 0 giants
```

```
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     0 watchdog, 0 multicast
     0 input packets with dribble condition detected
     192 packets output, 13232 bytes, 0 underruns
     0 output errors, 0 collisions, 0 interface resets
     0 babbles, 0 late collision, 0 deferred
     0 lost carrier, 0 no carrier
     0 output buffer failures, 0 output buffers swapped out
```

The following sample output from the **showinterfacesport-channel** shows Gigabit EtherChannel as hardware type and the MTU value as 9216:

```
Router# show interface port-channel 1
Port-channel1 is up, line protocol is up
  Hardware is GEChannel
, address is 0001.c929.c41b (bia 0001.c929.c41b)
  MTU 9216 bytes
, BW 1000000 Kbit, DLY 10 usec,
     reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation ARPA, loopback not set
  Keepalive set (10 sec)
  Unknown duplex, Unknown Speed, media type is unknown media type
  output flow-control is unsupported, input flow-control is unsupported
  ARP type: ARPA, ARP Timeout 04:00:00
    No. of active members in this channel: 1
        Member 0 : GigabitEthernet0/1 , Full-duplex, 1000Mb/s
    No. of Non-active members in this channel: 0
  Last input 00:00:04, output never, output hang never
  Last clearing of "show interface" counters never
  Input queue: 0/75/0/0 (size/max/drops/flushes); Total output drops: 0
  Queueing strategy: fifo
  Output queue: 0/40 (size/max)
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
     95 packets input, 34383 bytes, 0 no buffer
     Received 0 broadcasts, 0 runts, 0 giants, 0 throttles
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored
     0 watchdog, 0 multicast, 0 pause input
     0 input packets with dribble condition detected
     1 packets output, 77 bytes, 0 underruns
     2 output errors, 0 collisions, 0 interface resets
     0 babbles, 0 late collision, 0 deferred
     0 lost carrier, 0 no carrier, 0 pause output
     0 output buffer failures, 0 output buffers swapped out
```

The table below describes significant fields shown in the display.

Table 30: show interfaces port-channel Field Descriptions

Field	Description
Port-channel1 is up, line protocol is up	Indicates if the interface hardware is currently active and can transmit and receive or if it has been taken down by an administrator.
Hardware is	Hardware type (Fast EtherChannel).
address is	Address being used by the interface.
MTU	Maximum transmission unit of the interface.
BW	Bandwidth of the interface, in kilobits per second.

Field	Description
DLY	Delay of the interface, in microseconds.
rely	Reliability of the interface as a fraction of 255 (255/255 is 100 percent reliability), calculated as an exponential average over 5 minutes.
load	Load on the interface as a fraction of 255 (255/255 is completely saturated), calculated as an exponential average over 5 minutes. The calculation uses the value from the **bandwidth** interface configuration command.
Encapsulation	Encapsulation method assigned to the interface.
loopback	Indicates if loopbacks are set.
keepalive	Indicates if keepalives are set.
fdx	Indicates the interface is operating in full-duplex mode.
ARA type	ARP type on the interface.
ARP timeout	Number of hours, minutes, and seconds an ARP cache entry will stay in the cache.
No. of active members in this channel: 4	Number of Fast Ethernet interfaces that are currently active (not down) and part of the Fast EtherChannel group.
Member 0: Fast Ethernet1/0/0	Specific Fast Ethernet interface that is part of the Fast EtherChannel group.
Last input	Number of hours, minutes, and seconds since the last packet was successfully received by an interface and processed locally on the router. Useful for knowing when a dead interface failed. This counter is updated only when packets are process-switched, not when packets are fast-switched.
output	Number of hours, minutes, and seconds since the last packet was successfully transmitted by an interface. This counter is updated only when packets are process-switched, not when packets are fast-switched.
output hang	Number of hours, minutes, and seconds (or never) since the interface was last reset because of a transmission that took too long. When the number of hours in any of the “last” fields exceeds 24 hours, the number of days and hours is printed. If that field overflows, asterisks are printed.
last clearing	Time at which the counters that measure cumulative statistics (such as number of bytes transmitted and received) shown in this report were last reset to zero. Variables that might affect routing (for example, load and reliability) are not cleared when the counters are cleared. *** indicates the elapsed time is too large to be displayed. 0:00:00 indicates the counters were cleared more than 231 ms (and less than 232 ms)) ago.

Field	Description
Queueing strategy	First-in, first-out queueing strategy (other queueing strategies you might see are priority-list, custom-list, and weighted fair).
Output queue, drops input queue, drops	Number of packets in output and input queues. Each number is followed by a slash, the maximum size of the queue, and the number of packets dropped because a queue was full.
5 minute input rate 5 minute output rate	Average number of bits and packets received or transmitted per second in the last 5 minutes.
packets input	Total number of error-free packets received by the system.
bytes (input)	Total number of bytes, including data and MAC encapsulation, in the error-free packets received by the system.
no buffer	Number of received packets discarded because there was no buffer space in the main system. Compare with ignored count. Broadcast storms on Ethernets and bursts of noise on serial lines are often responsible for no input buffer events.
broadcasts	Total number of broadcast or multicast packets received by the interface.
runts	Number of packets that are discarded because they are smaller than the minimum packet size of the medium.
giants	Number of packets that are discarded because they exceed the maximum packet size of the medium.
input errors	Total number of no buffer, runts, giants, CRCs, frame, overrun, ignored, and abort counts. Other input-related errors can also increment the count, so that this sum might not balance with the other counts.
CRC	Cyclic redundancy checksum generated by the originating LAN station or far-end device does not match the checksum calculated from the data received. On a LAN, this usually indicates noise or transmission problems on the LAN interface or the LAN bus itself. A high number of CRCs is usually the result of collisions or a station transmitting bad data. On a serial link, CRCs usually indicate noise, gain hits or other transmission problems on the data link.
frame	Number of packets received incorrectly having a CRC error and a noninteger number of octets. On a serial line, this is usually the result of noise or other transmission problems.
overrun	Number of times the serial receiver hardware was unable to hand received data to a hardware buffer because the input rate exceeded the receiver's ability to handle the data.
ignored	Number of received packets ignored by the interface because the interface hardware ran low on internal buffers. These buffers are different than the system buffers mentioned previously in the buffer description. Broadcast storms and bursts of noise can cause the ignored count to be incremented.
abort	Illegal sequence of ones bit on the interface.

Field	Description
watchdog	Number of times watchdog receive timer expired. It happens when receiving a packet with length greater than 2048.
multicast	Number of multicast packets received.
input packets with dribble condition detected	Dribble bit error indicates that a frame is slightly too long. This frame error counter is incremented just for informational purposes; the router accepts the frame.
packets output	Total number of messages transmitted by the system.
bytes (output)	Total number of bytes, including data and MAC encapsulation, transmitted by the system.
underruns	Number of times that the far-end transmitter has been running faster than the near-end router's receiver can handle.
output errors	Sum of all errors that prevented the final transmission of datagrams out of the interface being examined. Note that this might not balance with the sum of the enumerated output errors, as some datagrams can have more than one error, and others can have errors that do not fall into any of the specifically tabulated categories.
collisions	Number of messages retransmitted because of an Ethernet collision. A packet that collides is counted only once in output packets.
interface resets	Number of times an interface has been completely reset. This can happen if packets queued for transmission were not sent within a certain interval. If the system notices that the carrier detect line of an interface is up, but the line protocol is down, it periodically resets the interface in an effort to restart it. Interface resets can also occur when an unrecoverable interface processor error occurred, or when an interface is looped back or shut down.
babbles	The transmit jabber timer expired.
late collision	Number of late collisions. Late collision happens when a collision occurs after transmitting the preamble. The most common cause of late collisions is that your Ethernet cable segments are too long for the speed at which you are transmitting.
deferred	Deferred indicates that the chip had to defer while ready to transmit a frame because the carrier was asserted.
lost carrier	Number of times the carrier was lost during transmission.
no carrier	Number of times the carrier was not present during the transmission.
output buffer failures	Number of times that a packet was not output from the output hold queue because of a shortage of MEMD shared memory.
output buffers swapped out	Number of packets stored in main memory when the output queue is full; swapping buffers to main memory prevents packets from being dropped when output is congested. The number is high when traffic is bursty.

Related Commands

Command	Description
interface multilink	Specifies a Fast EtherChannel and enters interface configuration mode.

show interfaces port-channel etherchannel

To display the load-balancing bucket distribution currently in use for a Gigabit EtherChannel (GEC) interface, use the **showinterfacesport-channeletherchannel** command in user EXEC or privileged EXEC mode.

show interfaces port-channel *channel-number* **etherchannel**

Syntax Description

channel-number	Port-channel group number. Range: 1 to 64.

Command Modes

User EXEC (>) Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Release 2.1	This command was introduced.
Cisco IOS XE Release 2.5	This command was modified. Information about flow-based load balancing was added to the output.

Usage Guidelines

The **showinterfacesport-channeletherchannel** command shows the bucket-to-member link mappings for load balancing on the GEC interface.

Load balancing uses the concept of buckets to map traffic flows to the member links of a port channel. The different traffic flows are mapped to buckets and each bucket has one active member link associated with it. All traffic flows that are mapped to a bucket use the member link assigned to the bucket.

There are two methods of load balancing on a GEC interface:

- VLAN-manual--All packets forwarded over the same VLAN subinterface are considered part of the same flow and are mapped to the member link specified in the configuration.
- Flow-based--Traffic flows are mapped to different member links based on the packet header.

Examples

The following example shows output from this command for a port channel with VLAN-manual load balancing configured:

```
Router# show interfaces port-channel 2 etherchannel

 All IDBs List contains 3 configured interfaces
  Port: GigabitEthernet2/1/6 (index: 0)
  Port: GigabitEthernet2/1/7 (index: 1)
  Port: GigabitEthernet2/1/0 (index: 2)

 Active Member List contains 1 interfaces
  Port: GigabitEthernet2/1/0

 Passive Member List contains 2 interfaces
  Port: GigabitEthernet2/1/6
    VLAN 1 (Pri, Ac, D, P)    VLAN 50 (Sec, St, D, P)
  Port: GigabitEthernet2/1/7
    VLAN 1 (Sec, St, D, P)    VLAN 50 (Pri, Ac, C, P)
 Load-Balancing method applied: vlan-manual

 Bucket Information for VLAN Manual LB:
```

```
   Bucket 0   (p=GigabitEthernet2/1/6, s=GigabitEthernet2/1/6) active GigabitEthernet2/1/6

   Bucket 1   (p=GigabitEthernet2/1/6, s=GigabitEthernet2/1/7) active GigabitEthernet2/1/6

   Bucket 2   (p=GigabitEthernet2/1/6, s=GigabitEthernet2/1/0) active GigabitEthernet2/1/0

   Bucket 4   (p=GigabitEthernet2/1/7, s=GigabitEthernet2/1/6) active GigabitEthernet2/1/7

   Bucket 5   (p=GigabitEthernet2/1/7, s=GigabitEthernet2/1/7) active GigabitEthernet2/1/7

   Bucket 6   (p=GigabitEthernet2/1/7, s=GigabitEthernet2/1/0) active GigabitEthernet2/1/0

   Bucket 8   (p=GigabitEthernet2/1/0, s=GigabitEthernet2/1/6) active GigabitEthernet2/1/0

   Bucket 9   (p=GigabitEthernet2/1/0, s=GigabitEthernet2/1/7) active GigabitEthernet2/1/0

   Bucket 10   (p=GigabitEthernet2/1/0, s=GigabitEthernet2/1/0) active GigabitEthernet2/1/0
```

The following example shows output for a port channel with flow-based load balancing configured:

```
Router(config)# show interfaces port-channel 2 etherchannel

 All IDBs List contains 3 configured interfaces
  Port: GigabitEthernet2/1/6 (index: 0)
  Port: GigabitEthernet2/1/7 (index: 1)
  Port: GigabitEthernet2/1/0 (index: 2)

 Active Member List contains 1 interfaces
  Port: GigabitEthernet2/1/0

 Passive Member List contains 2 interfaces
  Port: GigabitEthernet2/1/6

  Port: GigabitEthernet2/1/7

 Load-Balancing method applied: flow-based

 Bucket Information for Flow-Based LB:
 Interface:                                Buckets
    GigabitEthernet2/1/0:
                           Bucket 0 , Bucket 1 , Bucket 2 , Bucket 3
                           Bucket 4 , Bucket 5 , Bucket 6 , Bucket 7
                           Bucket 8 , Bucket 9 , Bucket 10, Bucket 11
                           Bucket 12, Bucket 13, Bucket 14, Bucket 15
```

The table below describes the significant fields shown in the display.

Table 31: show interfaces port-channel etherchannel Field Descriptions

Field	Description
Active Member List	List of active physical interfaces in the GEC bundle.
Passive Member List	List of passive (backup) physical interfaces in the GEC bundle.
Load-Balancing method applied	The load-balancing method configured on the interface, either flow-based or vlan-manual.
Bucket Information	Lists the bucket information across the active member links.

Related Commands

Command	Description
load-balancing	Applies a load-balancing method to a GEC interface.
port-channel load-balancing vlan-manual	Applies the VLAN-manual load-balancing method globally to all GEC interfaces.
show etherchannel load-balancing	Displays the load-balancing method applied to GEC interfaces.

show interfaces pos

To display configuration information and statistics for a Packet over SONET (POS) interface, use the **showinterfacespos** command in user EXEC or privileged EXEC configuration mode.

Cisco 7000 and Cisco 7500 Series with VIPs
show interfaces pos commandshow interfaces pos [*slot*/*port-adapter*/*port*]

POS Shared Port Adapters
show interfaces pos [*slot*/*subslot*/*port* [/*sub_int*]]

Syntax Description

slot / *port-adapter* / *port*	**(Optional) Cisco 7000 or Cisco 7500 Series Routers** Number of the chassis slot that contains the POS interface (for example, 2/0/0), where: • *slot* --Chassis slot number. • / *port-adapter*-- Port adapter number. • / *port*-- Port or interface number. Refer to the appropriate hardware manual for slot and port information, and port adapter compatibility.
slot / *subslot* / *port* / *sub_int*	**(Optional) POS Shared Port Adapters** Number of the chassis slot that contains the POS interface (for example 4/3/0), where: • *slot* --Chassis slot number. Refer to the appropriate hardware manual for slot information. For SIPs, refer to the platform-specific SPA hardware installation guide or the corresponding "Identifying Slots and Subslots for SIPs and SPAs" topic in the platform-specific SPA software configuration guide. • / *subslot*-- Secondary slot number on a SPA interface processor (SIP) where a SPA is installed. Refer to the platform-specific SPA hardware installation guide and the corresponding "Specifying the Interface Address on a SPA" topic in the platform-specific SPA software configuration guide for subslot information. • / *port* --Port or interface number. For SPAs, refer to the corresponding "Specifying the Interface Address on a SPA" topics in the platform-specific SPA software configuration guide. • / *sub_int* -- (Optional) Subinterface number.

Command Modes

User EXEC Privileged EXEC

Command History

Release	Modification
11.2	The **showinterfaceposi** command was introduced.
11.3	The name of the command was modified from **showinterfaceposi**to **showinterfacespos**, and the sample output was updated.
12.2(25)S3	This command was integrated into Cisco IOS Release 12.2(25)S3 to support SPAs on the Cisco 7304 router. The command was modified to support a new addressing format for SPAs.
12.2(18)SXE	This command was integrated into Cisco IOS Release 12.2(18)SXE to support SPAs on the Cisco 7600 series routers and Catalyst 6500 series switches.
12.0(31)S	This command was integrated into Cisco IOS Release 12.0(31)S to support SPAs on the Cisco 12000 series routers.

Examples

Cisco 7513 Example

The following is sample output from the **showinterfacespos** command on a Cisco 7513 router with one Packet OC-3 Interface Processor (POSIP):

```
Router# show interfaces pos 2/0/0
POS2/0/0 is up, line protocol is up
  Hardware is cyBus Packet over Sonet
  Description: PRI-T1 net to zippy (4K) to Pac-Bell
  Internet address is 10.1.1.1/27
  MTU 4470 bytes, BW 1000 Kbit, DLY 40000 usec, rely 255/255, load 1/255
  Encapsulation HDLC, loopback not set, keepalive set (3 sec)
  Last input 00:00:00, output 00:00:00, output hang never
  Last clearing of "show interface" counters 00:23:09
  Queueing strategy: fifo
  Output queue 0/40, 0 drops; input queue 0/75, 0 drops
  5 minute input rate 0 bits/sec, 1 packets/sec
  5 minute output rate 1000 bits/sec, 1 packets/sec
     1046 packets input, 54437 bytes, 0 no buffer
     Received 485 broadcasts, 0 runts, 0 giants, 0 parity
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     4013 packets output, 1357412 bytes, 0 underruns
     0 output errors, 0 applique, 0 interface resets
     0 output buffer failures, 0 output buffers swapped out
     0 carrier transitions
```

Cisco 7600 Series Router and Catalyst 6500 Series Switch POS Shared Port Adapter Example

The following is sample output from the **showinterfacespos** command on a Cisco 7600 series router or Catalyst 6500 series switch for POS interface 4/3/0 (which is the interface for port 0 of the SPA in subslot 3 of the SIP in chassis slot 4):

```
Router# show interfaces pos 4/3/0

POS4/3/0 is up, line protocol is up  (APS working - active)
  Hardware is Packet over SONET
  Internet address is 10.0.0.1/8
  MTU 4470 bytes, BW 622000 Kbit, DLY 100 usec, rely 255/255, load 1/255
```

```
  Encapsulation HDLC, crc 16, loopback not set
  Keepalive not set
  Scramble disabled
  Last input 00:00:34, output 04:09:06, output hang never
  Last clearing of "show interface" counters never
  Queueing strategy:fifo
  Output queue 0/40, 0 drops; input queue 0/75, 0 drops
        Available Bandwidth 622000 kilobits/sec
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
     782 packets input, 226563 bytes, 0 no buffer
     Received 0 broadcasts, 1 runts, 0 giants, 0 throttles
              0 parity
     1 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     271 packets output, 28140 bytes, 0 underruns
     0 output errors, 0 applique, 2 interface resets
     0 output buffer failures, 0 output buffers swapped out
     2 carrier transitions
```

Cisco 12000 Series Router POS Shared Port Adapter Example

The following is sample output from the **showinterfacespos** command on a Cisco 12000 series router for POS interface 1/1/0 (which is the interface for port 0 of the SPA in subslot 1 of the SIP in chassis slot 1):

```
Router# show interfaces pos 1/1/0

POS1/1/0 is up, line protocol is up
  Hardware is Packet over SONET
  Internet address is 10.41.41.2/24
  MTU 4470 bytes, BW 9952000 Kbit, DLY 100 usec, rely 255/255, load 1/255
  Encapsulation HDLC, crc 32, loopback not set
  Keepalive not set
  Scramble enabled
  Last input 00:00:59, output 00:00:11, output hang never
  Last clearing of "show interface" counters 00:00:14
  Queueing strategy: fifo
  Output queue 0/40, 0 drops; input queue 0/75, 0 drops
        Available Bandwidth 9582482 kilobits/sec
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
     0 packets input, 0 bytes, 0 no buffer
     Received 0 broadcasts, 0 runts, 0 giants, 0 throttles
              0 parity
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     1 packets output, 314 bytes, 0 underruns
     0 output errors, 0 applique, 0 interface resets
     0 output buffer failures, 0 output buffers swapped out
     0 carrier transitions
```

The table below describes the significant fields shown in these displays.

*Table 32: **show interfaces pos** Field Descriptions*

Field	Description
POSx/y/z is up, line protocol is up	Indicates whether the interface hardware is currently active and can transmit and receive or whether it has been taken down by an administrator.

Field	Description
Hardware is. . .	Hardware type: • For POSIP-- cyBus Packet over Sonet • For POS SPAs--Packet over SONET
Internet address is	Internet address and subnet mask.
MTU	Maximum transmission unit of the interface.
BW	Bandwidth of the interface, in kilobits per second.
DLY	Delay of the interface, in microseconds.
rely	Reliability of the interface as a fraction of 255 (255/255 is 100 percent reliability), calculated as an exponential average over 5 minutes.
load	Load on the interface as a fraction of 255 (255/255 is completely saturated), calculated as an exponential average over 5 minutes. The calculation uses the value from the **bandwidth** interface configuration command.
Encapsulation	Encapsulation method assigned to interface.
Loopback	Indicates whether loopbacks are set.
Keepalive	Indicates whether keepalives are set.
Scramble	Indicates whether or not SONET payload scrambling is enabled. SONET scrambling is disabled by default. For the POS SPAs on the Cisco 12000 series routers, scrambling is enabled by default.
Last input	Number of hours, minutes, and seconds since the last packet was successfully received by an interface and processed locally on the router. Useful for knowing when a dead interface failed. This counter is updated only when packets are process-switched, not when packets are fast-switched.
(Last) output	Number of hours, minutes, and seconds since the last packet was successfully transmitted by an interface. This counter is updated only when packets are process-switched, not when packets are fast-switched.
(Last) output hang	Number of hours, minutes, and seconds (or never) since the interface was last reset because of a transmission that took too long. When the number of hours in any of the “last” fields exceeds 24 hours, the number of days and hours is printed. If that field overflows, asterisks are printed.

Field	Description
Last clearing	Time at which the counters that measure cumulative statistics (such as number of bytes transmitted and received) shown in this report were last reset to zero. Note that variables that might affect routing (for example, load and reliability) are not cleared when the counters are cleared. *** indicates the elapsed time is too large to be displayed. 0:00:00 indicates the counters were cleared more than 2231 ms (and less than 232 ms) ago.
Queueing strategy	First-in, first-out (FIFO) queueing strategy (other queueing strategies you might see are priority-list, custom-list, and weighted fair).
Output queue, drops input queue, drops	Number of packets in output and input queues. Each number is followed by a slash, the maximum size of the queue, and the number of packets dropped because a queue was full.
5 minute input rate 5 minute output rate	Average number of bits and packets received or transmitted per second in the last 5 minutes.
packets input	Total number of error-free packets received by the system.
bytes (input)	Total number of bytes, including data and MAC encapsulation, in the error-free packets received by the system.
no buffer	Number of received packets discarded because there was no buffer space in the main system. Compare with ignored count. Broadcast storms on Ethernets and bursts of noise on serial lines are often responsible for no input buffer events.
broadcasts	Total number of broadcast or multicast packets received by the interface.
runts	Number of packets that are discarded because they are smaller than the minimum packet size of the medium.
giants	Number of packets that are discarded because they exceed the maximum packet size of the medium.
throttles	Not supported for POS interfaces.
parity	Report of the parity errors on the interface.
input errors	Total number of no buffer, runts, giants, CRCs, frame, overrun, ignored, and abort counts. Other input-related errors can also increment the count, so that this sum might not balance with the other counts.
CRC	Cyclic redundancy checksum generated by the originating LAN station or far-end device does not match the checksum calculated from the data received. On a LAN, this usually indicates noise or transmission problems on the LAN interface or the LAN bus itself. A high number of CRCs is usually the result of collisions or a station transmitting bad data. On a serial link, CRCs usually indicate noise, gain hits or other transmission problems on the data link.

Field	Description
frame	Number of packets received incorrectly having a CRC error and a noninteger number of octets. On a serial line, this is usually the result of noise or other transmission problems.
overrun	Number of times the serial receiver hardware was unable to hand received data to a hardware buffer because the input rate exceeded the receiver's ability to handle the data.
ignored	Number of received packets ignored by the interface because the interface hardware ran low on internal buffers. These buffers are different than the system buffers mentioned previously in the buffer description. Broadcast storms and bursts of noise can cause the ignored count to be incremented.
abort	Illegal sequence of one bits on the interface.
packets output	Total number of messages transmitted by the system.
bytes (output)	Total number of bytes, including data and MAC encapsulation, transmitted by the system.
underruns	Number of times that the far-end transmitter has been running faster than the near-end router's receiver can handle.
output errors	Sum of all errors that prevented the final transmission of datagrams out of the interface being examined. Note that this might not balance with the sum of the enumerated output errors, as some datagrams can have more than one error, and others can have errors that do not fall into any of the specifically tabulated categories.
applique	Indicates an unrecoverable error has occurred on the POSIP applique. The system then invokes an interface reset.
interface resets	Number of times an interface has been completely reset. This can happen if packets queued for transmission were not sent within a certain interval. If the system notices that the carrier detect line of an interface is up, but the line protocol is down, it periodically resets the interface in an effort to restart it. Interface resets can also occur when an unrecoverable interface processor error occurred, or when an interface is looped back or shut down.
output buffer failures	Not supported for POS interfaces.
output buffers swapped out	Not supported for POS interfaces.
carrier transitions	Number of times the carrier detect signal of the interface has changed state.

Related Commands

Command	Description
interface	Configures an interface type and enters interface configuration mode.

show interfaces private-vlan mapping

To display the information about the private virtual local area network (PVLAN) mapping for VLAN SVIs, use the **showinterfacesprivate-vlanmapping** command in user EXEC or privileged EXEC mode.

show interfaces [*interface interface-number*] **private-vlan mapping** [**active**]

Syntax Description

interface	(Optional) Interface type; possible valid values are **ethernet**, **fastethernet**, **gigabitethernet**, **tengigabitethernet**, **pos**, **atm**, and **ge-wan**.
interface-number	(Optional) Module and port number; see the "Usage Guidelines" section for valid values.
active	(Optional) Displays the active interfaces only.

Command Default

This command has no default settings.

Command Modes

User EXEC Privileged EXEC

Command History

Release	Modification
12.2(14)SX	Support for this command was introduced on the Supervisor Engine 720.
12.2(17d)SXB	Support for this command on the Supervisor Engine 2 was extended to Release 12.2(17d)SXB.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

Usage Guidelines

The **pos**, **atm**, and **ge-wan** keywords are supported on Cisco 7600 series routers that are configured with a Supervisor Engine 2.

This command displays SVI information only.

The *interface-number*argument designates the module and port number. Valid values for *interface-number* depend on the chassis and module that are used. For example, if you have a 48-port 10/100BASE-T Ethernet module that is installed in a 13-slot chassis, valid values for the slot number are from 1 to 13 and valid values for the port number are from 1 to 48.

Examples

This example shows how to display the information about the PVLAN mapping:

```
Router# show interfaces private-vlan mapping
Interface Secondary VLAN Type
--------- -------------- -----------------
vlan2     301            community
vlan2     302            community
Router#
```

Related Commands

Command	Description
private-vlan	Configures PVLANs and the association between a PVLAN and a secondary VLAN.

Command	Description
private-vlan mapping	Creates a mapping between the primary and the secondary VLANs so that both VLANs share the same primary VLAN SVI.

show interfaces satellite

To display general interface settings and traffic rates for the internal router interface that connects to an installed Cisco IP VSAT satellite WAN network module (NM-1VSAT-GILAT), use the **showinterfacessatellite** command in user EXEC or privileged EXEC mode.

Syntax:

show interfaces satellite *slot* / *unit*

Syntax Description

slot	Router chassis slot in which the network module is installed.
unit	Interface number. For NM-1VSAT-GILAT network modules, always use 0.

Command Default

No default behavior or values.

Command Modes

User EXEC Privileged EXEC

Command History

Release	Modification
12.3(14)T	This command was introduced.

Usage Guidelines

The **showinterfacessatellite** command shows these items:

- Basic configuration information for the internal router interface that connects to an installed Cisco IP VSAT satellite WAN network module (NM-1VSAT-GILAT)
- Traffic statistics, including the number of packets transmitted, input and output rate, and errors
- Interface and line protocol status (up or down), with the following exceptions:
  - *Line Protocol Status Exception - Hub Dial Backup Mode*
  - *Line Protocol Status Exception - Hot Standby Router Protocol (HSRP) Standby Mode*

Line Protocol Status Exception--Hub Dial Backup Mode

If you configure hub dial backup mode on the satellite interface, then the **showinterfacessatellite** command always displays Line Protocol Up status, even when the line protocol is down. To view the actual line protocol status, enter the **showcontrollerssatellite** command or the **service-modulesatellite***slot*/**0status** command in privileged EXEC mode.

Line Protocol Status Exception--Hot Standby Router Protocol (HSRP) Standby Mode

If the router is in a hot standby group and is in standby mode, then the **showinterfacessatellite** command displays “line protocol is up (standby)”, even though a link to the hub is not established from the standby router. To view the actual line protocol status, enter the **showcontrollerssatellite** command or the **service-modulesatellite***slot*/**0status** command in privileged EXEC mode.

Examples

For output field descriptions, see the table below.

This section provides the following examples:

Normal Operation or Hub Dial Backup Mode Example

In the following example, the satellite interface is up and the line protocol is up.

If you configure hub dial backup for the NM-1VSAT-GILAT network module, the line protocol appears to be up even if the satellite link is actually down. To view the actual line protocol status while hub dial backup mode is configured, use the **showcontrollerssatellite** command or the **service-modulesatellite***slot*/**0status** command instead.

```
Router# show interfaces satellite 2/0

Satellite2/0 is up
, line protocol is up
  Hardware is I82559FE, address is 0008.e35f.7370 (bia 0008.e35f.7370)
  Internet address is 10.22.1.2/24
  MTU 1500 bytes, BW 100000 Kbit, DLY 100 usec,
     reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation ARPA, loopback not set
  Keepalive not set
  ARP type:ARPA, ARP Timeout 04:00:00
  Last input 00:00:02, output 00:00:00, output hang never
  Last clearing of "show interface" counters never
  Input queue:0/75/0/0 (size/max/drops/flushes); Total output drops:0
  Queueing strategy:fifo
  Output queue:0/40 (size/max)
  5 minute input rate 13000 bits/sec, 6 packets/sec
  5 minute output rate 8000 bits/sec, 9 packets/sec
     419433 packets input, 108329352 bytes, 0 no buffer
     Received 11792 broadcasts, 0 runts, 0 giants, 0 throttles
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored
     0 input packets with dribble condition detected
     650568 packets output, 73969720 bytes, 0 underruns
     0 output errors, 0 collisions, 0 interface resets
     0 babbles, 0 late collision, 0 deferred
     0 lost carrier, 0 no carrier
     0 output buffer failures, 0 output buffers swapped out
```

Satellite Backup for a Terrestrial Link--Standby Mode Example

In the following example, the satellite interface is in standby mode because the primary terrestrial link is up:

```
Router# show interfaces satellite 1/0

Satellite1/0 is standby mode
, line protocol is down

  Hardware is I82559FE, address is 00e0.f7ff.f310 (bia 00e0.f7ff.f310)
  Internet address is 10.0.0.1/24
  MTU 1500 bytes, BW 100000 Kbit, DLY 100 usec,
     reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation ARPA, loopback not set
  Keepalive not set
  ARP type:ARPA, ARP Timeout 04:00:00
  Last input 00:00:00, output 00:00:03, output hang never
  Last clearing of "show interface" counters 00:00:04
  Input queue:0/75/0/0 (size/max/drops/flushes); Total output drops:0
  Queueing strategy:fifo
```

```
Output queue:0/40 (size/max)
30 second input rate 13000 bits/sec, 6 packets/sec
30 second output rate 0 bits/sec, 0 packets/sec
   30 packets input, 7474 bytes, 0 no buffer
   Received 1 broadcasts, 0 runts, 0 giants, 0 throttles
   0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored
   0 input packets with dribble condition detected
   1 packets output, 82 bytes, 0 underruns
   0 output errors, 0 collisions, 0 interface resets
   0 babbles, 0 late collision, 0 deferred
   0 lost carrier, 0 no carrier
   0 output buffer failures, 0 output buffers swapped out
```

Hot Standby Router Protocol (HSRP)--Standby Mode Example

In the following example, homogeneous HSRP is configured on two routers, each of which contains an NM-1VSAT-GILAT network module that connects to the same dish antenna (ODU). The following output from the standby router shows that the line protocol is "up (standby)," even though the satellite link on the standby router is actually down. To view the actual line protocol status, use the **showcontrollerssatellite** command or the **service-modulesatellite***slot*/**0status** command.

```
Router# show interfaces satellite 2/0

Satellite2/0 is up
, line protocol is up (standby)
  Hardware is I82559FE, address is 0008.e35f.7370 (bia 0008.e35f.7370)
  Internet address is 10.22.1.2/24
  MTU 1500 bytes, BW 100000 Kbit, DLY 100 usec,
     reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation ARPA, loopback not set
  Keepalive not set
  ARP type:ARPA, ARP Timeout 04:00:00
  Last input 00:00:02, output 00:00:00, output hang never
  Last clearing of "show interface" counters never
  Input queue:0/75/0/0 (size/max/drops/flushes); Total output drops:0
  Queueing strategy:fifo
  Output queue:0/40 (size/max)
  5 minute input rate 13000 bits/sec, 6 packets/sec
  5 minute output rate 8000 bits/sec, 9 packets/sec
     419433 packets input, 108329352 bytes, 0 no buffer
     Received 11792 broadcasts, 0 runts, 0 giants, 0 throttles
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored
     0 input packets with dribble condition detected
     650568 packets output, 73969720 bytes, 0 underruns
     0 output errors, 0 collisions, 0 interface resets
     0 babbles, 0 late collision, 0 deferred
     0 lost carrier, 0 no carrier
     0 output buffer failures, 0 output buffers swapped out
```

The table below describes the significant fields shown in the display.

Table 33: show interfaces satellite Field Descriptions

Field	Description
Satellite2/0 is... • up • down • standby mode	State of the interface hardware: • Currently active. • Has been taken down by an administrator. • In HSRP standby mode when two HSRP-redundant NM-1VSAT-GILAT network modules (in separate routers) connect to one dish antenna (ODU).
line protocol is	State of the backbone link to the hub: up or down. See the following exceptions:
Hardware is	Hardware type (for example, Fast Ethernet) and address.
Internet address	Internet address followed by subnet mask.
MTU	Maximum transmission unit of the interface.
BW	Bandwidth of the interface, in kilobits per second.
DLY	Delay of the interface, in microseconds.
reliability	Reliability of the interface as a fraction of 255 (255/255 is 100 percent reliability), calculated as an exponential average over 5 minutes.
txload and rxload	Transmitted and received load on the interface as a fraction of 255 (255/255 is completely saturated), calculated as an exponential average over 5 minutes.
Encapsulation	Encapsulation method assigned to the interface.
loopback	Indicates whether loopback is set or not.
keepalive	Indicates whether keepalives are set or not.
ARP type	Type of Address Resolution Protocol assigned.
Last input	Number of hours, minutes, and seconds since the last packet was successfully received by an interface and processed locally on the router. Useful for knowing when a dead interface failed. This counter is updated only when packets are process-switched, not when packets are fast-switched.
output	Number of hours, minutes, and seconds since the last packet was successfully transmitted by the interface. Useful for knowing when a dead interface failed. This counter is updated only when packets are process-switched, not when packets are fast-switched.
output hang	Number of hours, minutes, and seconds (or never) since the interface was last reset because of a transmission that took too long. When the number of hours in any of the “last” fields exceeds 24 hours, the number of days and hours is printed. If that field overflows, asterisks are printed.

Field	Description
Last clearing	Time at which the counters that measure cumulative statistics (such as number of bytes transmitted and received) shown in this report were last reset to zero. Note that variables that might affect routing (for example, load and reliability) are not cleared when the counters are cleared. *** indicates the elapsed time is too large to be displayed. 0:00:00 indicates the counters were cleared more than 2 31 ms (and less than 2 32 ms) ago.
Input queue	Input queue information: • Size--Number of packets in the input queue • Max--Maximum size of the queue • Drops--Number of packets discarded because of a full queue • Flushes--Number of times data on queue has been discarded
Total output drops	Total number of output packets dropped.
Queueing strategy	First-in, first-out queueing strategy (other queueing strategies you might see are priority-list, custom-list, and weighted fair).
Output queue	Number of packets in the output queue and the maximum size of the queue,
5 minute input rate 5 minute output rate	Average number of bits and packets transmitted per second in the last 5 minutes. The 5-minute input and output rates should be used only as an approximation of traffic per second during a given 5-minute period. These rates are exponentially weighted averages with a time constant of 5 minutes. A period of four time constants must pass before the average will be within two percent of the instantaneous rate of a uniform stream of traffic over that period.
packets input	Total number of error-free packets received by the system.
bytes	Total number of bytes, including data and MAC encapsulation, in the error-free packets received by the system.
no buffer	Number of received packets discarded because there was no buffer space in the main system. Compare with ignored count. Broadcast storms on Ethernet networks and bursts of noise on serial lines are often responsible for no input buffer events.
broadcasts	Total number of broadcast or multicast packets received by the interface.
runts	Number of packets that are discarded because they are smaller than the minimum packet size of the media.
giants	Number of packets that are discarded because they exceed the maximum packet size of the media.

Field	Description
throttles	Number of times that the interface requested another interface within the router to slow down.
input errors	Includes runts, giants, no buffer, CRC, frame, overrun, and ignored counts. Other input-related errors can also cause the input errors count to be increased, and some datagrams may have more than one error; therefore, this sum may not balance with the sum of enumerated input error counts.
CRC	Cyclic redundancy checksum generated by the originating LAN station or far-end device does not match the checksum calculated from the data received. On a LAN, this usually indicates noise or transmission problems on the LAN interface or the LAN bus itself. A high number of CRCs is usually the result of collisions or a station transmitting bad data.
frame	Number of packets received incorrectly having a CRC error and a noninteger number of octets. On a LAN, this is usually the result of collisions or a malfunctioning Ethernet device.
overrun	Number of times the receiver hardware was unable to hand received data to a hardware buffer because the input rate exceeded the receiver's ability to handle the data.
ignored	Number of received packets ignored by the interface because the interface hardware ran low on internal buffers. These buffers are different from the system buffers mentioned previously in the buffer description. Broadcast storms and bursts of noise can increase the ignored count.
input packets with dribble condition detected	Dribble bit error indicates that a frame is slightly too long. This frame error counter is incremented just for informational purposes; the router accepts the frame.
packets output	Total number of messages transmitted by the system.
bytes	Total number of bytes, including data and MAC encapsulation, transmitted by the system.
underruns	Number of times that the transmitter has been running faster than the router can handle. This may never be reported on some interfaces.
output errors	Sum of all errors that prevented the final transmission of datagrams out of the interface being examined. Note that this may not balance with the sum of the enumerated output errors, because some datagrams may have more than one error, and others may have errors that do not fall into any of the specifically tabulated categories.
collisions	Number of messages retransmitted because of an Ethernet collision. A packet that collides is counted only once in output packets.

Field	Description
interface resets	Number of times an interface has been completely reset. This can happen if packets queued for transmission were not sent within several seconds. On a serial line, this can be caused by a malfunctioning modem that is not supplying the transmit clock signal, or by a cable problem. If the system notices that the carrier detect line of a serial interface is up, but the line protocol is down, it periodically resets the interface in an effort to restart it. Interface resets can also occur when an interface is looped back or shut down.
babbles **Note** This field applies to the router internal interface that connects to the installed Cisco IP VSAT satellite WAN network module (NM-1VSAT-GILAT). This field typically does not apply to the external satellite interface.	Indicates that the transmit jabber timer expired.
late collision	Number of late collisions. Late collision happens when a collision occurs after the preamble has been transmitted. The most common cause of late collisions is that your Ethernet cable segments are too long for the speed at which you are transmitting.
deferred	Deferred indicates that the chip had to defer transmission while ready to transmit a frame, because the carrier was asserted.
lost carrier	Number of times the carrier was lost during transmission.
no carrier	Number of times the carrier was not present during the transmission.
output buffer failures	Number of failed buffers.
output buffers swapped out	Number of buffers swapped out.

Related Commands

Command	Description
service-module satellite status	Displays status information related to the hardware and software on the Cisco IP VSAT satellite WAN network module (NM-1VSAT-GILAT), including the initial configuration parameters.
show controllers satellite	Displays controller information about the internal router interface that connects to an installed Cisco IP VSAT satellite WAN network module (NM-1VSAT-GILAT).

show interfaces serial

To display information about a serial interface, use the**showinterfacesserial** command in privileged EXEC mode. When using Frame Relay encapsulation, use the **showinterfacesserial** command in user EXEC or privileged EXEC mode to display information about the multicast data-link connection identifier (DLCI), the DLCIs used on the interface, and the DLCI used for the Local Management Interface (LMI).

Cisco 4000 Series
show interfaces serial accounting commandshow interfaces serial [*number* [**:** *channel-group*]] [**accounting**]

Cisco 7200 Series
show interfaces serial [*slot*/*port*] [**accounting**]

Cisco 7000 and Cisco 7500 Series with the RSP7000, RSP7000CI, or Ports on VIPs
show interfaces serial [*slot*/*port-adapter*/*port*]

Cisco 7500 Series
show interfaces serial [*slot*/*port* [**:** *channel-group*]] [**accounting**]

Cisco 7500 Series with a CT3IP
show interfaces serial [*slot*/*port-adapter*/*port*] [**:** *t1-channel*] [**accounting** | **crb**]

Cisco AS5350 and Cisco AS5400 Universal Gateways
show interfaces serial *slot*/*port*

Cisco AS5800 Access Servers
show interfaces serial *dial-shelf*/*slot*/*t3-port* **:** *t1-num* **:** *chan-group*

Syntax Description

number	(Optional) Number of the port being displayed.
: *channel-group*	(Optional) On the Cisco 4000 series with a Network Management Processor (NPM) or the Cisco 7500 series routers with a MultiChannel Interface Processor (MIP), specifies the T1 channel-group number in the range of 0 to 23 defined with the **channel-group** controller configuration command.
accounting	(Optional) Displays the number of packets of each protocol type that have been sent through the interface.
slot	(Optional) Number of the slot being displayed. Refer to the appropriate hardware manual for slot and port information.
/ *port*	(Optional) Number of the port being displayed. Refer to the appropriate hardware manual for slot and port information.
/ *port-adapter*	(Optional) Number of the port adapter being displayed. Refer to the appropriate hardware manual for information about port adapter compatibility.

: *t1-channel*	(Optional) T1 channel number. For the CT3IP, the T1 channel is a number between 1 and 28. T1 channels on the CT3IP are numbered 1 to 28 rather than the more traditional zero-based scheme (0 to 27) used with other Cisco products. This scheme ensures consistency with telco numbering schemes for T1 channels within channelized T3 equipment.
crb	(Optional) Displays interface routing and bridging information.
dial-shelf	Dial shelf chassis in the Cisco AS5800 access server that contains the CT3 interface card.
slot	Location of the CT3 interface card in the dial shelf chassis.
t3-port	T3 port number. The only valid value is 0.
: *t1-num*	T1 time slot in the T3 line. The value can be from 1 to 28.
: *chan-group*	Channel group identifier.

Command Modes

User EXEC (when Frame Relay encapsulation is used) Privileged EXEC

Command History

Release	Modification
10.0	This command was introduced on the Cisco 4000 series routers.
11.0	This command was implemented on the Cisco 7000 series routers.
11.1CA	This command was modified to include sample output for the PA-2JT2, PA-E3, and PA-T3 serial port adapters.
11.3	This command was modified to include the CT3IP.
12.0(3)T	This command was implemented on the Cisco AS5800 access servers.
12.0(4)T	This command was modified to include enhanced display information for dialer bound interfaces.
12.2(11)T	This command was implemented on the Cisco AS5350 and Cisco AS5400.
12.2(13)T	This command was modified to display information about Frame Relay interface queueing and fragmentation.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines

Frame Relay

Use this command to determine the status of the Frame Relay link. This display also indicates Layer 2 status if switched virtual circuits (SVCs) are configured.

Channel Groups as Virtual Serial Interfaces

To find out about channel groups configured as virtual serial interfaces, to verify that the router has High-Level Data Link Control (HDLC) encapsulation on the interface, and to verify that the interface sees the loopback, use the **showinterfacesserial** command in privileged EXEC mode.

Examples

Example of Synchronous Serial Interface

The following is sample output from the **showinterfacesserial** command for a synchronous serial interface:

```
Router# show interfaces serial
Serial 0 is up, line protocol is up
   Hardware is MCI Serial
   Internet address is 192.168.10.203, subnet mask is 255.255.255.0
   MTU 1500 bytes, BW 1544 Kbit, DLY 20000 usec, rely 255/255, load 1/255
   Encapsulation HDLC, loopback not set, keepalive set (10 sec)
   Last input 0:00:07, output 0:00:00, output hang never
   Output queue 0/40, 0 drops; input queue 0/75, 0 drops
   Five minute input rate 0 bits/sec, 0 packets/sec
   Five minute output rate 0 bits/sec, 0 packets/sec
       16263 packets input, 1347238 bytes, 0 no buffer
       Received 13983 broadcasts, 0 runts, 0 giants
       2 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 2 abort
1 carrier transitions
     22146 packets output, 2383680 bytes, 0 underruns
     0 output errors, 0 collisions, 2 interface resets, 0 restarts
```

The table below describes significant fields shown in the display.

Table 34: show interfaces serial Field Descriptions--Synchronous Serial Interface

Field	Description
Serial ... is {up | down} ... is administratively down	Indicates whether the interface hardware is currently active (whether carrier detect is present), is currently inactive, or has been taken down by an administrator.
line protocol is {up | down}	Indicates whether the software processes that handle the line protocol consider the line usable (that is, whether keepalives are successful) or whether the line has been taken down by an administrator.
Hardware is	Specifies the hardware type.
Internet address is	Specifies the Internet address and subnet mask.
MTU	Maximum transmission unit of the interface.
BW	Indicates the value of the bandwidth parameter that has been configured for the interface (in kbps). If the interface is attached to a serial line with a line speed that does not match the default (1536 or 1544 kbps for T1 and 56 kbps for a standard synchronous serial line), use the **bandwidth**command to specify the correct line speed for this serial line.
DLY	Delay of the interface, in microseconds.

Field	Description
rely	Reliability of the interface as a fraction of 255 (255/255 is 100 percent reliability), calculated as an exponential average over 5 minutes.
load	Load on the interface as a fraction of 255 (255/255 is completely saturated), calculated as an exponential average over 5 minutes.
Encapsulation	Encapsulation method assigned to interface.
loopback	Indicates whether or not loopback is set.
keepalive	Indicates whether or not keepalives are set.
Last input	Number of hours, minutes, and seconds since the last packet was successfully received by an interface and processed locally on the router. Useful for knowing when a dead interface failed. This counter is updated only when packets are process-switched, not when packets are fast-switched.
Last output	Number of hours, minutes, and seconds since the last packet was successfully transmitted by an interface. This counter is updated only when packets are process-switched, not when packets are fast-switched.
output hang	Number of hours, minutes, and seconds (or never) since the interface was last reset because of a transmission that took too long. When the number of hours in any of the “last” fields exceeds 24 hours, the number of days and hours is printed. If that field overflows, asterisks are printed.
Output queue, drops input queue, drops	Number of packets in output and input queues. Each number is followed by a slash, the maximum size of the queue, and the number of packets dropped because of a full queue.
5 minute input rate 5 minute output rate	Average number of bits and packets transmitted per second in the last 5 minutes. The 5-minute input and output rates should be used only as an approximation of traffic per second during a given 5-minute period. These rates are exponentially weighted averages with a time constant of 5 minutes. A period of four time constants must pass before the average will be within two percent of the instantaneous rate of a uniform stream of traffic over that period.
packets input	Total number of error-free packets received by the system.
bytes	Total number of bytes, including data and MAC encapsulation, in the error-free packets received by the system.
no buffer	Number of received packets discarded because there was no buffer space in the main system. Compare with ignored count. Broadcast storms on Ethernet networks and bursts of noise on serial lines are often responsible for no input buffer events.
Received... broadcasts	Total number of broadcast or multicast packets received by the interface.
runts	Number of packets that are discarded because they are smaller than the minimum packet size of the medium.

Field	Description
giants	Number of packets that are discarded because they exceed the maximum packet size of the medium.
input errors	Total number of no buffer, runts, giants, CRCs, frame, overrun, ignored, and abort counts. Other input-related errors can also increment the count, so that this sum might not balance with the other counts.
CRC	Cyclic redundancy checksum generated by the originating station or far-end device does not match the checksum calculated from the data received. On a serial link, CRCs usually indicate noise, gain hits, or other transmission problems on the data link.
frame	Number of packets received incorrectly having a CRC error and a noninteger number of octets. On a serial line, this is usually the result of noise or other transmission problems.
overrun	Number of times the serial receiver hardware was unable to hand received data to a hardware buffer because the input rate exceeded the receiver's ability to handle the data.
ignored	Number of received packets ignored by the interface because the interface hardware ran low on internal buffers. Broadcast storms and bursts of noise can cause the ignored count to be increased.
abort	Illegal sequence of one bits on a serial interface. This usually indicates a clocking problem between the serial interface and the data link equipment.
carrier transitions	Number of times the carrier detect signal of a serial interface has changed state. For example, if data carrier detect (DCD) goes down and comes up, the carrier transition counter will increment two times. Indicates modem or line problems if the carrier detect line is changing state often.
packets output	Total number of messages transmitted by the system.
bytes output	Total number of bytes, including data and MAC encapsulation, transmitted by the system.
underruns	Number of times that the transmitter has been running faster than the router can handle. This might never be reported on some interfaces.
output errors	Sum of all errors that prevented the final transmission of datagrams out of the interface from being examined. Note that this might not balance with the sum of the enumerated output errors because some datagrams can have more than one error, and others can have errors that do not fall into any of the specifically tabulated categories.
collisions	Number of messages retransmitted because of an Ethernet collision. Some collisions are normal. However, if your collision rate climbs to around 4 or 5 percent, you should consider verifying that there is no faulty equipment on the segment and/or moving some existing stations to a new segment. A packet that collides is counted only once in output packets.

Field	Description
interface resets	Number of times an interface has been completely reset. This can happen if packets queued for transmission were not sent within several seconds' time. On a serial line, this can be caused by a malfunctioning modem that is not supplying the transmit clock signal or by a cable problem. If the system notices that the carrier detect line of a serial interface is up, but the line protocol is down, it periodically resets the interface in an effort to restart it. Interface resets can also occur when an interface is looped back or shut down.
restarts	Number of times the controller was restarted because of errors.
alarm indications, remote alarms, rx LOF, rx LOS	Number of CSU/DSU alarms and number of occurrences of receive loss of frame and receive loss of signal.
BER inactive, NELR inactive, FELR inactive	Status of G.703-E1 counters for bit-error rate (BER) alarm, near-end loop remote (NELR), and far-end loop remote (FELR). Note that you cannot set the NELR or FELR.

Example of PA-2JT2 Serial Interface

The following is sample output from the **showinterfacesserial** command for a PA-2JT2 serial interface:

```
Router# show interfaces serial 3/0/0
Serial3/0/0 is up, line protocol is up
  Hardware is cyBus Serial
  Internet address is 10.0.0.1/8
  MTU 1500 bytes, BW 6312 Kbit, DLY 20000 usec, rely 255/255, load 26/255
  Encapsulation HDLC, loopback not set, keepalive not set
  Last input 00:04:31, output 00:04:31, output hang never
  Last clearing of "show interface" counters 00:06:07
  Queueing strategy: fifo
  Output queue 0/40, 0 drops; input queue 0/75, 0 drops
  5 minute input rate 162000 bits/sec, 8 packets/sec
  5 minute output rate 162000 bits/sec, 8 packets/sec
     20005 packets input, 20080520 bytes, 0 no buffer
     Received 0 broadcasts, 0 runts, 0 giants
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     20005 packets output, 20080520 bytes, 0 underruns
     0 output errors, 0 collisions, 0 interface resets
     0 output buffer failures, 0 output buffers swapped out
     0 carrier transitions
     0 cv errors, 0 crc5 errors, 0 frame errors
     rxLOS inactive, rxLOF inactive, rxPAIS inactive
     rxAIS inactive, rxRAI inactive, rxHBER inactive
```

The table below describes significant fields shown in the display that are different from the fields described in the table above.

Table 35: show interfaces serial Field Descriptions--PA-2JT2

Field	Description
Last clearing of "show interface" counters	Time the counters were last cleared.
Queueing strategy	First-in, first-out queueing strategy (other queueing strategies that you might see are priority-list, custom-list, and weighted fair).
output buffer failures	Number of "no resource" errors received on the output.
output buffers swapped out	Number of packets swapped to DRAM.
carrier transitions	Number of times the carrier detect signal of a serial interface has changed state. For example, if data carrier detect (DCD) goes down and comes up, the carrier transition counter will increment two times. Indicates modem or line problems if the carrier detect line is changing state often.
cv errors	B8ZS/B6ZS (zero suppression) coding violation counter.
crc5 errors	CRC-5 error counter.
frame errors	Framing error counter.
rxLOS	Receive loss of signal alarm. Values are active or inactive.
rxLOF	Receive loss of frame alarm. Values are active or inactive.
rxPAIS	Receive loss of payload alarm indication signal (AIS). Values are active or inactive.
rxAIS	Receive loss of physical AIS. Values are active or inactive.
rxRAI	Receive remote AIS. Values are active or inactive.
rxHBER	Receive high bit-error rate alarm. Values are active or inactive.

Example of PA-E3 Serial Port Adapter

The following is sample output from the **showinterfacesserial** command for a PA-E3 serial port adapter installed in chassis slot 2:

```
Router# show interfaces serial 2/0
Serial2/0 is up, line protocol is up
  Hardware is M1T-E3 pa
  Internet address is 172.17.1.1/24
  MTU 4470 bytes, BW 34010 Kbit, DLY 200 usec, rely 128/255, load 1/255
  Encapsulation HDLC, loopback not set, keepalive not set
  Last input 1w0d, output 00:00:48, output hang never
  Last clearing of "show interface" counters 1w0d
  Queueing strategy: fifo
  Output queue 0/40, 0 drops; input queue 0/75, 0 drops
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
```

```
     20 packets input, 2080 bytes, 0 no buffer
     Received 0 broadcasts, 0 runts, 0 giants, 0 parity
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     11472 packets output, 3824748 bytes, 0 underruns
     0 output errors, 0 applique, 0 interface resets
     0 output buffer failures, 0 output buffers swapped out
     0 carrier transitions
   rxLOS inactive, rxLOF inactive, rxAIS inactive
   txAIS inactive, rxRAI inactive, txRAI inactive
```

Table 3 describes significant fields shown in the display that are different from the fields described in Table 1.

Table 36: show interfaces serial Field Descriptions--PA-E3

Field	Description
Last clearing of "show interface" counters	Time the counters were last cleared.
Queueing strategy	First-in, first-out queueing strategy (other queueing strategies that you might see are priority-list, custom-list, and weighted fair).
parity	Number of the parity errors on the interface.
applique	Indicates that an unrecoverable error has occurred on the E3 applique. The router then invokes an interface reset.
output buffer failures	Number of "no resource" errors received on the output.
output buffers swapped out	Number of packets swapped to DRAM.
rxLOS, rxLOF, rxAIS	Receive loss of signal, loss of frame, and alarm indication signal status. Values are inactive or active.
txAIS, rxRAI, txRAI	Transmit alarm indication signal, receive remote alarm indicator, and transmit remote alarm indicator status. Values are inactive or active. When the router receives an LOS, LOF, or AIS, the txRAI is active. When the remote router receives an LOS, LOF, or AIS, the rxRAI is active.

Example of 1-Port PA-T3 Serial Port Adapter Installed in a VIP2

The following is sample output from the **showinterfacesserial** command for a 1-port PA-T3 serial port adapter installed in a VIP2 in chassis slot 1, in port adapter slot 0:

```
Router# show interfaces serial 1/0/0
Serial1/0/0 is up, line protocol is up
  Hardware is cyBus PODS3 Serial
  Internet address is 172.18.1.1/24
  MTU 4470 bytes, BW 44736 Kbit, DLY 200 usec, rely 255/255, load 1/255
  Encapsulation HDLC, loopback not set, keepalive set (10 sec)
  Last input 00:00:05, output 00:00:02, output hang never
  Last clearing of "show interface" counters 5d02h
  Queueing strategy: fifo
  Output queue 0/40, 0 drops; input queue 0/75, 27269 drops
```

```
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
     79039 packets input, 14195344 bytes, 0 no buffer
     Received 84506 broadcasts, 0 runts, 0 giants
              0 parity
     9574 input errors, 6714 CRC, 0 frame, 1 overrun, 0 ignored, 2859 abort
     62472 packets output, 13751644 bytes, 0 underruns
     0 output errors, 0 applique, 10 interface resets
     0 output buffer failures, 0 output buffers swapped out
     16 carrier transitions
   rxLOS inactive, rxLOF inactive, rxAIS inactive
   txAIS inactive, rxRAI inactive, txRAI inactive
```

The table below describes significant fields shown in the display that are different from the fields described in the tables above.

Table 37: show interfaces serial Field Descriptions--PA-T3

Field	Description
Last clearing of “show interface” counters	Time the counters were last cleared.
Queueing strategy	First-in, first-out queueing strategy (other queueing strategies that you might see are priority-list, custom-list, and weighted fair).
parity	Number of the parity errors on the interface.
applique	Indicates that an unrecoverable error has occurred on the T3 applique. The router then invokes an interface reset.
output buffer failures	Number of “no resource” errors received on the output.
output buffers swapped out	Number of packets swapped to DRAM.
rxLOS, rxLOF, rxAIS	Receive loss of signal, loss of frame, and alarm indication signal status. Values are inactive or active.
txAIS, rxRAI, txRAI	Transmit alarm indication signal, receive remote alarm indicator, and transmit remote alarm indicator status. Values are inactive or active. When the router receives an LOS, LOF, or AIS, the txRAI is active. When the remote router receives an LOS, LOF, or AIS, the rxRAI is active.

Example of CT3IP Serial Interface

The following is sample output from the **showinterfacesserial** command for the CT3IP serial interface:

```
Router# show interfaces serial 3/0/0:25
Serial3/0/0:25 is up, line protocol is up
  Hardware is cyBus T3
  Internet address is 10.25.25.2/24
  MTU 1500 bytes, BW 1536 Kbit, DLY 20000 usec, rely 255/255, load 12/255
  Encapsulation HDLC, loopback not set, keepalive not set
  Last input 00:19:01, output 00:11:49, output hang never
```

```
  Last clearing of "show interface" counters 00:19:39
  Input queue: 0/75/0 (size/max/drops); Total output drops: 0
  Queueing strategy: weighted fair
  Output queue: 0/64/0 (size/threshold/drops)
     Conversations 0/1 (active/max active)
     Reserved Conversations 0/0 (allocated/max allocated)
  5 minute input rate 69000 bits/sec, 90 packets/sec
  5 minute output rate 71000 bits/sec, 90 packets/sec
     762350 packets input, 79284400 bytes, 0 no buffer
     Received 0 broadcasts, 0 runts, 0 giants
     150 input errors, 0 CRC, 0 frame, 150 overrun, 0 ignored, 0 abort
     763213 packets output, 80900472 bytes, 0 underruns
     0 output errors, 0 collisions, 0 interface resets
     0 output buffer failures, 0 output buffers swapped out
     0 carrier transitions no alarm present
  Timeslot(s) Used:1-24, Transmitter delay is 0 flags, transmit queue length 5
  non-inverted data
```

The table below describes significant fields relevant to the CT3IP shown in the display that are different from the fields described in the tables above.

*Table 38: **show interfaces serial** Field Descriptions--CT3IP*

Field	Description
Timeslot(s) Used	Number of time slots assigned to the T1 channel.
Transmitter delay	Number of idle flags inserted between each HDLC frame.
transmit queue length	Number of packets allowed in the transmit queue.
non-inverted data	Indicates whether or not the interface is configured for inverted data.

Example of an HDLC Synchronous Serial Interface on a Cisco 7500 Series Router

The following is sample output from the **showinterfacesserial** command for an HDLC synchronous serial interface on a Cisco 7500 series router:

```
Router# show interfaces serial 1/0
Serial1/0 is up, line protocol is up
  Hardware is cxBus Serial
  Internet address is 172.19.190.203, subnet mask is 255.255.255.0
  MTU 1500 bytes, BW 1544 Kbit, DLY 20000 usec, rely 255/255, load 1/255
  Encapsulation HDLC, loopback not set, keepalive set (10 sec)
  Last input 0:00:07, output 0:00:00, output hang never
  Last clearing of "show interface" counters 2w4d
  Output queue 0/40, 0 drops; input queue 0/75, 0 drops
  Five minute input rate 0 bits/sec, 0 packets/sec
  Five minute output rate 0 bits/sec, 0 packets/sec
     16263 packets input, 1347238 bytes, 0 no buffer
     Received 13983 broadcasts, 0 runts, 0 giants
     2 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 2 abort
     22146 packets output, 2383680 bytes, 0 underruns
     0 output errors, 0 collisions, 2 interface resets, 0 restarts
     1 carrier transitions
```

The tables above describes significant fields shown in the display.

Example of HDLC Encapsulation

The following example displays High-Level Data Link Control (HDLC) encapsulation on serial interface 0:

```
Router# show interfaces serial 0
Serial0 is up, line protocol is up (looped)
Hardware is HD64570
Internet address is 10.1.1.1, subnet mask is 255.255.255.0
MTU 1500 bytes, BW 1544 Kbit, DLY 20000 usec, rely 255/255, load 1/255
Encapsulation HDLC, loopback set, keepalive set (10 sec)
```

The tables above describes significant fields shown in the display.

Example of a G.703 Interface with Framing

The following is sample output from the **showinterfacesserial** command for a G.703 interface on which framing is enabled:

```
Router# show interfaces serial 2/3
Serial2/3 is up, line protocol is up
  Hardware is cxBus Serial
  Internet address is 10.4.4.1, subnet mask is 255.255.255.0
  MTU 1500 bytes, BW 1544 Kbit, DLY 20000 usec, rely 255/255, load 1/255
  Encapsulation HDLC, loopback not set, keepalive not set
  Last input 0:00:21, output 0:00:21, output hang never
  Last clearing of "show interface" counters never
  Output queue 0/40, 0 drops; input queue 0/75, 0 drops
  Five minute input rate 0 bits/sec, 0 packets/sec
  Five minute output rate 0 bits/sec, 0 packets/sec
     53 packets input, 7810 bytes, 0 no buffer
     Received 53 broadcasts, 0 runts, 0 giants
     2 input errors, 2 CRC, 0 frame, 0 overrun, 0 ignored, 2 abort
     56 packets output, 8218 bytes, 0 underruns
     0 output errors, 0 collisions, 2 interface resets, 0 restarts
     1 carrier transitions
     2 alarm indications, 333 remote alarms, 332 rx LOF, 0 rx LOS
     RTS up, CTS up, DTR up, DCD up, DSR up
     BER inactive, NELR inactive, FELR inactive
```

The tables above describes significant fields shown in the display.

Example with Frame Relay Encapsulation

When using Frame Relay encapsulation, use the **showinterfacesserial**command to display information on the multicast data-link connection identifier (DLCI), the DLCI of the interface, and the DLCI used for the local management interface (LMI).

The multicast DLCI and the local DLCI can be set using the **frame-relaymulticast-dlci** and **frame-relaylocal-dlci** configuration commands. The status information is taken from the LMI, when active.

The following is sample output from the **showinterfacesserial** command when Frame Relay encapsulation and LMI are enabled:

```
Router# show interfaces serial
Serial 2 is up, line protocol is up
   Hardware type is MCI Serial
   Internet address is 172.20.122.1, subnet mask is 255.255.255.0
   MTU 1500 bytes, BW 1544 Kbit, DLY 20000 usec, rely 255/255, load 1/255
   Encapsulation FRAME-RELAY, loopback not set, keepalive set (10 sec)
   multicast DLCI 1022, status defined, active
   source DLCI    20, status defined, active
   LMI DLCI 1023, LMI sent 10, LMI stat recvd 10, LMI upd recvd 2
   Last input 7:21:29, output 0:00:37, output hang never
   Output queue 0/100, 0 drops; input queue 0/75, 0 drops
   Five minute input rate 0 bits/sec, 0 packets/sec
   Five minute output rate 0 bits/sec, 0 packets/sec
       47 packets input, 2656 bytes, 0 no buffer
       Received 5 broadcasts, 0 runts, 0 giants
       5 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 57 abort
       518 packets output, 391205 bytes
       0 output errors, 0 collisions, 0 interface resets, 0 restarts
       1 carrier transitions
```

In this display, the multicast DLCI has been changed to 1022 using the **frame-relaymulticast-dlci** interface configuration command.

The display shows the statistics for the LMI as the number of status inquiry messages sent (LMI sent), the number of status messages received (LMI recvd), and the number of status updates received (upd recvd). Refer to the Frame Relay Interface specification for additional explanations of this output.

Example with Frame Relay Queueing and Fragmentation at the Interface

The default mode for Frame Relay interfaces on serial SPAs is transparent mode. When FRF.12 configuration is applied to these SPA interfaces, then the SPA interface mode changes to end-to-end.

With end-to-end configuration on CEs, L2VPN cloud on GSR PEs can transparently forward the FRF.12 fragments to remote CE by default. In case of L2VPN on Cisco 12000 series Internet router, FRF.12 configuration should not be applied on the main or sub-interfaces of SPA interfaces. Otherwise the FRF.12 fragments get dropped in ingress interface on SPA on the ingress PE.

For L3VPN to work on Cisco 12000 series Internet router, FRF.12 configuration needs to be applied to the L3VPN SPA interface (main or sub-interface). L3VPN will not work without FRF.12 configuration.

L2VPN requires the SPA interface to be in transparent mode. L3VPN requires the SPA interface to be in end-to-end mode. At physical interface level, either L2VPN or L3VPN works at a time. Both L2VPN and L3VPN will not work simultaneously on a single physical interface. FRF.12 configuration applied on a L3VPN sub-interface, changes the mode of the entire physical interface to end-to-end and all L2VPN sub-interface traffic on this physical interface gets dropped.

If L2VPN circuits are already present on a SPA interface and FRF.12 configuration is applied on this interface, then the following error message will be displayed to indicate FRF.12 fragment drops on L2VPN circuits.

SLOT 3:2d08h: %GLCFR-3-FR_MODE: (bflc_fr_xdr_cmd_vc_status)FRF12 fragments will be dropp

The following is sample output from the **showinterfacesserial** command when low-latency queueing and FRF.12 end-to-end fragmentation are configured on a Frame Relay interface:

```
Router# show interfaces serial 3/2
Serial3/2 is up, line protocol is up
  Hardware is M4T
  MTU 1500 bytes, BW 1544 Kbit, DLY 20000 usec,
     reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation FRAME-RELAY, crc 16, loopback not set
  Keepalive set (10 sec)
  LMI enq sent  0, LMI stat recvd 0, LMI upd recvd 0, DTE LMI up
  LMI enq recvd 0, LMI stat sent  0, LMI upd sent  0
  LMI DLCI 1023  LMI type is CISCO  frame relay DTE
  Fragmentation type: end-to-end, size 80, PQ interleaves 0
  Broadcast queue 0/64, broadcasts sent/dropped 0/0, interface broadcasts 0
  Last input 2d15h, output 2d15h, output hang never
  Last clearing of "show interface" counters 00:01:31
  Input queue: 0/75/0/0 (size/max/drops/flushes); Total output drops: 0
  Queueing strategy: weighted fair
  Output queue: 0/1000/64/0 (size/max total/threshold/drops)
     Conversations  0/0/256 (active/max active/max total)
     Reserved Conversations 0/0 (allocated/max allocated)
     Available Bandwidth 1094 kilobits/sec
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
     0 packets input, 0 bytes, 0 no buffer
     Received 0 broadcasts, 0 runts, 0 giants, 0 throttles
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     0 packets output, 0 bytes, 0 underruns
     0 output errors, 0 collisions, 1 interface resets
     0 output buffer failures, 0 output buffers swapped out
     1 carrier transitions     DCD=up  DSR=up  DTR=up  RTS=up  CTS=up
```

The table below describes significant fields shown in the display that are different from the fields described in the tables above.

*Table 39: **show interfaces serial** Field Descriptions--Frame Relay Interface Queueing and Fragmentation*

Field	Description
txload	Interface load in the transmit direction.
rxload	Interface load in the receive direction.
crc	Length the cyclic redundancy check (CRC) used on the interface.
LMI enq sent	Number of Frame Relay status inquiry messages sent.
LMI stat recvd	Number of Frame Relay status request messages received.
LMI upd recvd	Number of single PVC asynchronous status messages received.
DTE LMI up	LMI peers are synchronized.
LMI enq recvd	Number of Frame Relay status inquiry messages received.
LMI stat sent	Number of Frame Relay status request messages sent.
LMI upd sent	Number of single PVC asynchronous status messages sent.
Fragmentation type	Type of fragmentation: end-to-end, Cisco, or VoFR

Field	Description
size	Fragmentation size.
PQ interleaves	Number of priority queue frames that have interleaved data fragments.
Broadcast queue	Number on queue/queue depth.
broadcasts sent/dropped	Number of broadcasts sent and dropped.
interface broadcasts	Number of broadcasts sent on interface.
Input queue	size--Current size of the input queue. max--Maximum size of the queue. drops--Number of messages discarded. flushes--Number of times that data on queue has been discarded.
Queueing strategy	Type of queueing configured on the interface.
Output queue	size--Current size of the output queue. max total--Maximum number of frames that can be queued. threshold--Congestive-discard threshold. Number of messages in the queue after which new messages for high-bandwidth conversations are dropped. drops--Number of dropped messages.
Conversations	active--Number of currently active conversations. max active--Maximum number of conversations that have ever occurred at one time. max total--Maximum number of active conversations allowed.
throttles	Number of times the receiver on the port was disabled, possibly because of processor or buffer overload.
output buffer failures	Number of “no resource” errors received on the output.
output buffers swapped out	Number of packets swapped to DRAM.

Example with ANSI LMI

For a serial interface with the ANSI Local Management Interface (LMI) enabled, use the **showinterfacesserial**command to determine the LMI type implemented. The following is sample output from the **showinterfacesserial**command for a serial interface with the ANSI LMI enabled:

```
Router# show interfaces serial
Serial 1 is up, line protocol is up
   Hardware is MCI Serial
   Internet address is 172.18.121.1, subnet mask is 255.255.255.0
   MTU 1500 bytes, BW 1544 Kbit, DLY 20000 usec, rely 255/255, load 1/255
   Encapsulation FRAME-RELAY, loopback not set, keepalive set
   LMI DLCI    0, LMI sent 10, LMI stat recvd 10
   LMI type is ANSI Annex D
   Last input 0:00:00, output 0:00:00, output hang never
   Output queue 0/40, 0 drops; input queue 0/75, 0 drops


   Five minute input rate 0 bits/sec, 1 packets/sec
   Five minute output rate 1000 bits/sec, 1 packets/sec
       261 packets input, 13212 bytes, 0 no buffer
```

```
Received 33 broadcasts, 0 runts, 0 giants
0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
238 packets output, 14751 bytes, 0 underruns
0 output errors, 0 collisions, 0 interface resets, 0 restarts
```

Notice that the **showinterfacesserial**output for a serial interface with ANSI LMI shown in this display is very similar to that for encapsulation set to Frame Relay, as shown in the previous display. The table below describes the few differences that exist.

Table 40: show interfaces serial Field Descriptions--ANSI LMI

Field	Description
LMI DLCI 0	Identifies the DLCI used by the LMI for this interface. The default is 1023.
LMI sent 10	Number of LMI packets that the router sent.
LMI type is ANSI Annex D	Indicates that the interface is configured for the ANSI-adopted Frame Relay specification T1.617 Annex D.

Example with LAPB Encapsulation

Use the **showinterfacesserial**command to display operation statistics for an interface that uses Link Access Procedure, Balanced (LAPB) encapsulation. The following is partial sample output from the **showinterfacesserial** command for a serial interface that uses LAPB encapsulation:

```
Router# show interfaces serial 1
LAPB state is SABMSENT, T1 3000, N1 12056, N2 20, k7,Protocol ip
VS 0, VR 0, RCNT 0, Remote VR 0, Retransmissions 2
IFRAMEs 0/0 RNRs 0/0 REJs 0/0 SABMs 3/0 FRMRs 0/0 DISCs 0/0
```

The table below shows the fields relevant to all LAPB connections.

Table 41: show interfaces serial Field Descriptions--LAPB

Field	Description
LAPB state is	State of the LAPB protocol.
T1 3000, N1 12056, ...	Current parameter settings.
Protocol	Protocol encapsulated on a LAPB link; this field is not present on interfaces configured for multiprotocol LAPB or X.25 encapsulations.
VS	Modulo 8 frame number of the next outgoing information frame.
VR	Modulo 8 frame number of the next information frame expected to be received.
RCNT	Number of received information frames that have not yet been acknowledged.
Remote VR	Number of the next information frame that the remote device expects to receive.
Retransmissions	Count of current retransmissions because of expiration of T1.

Field	Description
Window is closed	No more frames can be transmitted until some outstanding frames have been acknowledged. This message should be displayed only temporarily.
IFRAMEs	Count of information frames in the form of sent/received.
RNRs	Count of Receiver Not Ready frames in the form of sent/received.
REJs	Count of Reject frames in the form of sent/received.
SABMs	Count of Set Asynchronous Balanced Mode commands in the form of sent/received.
FRMRs	Count of Frame Reject frames in the form of sent/received.
DISCs	Count of Disconnect commands in the form of sent/received.

Example with PPP Encapsulation

The output for an interface configured for synchronous PPP encapsulation differs from the standard **showinterfacesserial** output. An interface configured for PPP might include the following information:

```
Router# show interfaces serial 1
lcp state = OPEN
ncp ipcp state = OPEN   ncp osicp state = NOT NEGOTIATED
ncp ipxcp state = NOT NEGOTIATED   ncp deccp state = NOT NEGOTIATED
ncp bridgecp state = NOT NEGOTIATED   ncp atalkcp state = NOT NEGOTIATED
```

The table below show the fields relevant to PPP connections.

Table 42: show interfaces serial Field Descriptions--PPP Encapsulation

Field	Description
lcp state	Link Control Protocol.
ncp ipcp state	Network Control Protocol Internet Protocol Control Protocol.
ncp osicp state	Network Control Protocol OSI (CLNS) Control Protocol.
ncp ipxcp state	Network Control Protocol IPX (Novell) Control Protocol.
ncp deccp state	Network Control Protocol DECnet Control Protocol.
ncp bridgecp state	Network Control Protocol Bridging Control Protocol.
ncp atalkcp state	Network Control Protocol AppleTalk Control Protocol.

Example with SDLC Connections

Use the **showinterfacesserial**command to display the Synchronous Data Link Control (SDLC) information for a given SDLC interface. The following is sample output from the **showinterfacesserial**command for an SDLC primary interface that supports the SDLLC function:

```
Router# show interfaces serial
Serial 0 is up, line protocol is up
Hardware is MCI Serial
MTU 1500 bytes, BW 1544 Kbit, DLY 20000 usec, rely 255/255, load 1/255
Encapsulation SDLC-PRIMARY, loopback not set
    Timers (msec): poll pause 100 fair poll 500. Poll limit 1
    [T1 3000, N1 12016, N2 20, K 7] timer: 56608 Last polled device: none
    SDLLC [ma: 0000.0C01.14--, ring: 7 bridge: 1, target ring: 10
              largest token ring frame 2052]
SDLC addr C1 state is CONNECT
     VS 6, VR 3, RCNT 0, Remote VR 6, Current retransmit count 0
     Hold queue: 0/12 IFRAMEs 77/22 RNRs 0/0 SNRMs 1/0 DISCs 0/0
     Poll: clear, Poll count: 0, chain: p: C1 n: C1
     SDLLC [largest SDLC frame: 265, XID: disabled]
 Last input 00:00:02, output 00:00:01, output hang never
 Output queue 0/40, 0 drops; input queue 0/75, 0 drops
 Five minute input rate 517 bits/sec, 30 packets/sec
 Five minute output rate 672 bits/sec, 20 packets/sec
     357 packets input, 28382 bytes, 0 no buffer
     Received 0 broadcasts, 0 runts, 0 giants
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     926 packets output, 77274 bytes, 0 underruns
     0 output errors, 0 collisions, 0 interface resets, 0 restarts
     2 carrier transitions
```

The table below shows the fields relevant to all SDLC connections.

Table 43: show interfaces serial Field Descriptions--SDLC Enabled

Field	Description
Timers (msec): poll pause, fair poll, Poll limit	Current values of these timers for the primary SDLC interface.
T1, N1, N2, K	Values for these parameters for the primary SDLC interface.

The table below shows other data given for each SDLC secondary interface configured to be attached to the serial interface.

Table 44: SDLC Secondary Interface Descriptions

Field	Description
addr	Address of this SDLC secondary interface.

Field	Description
state is	Current state of this connection, which is one of the following: • DISCONNECT--No communication is being attempted to this secondary. • CONNECT--A normal connect state exists between this router and this secondary. • DISCSENT--This router has sent a disconnect request to this secondary and is awaiting its response. • SNRMSENT--This router has sent a connect request (SNRM) to this secondary and is awaiting its response. • THEMBUSY--This secondary has told this router that it is temporarily unable to receive any more information frames. • USBUSY--This router has told this secondary that it is temporarily unable to receive any more information frames. • BOTHBUSY--Both sides have told each other that they are temporarily unable to receive any more information frames. • ERROR--This router has detected an error and is waiting for a response from the secondary acknowledging this.
VS	Sequence number of the next information frame that this station sends.
VR	Sequence number of the next information frame from this secondary that this station expects to receive.
Remote VR	Last frame transmitted by this station that has been acknowledged by the other station.
Current retransmit count:	Number of times the current I-frame or sequence of I-frames has been retransmitted.
Hold Queue	Number of frames in hold queue and maximum size of hold queue.
IFRAMEs, RNRs, SNRMs, DISCs	Sent/received count for these frames.
Poll	“Set” if this router has a poll outstanding to the secondary; “clear” if it does not.
Poll Count	Number of polls in a row that have been given to this secondary at this time.
Chain	Shows the previous (p) and next (n) secondary address on this interface in the *roundrobinloop* of polled devices.

Example with SDLLC

Use the **showinterfacesserial**command to display the SDLLC statistics for SDLLC-configured interfaces. The following is sample output from the **showinterfacesserial**command for a serial interface configured for SDLLC:

```
Router# show interfaces serial
Serial 0 is up, line protocol is up
   Hardware is MCI Serial
   MTU 1500 bytes, BW 1544 Kbit, DLY 20000 usec, rely 255/255, load 1/255
   Encapsulation SDLC-PRIMARY, loopback not set
       Timers (msec): poll pause 100 fair poll 500. Poll limit 1
       [T1 3000, N1 12016, N2 20, K 7] timer: 56608 Last polled device: none
       SDLLC [ma: 0000.0C01.14--, ring: 7 bridge: 1, target ring: 10
              largest token ring frame 2052]
   SDLC addr C1 state is CONNECT
       VS 6, VR 3, RCNT 0, Remote VR 6, Current retransmit count 0
       Hold queue: 0/12 IFRAMEs 77/22 RNRs 0/0 SNRMs 1/0 DISCs 0/0
       Poll: clear, Poll count: 0, chain: p: C1 n: C1
       SDLLC [largest SDLC frame: 265, XID: disabled]
   Last input 00:00:02, output 00:00:01, output hang never
   Output queue 0/40, 0 drops; input queue 0/75, 0 drops
   Five minute input rate 517 bits/sec, 30 packets/sec
   Five minute output rate 672 bits/sec, 20 packets/sec
       357 packets input, 28382 bytes, 0 no buffer
       Received 0 broadcasts, 0 runts, 0 giants
       0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
       926 packets output, 77274 bytes, 0 underruns
       0 output errors, 0 collisions, 0 interface resets, 0 restarts
       6608 Last polled device: none
       SDLLC [ma: 0000.0C01.14--, ring: 7 brid2 carrier transitions
```

Most of the output shown in the display is generic to all SDLC-encapsulated interfaces and is described in the *CiscoIOS Bridging and IBM Networking Command Reference* , *Volume 2 of 2: IBM Networking* . The table below shows the parameters specific to SDLLC.

Table 45: SDLLC Parameter Descriptions

Field	Description
SDLLC ma	Lists the MAC address configured for this interface. The last byte is shown as "--" to indicate that it is filled in with the SDLC address of the connection.
ring, bridge, target ring	Lists the parameters as configured by the **sdllctraddr**command.
largest token ring frame	Shows the largest Token Ring frame that is accepted on the Logical Link control, type 2 (LLC2) side of the connection.
largest SDLC frame	Shows the largest SDLC frame that is accepted and will be generated on the SDLC side of the connection.
XID	Enabled or disabled: Shows whether XID processing is enabled on the SDLC side of the connection. If enabled, it will show the XID value for this address.

Example with X.25

The following is partial sample output from the **showinterfacesserial**command for a serial X.25 interface:

```
Router# show interfaces serial 1
X25 address 000000010100, state R1, modulo 8, idle 0, timer 0, nvc 1
  Window size: input 2, output 2, Packet size: input 128, output 128
  Timers: T20 180, T21 200, T22 180, T23 180, TH 0
  Channels: Incoming-only none, Two-way 1-1024, Outgoing-only none
(configuration on RESTART: modulo 8,
  Window size: input 2 output 2, Packet size: input 128, output 128
  Channels: Incoming-only none, Two-way 5-1024, Outgoing-only none)
  RESTARTs 3/2 CALLs 1000+2/1294+190/0+0/ DIAGs 0/0
```

The stability of the X.25 protocol requires that some parameters not be changed without a restart of the protocol. Any change to these parameters is held until a restart is sent or received. If any of these parameters changes, information about the router configuration at restart will be displayed as well as the values that are currently in effect.

The table below describes significant fields shown in the display.

Table 46: show interfaces serial Field Descriptions--X.25 Enabled

Field	Description
X25 address	Address used to originate and accept calls.
state	State of the interface. Possible values follow: • R1 is the normal ready state. • R2 is the DTE restarting state. • R3 is the DCE restarting state. If the state is R2 or R3, the interface is awaiting acknowledgment of a Restart packet.
modulo	Modulo value; determines the packet sequence numbering scheme used.
idle	Number of minutes for which the Cisco IOS software waits before closing idle virtual circuits that it originated or accepted.
timer	Value of the interface timer, which is zero unless the interface state is R2 or R3.
nvc	Default maximum number of simultaneous virtual circuits permitted to and from a single host for a particular protocol.
Window size: input, output	Default window sizes (in packets) for the interface. The **x25facility** interface configuration command can be used to override these default values for the switched virtual circuits originated by the router.
Packet size: input, output	Default maximum packet sizes (in bytes) for the interface. The **x25facility** interface configuration command can be used to override these default values for the switched virtual circuits originated by the router.

Field	Description
Timers:	Values of the X.25 timers: • T10 through T13 for a DCE device • T20 through T23 for a DTE device
TH	Packet acknowledgment threshold (in packets). This value determines how many packets are received before an explicit acknowledgment is sent. The default value (0) sends an explicit acknowledgment only when the incoming window is full.
Channels: Incoming-only, Two-way, Outgoing-only	Displays the virtual circuit ranges for this interface.
RESTARTs	Shows Restart packet statistics for the interface using the format Sent/Received.
CALLs	Successful calls sent + failed calls/calls received + calls failed/calls forwarded + calls failed. Calls forwarded are counted as calls sent.
DIAGs	Diagnostic messages sent and received.

Example with Accounting Option

The following example illustrates the **showinterfacesserial** command with the **accounting** option on a Cisco 7500 series routers:

```
Router# show interfaces serial 1/0 accounting
Serial1/0
       Protocol    Pkts In   Chars In   Pkts Out  Chars Out
             IP       7344    4787842       1803    1535774
      Appletalk      33345    4797459      12781    1089695
        DEC MOP          0          0        127       9779
            ARP          7        420         39       2340
```

The table below describes thefields shown in the display.

*Table 47: **show interfaces serial** Field Descriptions--Accounting*

Field	Description
Protocol	Protocol that is operating on the interface.
Pkts In	Number of packets received for that protocol.
Chars In	Number of characters received for that protocol.
Pkts Out	Number of packets transmitted for that protocol.
Chars Out	Number of characters transmitted for that protocol.

Example with Cisco AS5800 Access Server

The following example shows the activity that occurred on the serial interface in shelf 1, slot 4, port 0 for time slot 2 in group 23:

```
Router# show interfaces serial 1/4/0:2:23
Serial1/4/0:2:23 is up, line protocol is up (spoofing)
 Hardware is DS-T1
 MTU 1500 bytes, BW 64 Kbit, DLY 20000 usec, rely 255/255, load 1/255
 Encapsulation HDLC, loopback not set
 Last input 00:00:01, output 00:00:01, output hang never
 Last clearing of "show interface" counters 22:24:30
 Queueing strategy: fifo
 Output queue 0/40, 0 drops; input queue 0/75, 0 drops
 5 minute input rate 0 bits/sec, 0 packets/sec
 5 minute output rate 0 bits/sec, 0 packets/sec
     5274 packets input, 20122 bytes, 0 no buffer
     Received 0 broadcasts, 0 runts, 0 giants, 0 throttles
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     5274 packets output, 30836 bytes, 0 underruns
     0 output errors, 0 collisions, 0 interface resets
     0 output buffer failures, 0 output buffers swapped out
     2 carrier transitions no alarm present
 Timeslot(s) Used:24, subrate: 64Kb/s, transmit delay is 0 flags
```

The table below describes the significant fields shown in thedisplay that are different from the fields described in the tables above.

Table 48: show interfaces serial Command Field Descriptions--Cisco AS5800

Field	Description
Last clearing of “show interface” counters	Time at which the counters that measure cumulative statistics (such as number of bytes transmitted and received) were last reset to zero.
Queueing strategy	Displays the type of queueing configured for this interface. In the example output, the type of queueing configured is FIFO.
throttles	Number of times that the receiver on the port was disabled, possibly because of buffer or processor overload.
output buffer failures	Number of times that the output buffer has failed.
output buffer swapped out	Number of times that the output buffer has been swapped out.
Timeslot(s) Used	Number of time slots assigned to the T1 channel.
subrate	Bandwidth of each time slot.
transmit delay is ...	Number of idle flags inserted between each frame.

Related Commands

Command	Description
show controllers serial	Displays information about the virtual serial interface.

show interfaces sm

To display status, traffic data, and configuration information about the SM-SRE service module interface, use the **showinterfacessm** command in user EXEC or privileged EXEC mode.

show interfaces sm *slot*/*port*

Syntax Description

slot	Router slot in which the service module is installed. Range: 1 to 4.
/ *port*	Port number of the module interface. The slash mark (/) is required.

Command Modes

User EXEC (>) Privileged EXEC (#)

Command History

Release	Modification
15.0(1)M	This command was introduced.

Usage Guidelines

The service module interface is the Gigabit Ethernet interface on the router that connects to the SM-SRE.

Examples

The following example displays status, traffic data, and configuration information about the interface to the SM-SRE installed in the router.

```
Router# show interfaces sm 1/0
SM1/0 is up, line protocol is up
  Hardware is PSE2, address is 001e.4a97.644d (bia 001e.4a97.644d)
  Internet address is 30.0.0.1/24
  MTU 1500 bytes, BW 1000000 Kbit/sec, DLY 10 usec,
     reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation ARPA, loopback not set
  Keepalive set (10 sec)
  Full-duplex, 1000Mb/s, media type is internal
  output flow-control is XON, input flow-control is XON
  ARP type: ARPA, ARP Timeout 04:00:00
  Last input 00:00:13, output 00:00:04, output hang never
  Last clearing of "show interface" counters never
  Input queue: 0/75/0/0 (size/max/drops/flushes); Total output drops: 0
  Queueing strategy: fifo
  Output queue: 0/60 (size/max)
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
     22 packets input, 1398 bytes, 0 no buffer
     Received 3 broadcasts, 0 runts, 0 giants, 0 throttles
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored
     0 watchdog, 0 multicast, 0 pause input
     0 input packets with dribble condition detected
     134 packets output, 42720 bytes, 0 underruns
     0 output errors, 0 collisions, 0 interface resets
     0 unknown protocol drops
     0 unknown protocol drops
     0 babbles, 0 late collision, 0 deferred
     0 lost carrier, 0 no carrier, 0 pause output
     0 output buffer failures, 0 output buffers swapped out
```

The table below describes the significant fields shown in the display.

Table 49: show interfaces sm Field Descriptions

Field	Description
Hardware, address	Hardware type and address.
MTU	Maximum transmission unit (MTU) of the service module interface.
BW	Bandwidth of the interface, in kbps.
DLY	Delay of the interface, in microseconds.
reliability	Reliability of the interface as a fraction of 255 (255/255 is 100 percent reliability), calculated as an exponential average over 5 minutes.
txload	Transmit load on the interface as a fraction of 255 (255/255 is completely saturated), calculated as an exponential average over 5 minutes.
rxload	Receive load on the interface as a fraction of 255 (255/255 is completely saturated), calculated as an exponential average over 5 minutes.
Encapsulation	Encapsulation method assigned to the interface.
loopback	Indicates whether or not loopback is set.
Keepalive	Indicates whether or not keepalives are set and the interval between keepalives if they have been set.
ARP type...ARP Timeout	Type of Address Resolution Protocol (ARP) assigned and length of timeout.
Last input	Number of hours, minutes, and seconds since the last packet was successfully received by the interface and processed locally on the router. This field is useful for detecting when a dead interface failed. **Note** This field is not updated by fast-switched traffic.
output	Number of hours, minutes, and seconds since the last packet was successfully transmitted by the interface. This field is useful for detecting when a dead interface failed.
output hang	Number of hours, minutes, and seconds (or never) since the interface was last reset because a transmission took too long. When the number of hours in any of the “last” fields exceeds 24 hours, the number of days and hours is printed. If that field overflows, asterisks are printed.
Last clearing	Time at which the counters that measure cumulative statistics (such as number of bytes transmitted and received) shown in this report were last reset to zero. Note that variables that might affect routing (for example, load and reliability) are not cleared when the counters are cleared. Asterisks (***) indicate that the elapsed time is too large to be displayed.

Field	Description
Input queue	Number of packets in the input queue. Each number is followed by a slash, the maximum size of the queue, the number of packets dropped because of a full queue, and the number of times that queued packets have been discarded.
Total output drops	Number of packets in the output queue that have been dropped because of a full queue.
Queueing strategy	Queueing strategy applied to the interface, which is configurable under the interface. The default is FIFO (first-in, first-out).
Output queue	Number of packets in the output queue, and the maximum size of the queue. Each number is followed by a slash.
5 minute input rate, 5 minute output rate	Average number of bits and packets transmitted per second in the last 5 minutes. If the interface is not in promiscuous mode, it senses network traffic that it sends and receives (rather than all network traffic). The 5-minute input and output rates should be used only as an approximation of traffic per second during a given 5-minute period. These rates are exponentially weighted averages with a time constant of 5 minutes. A period of four time constants must pass before the average will be within 2 percent of the instantaneous rate of a uniform stream of traffic over that period. **Note** The 5-minute period referenced in this output is a load interval that is configurable under the interface. The default value is 5 minutes.
packets input	Total number of error-free packets received by the system.
bytes	Total number of bytes, including data and MAC encapsulation, in the error-free packets received by the system.
no buffer	Number of received packets discarded because there was no buffer space in the main system. Compare with ignored count. Broadcast storms on Ethernets and bursts of noise on serial lines are often responsible for no input buffer events.
Received...broadcasts	Number of broadcasts received.
runts	Number of packets that are discarded because they are smaller than the minimum packet size of the medium. For instance, any Ethernet packet that is less than 64 bytes is considered a runt.
giants	Number of packets that are discarded because they exceed the maximum packet size of the medium. For example, any Ethernet packet that is greater than 1518 bytes is considered a giant.
throttles	Number of times that the interface requested another interface within the router to slow down.

Field	Description
input errors	Errors that include runts, giants, no buffer, cyclic redundancy checksum (CRC), frame, overrun, and ignored counts. Other input-related errors can also cause the input errors count to be increased, and some datagrams may have more than one error; therefore, this sum may not balance with the sum of enumerated input error counts.
CRC	Errors created when the CRC generated by the originating LAN station or far-end device does not match the checksum calculated from the data received. On a LAN, this usually indicates noise or transmission problems on the LAN interface or the LAN bus itself. A high number of CRCs is usually the result of collisions or a station that is transmitting bad data.
frame	Number of packets received incorrectly that have a CRC error and a noninteger number of octets. On a LAN, this is usually the result of collisions or a malfunctioning Ethernet device.
overrun	Number of times that the receiver hardware was unable to hand received data to a hardware buffer because the input rate exceeded the receiver's ability to handle the data.
ignored	Number of received packets that were ignored by the interface because the interface hardware ran low on internal buffers. These buffers are different from system buffer space described. Broadcast storms and bursts of noise can cause the ignored count to increase.
input packets with dribble condition detected	Number of packets with dribble condition. Dribble bit error indicates that a frame is slightly too long. This frame error counter is incremented just for informational purposes; the router accepts the frame.
packets output	Total number of messages that have been transmitted by the system.
bytes	Total number of bytes, including data and MAC encapsulation, that have been transmitted by the system.
underruns	Number of times that the transmitter has run faster than the router could handle. This may never be reported on some interfaces.
output errors	Sum of all errors that prevented the final transmission of datagrams out of the interface that is being examined. Note that this may not balance with the sum of the enumerated output errors, because some datagrams may have more than one error, and others may have errors that do not fall into any of the specifically tabulated categories.
collisions	Number of messages that have been retransmitted because of an Ethernet collision. This is usually the result of an overextended LAN (Ethernet or transceiver cable too long, more than two repeaters between stations, or too many cascaded multiport transceivers). A packet that collides is counted only once in output packets.

Field	Description
interface resets	Number of times an interface has been completely reset. This can happen if packets that were queued for transmission were not sent within several seconds. On a serial line, this can be caused by a malfunctioning modem that is not supplying the transmit clock signal or by a cable problem. If the system notices that the carrier detect line of a serial interface is up, but the line protocol is down, it periodically resets the interface in an effort to restart it. Interface resets can also occur when an interface is looped back or shut down.
babbles	Count of frames greater than 1518 bytes that have been transmitted, indicating that the transmitter has been on the interface longer than the time necessary to transmit the largest frame.
late collision	Number of late collisions. A collision becomes a late collision when it occurs after the preamble has been transmitted.
deferred	Deferred indicates that the chip, while ready to transmit a frame, had to defer because the carrier was asserted.
lost carrier	Number of times that the carrier was lost during transmission.
no carrier	Number of times that the carrier was not present during the transmission.
output buffer failures, output buffers swapped out	Number of failed buffers and number of buffers swapped out.

Related Commands

Command	Description
show controllers sm	Displays controller information for the service module interface.

show interfaces status

To display the interface status or a list of interfaces in an error-disabled state on local area network (LAN) ports only, use the **showinterfacesstatus** command in user EXEC or privileged EXEC mode.

show interfaces [*interface interface-number*] **status** [**err-disabled** | **module** *number* | **vlan** *vlan*]

Syntax Description

interface	(Optional) Interface type; possible valid values are **ethernet**, **fastethernet**, **gigabitethernet**, **tengigabitethernet**, **pos**, **atm**, and **ge-wan**.
interface-number	(Optional) Module and port number; see the "Usage Guidelines" section for valid values.
err-disabled	(Optional) Displays the LAN ports in an error-disabled state.
module *number*	(Optional) Specifies the module number; see the "Usage Guidelines" section for valid values.
vlan *vlan*	(Optional) Specifies a VLAN. Limits the display of switch port information to the specified VLAN. Range: 1 to 4094.

Command Default

This command has no default settings.

Command Modes

User EXEC Privileged EXEC

Command History

Release	Modification
12.2(14)SX	Support for this command was introduced on the Supervisor Engine 720.
12.2(17b)SXA	This command was changed to include the packet-buffer error status in the **showinterfacesstatuserr-disabled** output.
12.2(17d)SXB	Support for this command on the Supervisor Engine 2 was extended to Release 12.2(17d)SXB. This command was changed to include the type string of the receive-only transceivers.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(33)SXI	This command was changed to add the optional **vlan***vlan* keyword and argument.

Usage Guidelines

The *interface-number*argument designates the module and port number. Valid values for *interface-number* depend on the chassis and module that are used. For example, if you have a 48-port 10/100BASE-T Ethernet module that is installed in a 13-slot chassis, valid values for the slot number are from 1 to 13 and valid values for the port number are from 1 to 48.

This command is supported on LAN ports only.

The **module***number* keyword and argument designate the module number and limit the display to the interfaces on the module. Valid values depend on the chassis that is used. For example, if you have a 13-slot chassis, valid values for the module number are from 1 to 13.

To find out if an interface is inactive, enter the **showinterfacesstatus** command. If the interface is inactive, the Status field displays "inactive." If the port is not inactive, the Status field displays "none."

To find the packet and byte count, you can enter the **showinterfacescounters** command or the show **interfaces***interfaceinterface-number* status command. The **showinterfacescounters** command is the preferred command to use. In some cases, the packet and byte count of the show **interfaces***interfaceinterface-number* status command is incorrect.

Examples

This example shows how to display the status of all LAN ports:

```
Router>
show interfaces status
Port    Name               Status     Vlan       Duplex Speed Type
Gi1/1                      disabled   routed       full  1000 missing
Gi1/2                      notconnect 1            full  1000 unknown (4)
Fa5/1                      disabled   routed       auto  auto 10/100BaseTX
.
.
.
Port    Name               Status       Vlan       Duplex  Speed Type
Fa5/18                     disabled     1          auto    auto  10/100BaseTX
Fa5/19                     disabled     1          auto    auto  10/100BaseTX
Gi7/1                      disabled     1          full    1000  WDM-RXONLY
Gi7/2                      disabled     1          full    1000  No Transceiver
Router>
```

This example shows how to display the packet and byte count of a specific LAN port:

```
Router
> show interfaces fastethernet 5/2 status
FastEthernet5/2
Switching path    Pkts In   Chars In   Pkts Out  Chars Out
               Processor         17       1220         20       2020
             Route cache          0          0          0          0
       Distributed cache         17       1220  206712817 2411846570
                   Total         34       2440  206712837 2411848590
Router>
```

This example shows how to display the status of LAN ports in an error-disabled state:

```
Router>

show interfaces status
 err-disabled
Port    Name               Status       Reason
Fa9/4                      notconnect   link-flap
informational error message when the timer expires on a cause
-----------------------------------------------------------------
5d04h:%PM-SP-4-ERR_RECOVER:Attempting to recover from link-flap err-disable state on Fa9/4
Router>
```

Catalyst 6500 Series Switches

The following shows how to display the **showinterfacesstatus**for VLAN 2:

```
Router# show interfaces status vlan 2
```

Related Commands

Command	Description
errdisable detect cause	Enables the error-disable detection.
show errdisable recovery	Displays the information about the error-disable recovery timer.

show interfaces summary

To display a summary of statistics for one interface or for all interfaces that are configured on a networking device, use the **show interfaces summary** command in privileged EXEC mode. For Cisco 7600 series routers, the command can also be used in user EXEC mode.

show interfaces summary

Cisco 7600 Series
show interfaces [*type number*] **summary** [**vlan**]

Syntax Description

type	(Optional) Interface type; possible valid values are **ethernet**, **fastethernet**, **gigabitethernet**, **tengigabitethernet**, **pos**, **atm**, and **ge-wan**.
number	(Optional) Module and port number of the specified interface.
vlan	(Optional) Displays the total number of VLAN interfaces .

Command Default

This command has no default settings.

Command Modes

Privileged EXEC. User EXEC (Cisco 7600 series only)

Command History

Release	Modification
12.2	This command was introduced.
12.2(14)SX	Support for this command was introduced on the Supervisor Engine 720.
12.2(17d)SXB	Support for this command was introduced on the Supervisor Engine 2.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
IOS XE Release 3.9S	This command was integrated into Cisco IOS XE Release 3.9S.

Usage Guidelines

Cisco 7600 Series

On a Cisco 7600 series router, you can display summary information for a single interface by specifying the interface type and number. Separate counters for subinterfaces are not maintained and are not displayed in the output.

Examples

The following is sample output from the **show interfaces summary** command:

```
Router# show interfaces summary
 *: interface is up
 IHQ: pkts in input hold queue     IQD: pkts dropped from input queue
 OHQ: pkts in output hold queue    OQD: pkts dropped from output queue
 RXBS: rx rate (bits/sec)          RXPS: rx rate (pkts/sec)
 TXBS: tx rate (bits/sec)          TXPS: tx rate (pkts/sec)
 TRTL: throttle count
  Interface          IHQ   IQD  OHQ   OQD  RXBS RXPS  TXBS TXPS  TRTL
```

```
-------------------------------------------------------------------------
* FastEthernet0/0       0     0    0     0     0    0     0    0   0
  Serial0/0             0     0    0     0     0    0     0    0   0
  FastEthernet0/1       0     0    0     0     0    0     0    0   0
  Serial0/1             0     0    0     0     0    0     0    0   0
NOTE:No separate counters are maintained for subinterfaces
     Hence Details of subinterface are not shown.
```

This example shows how to display the total number of VLAN interfaces on a Cisco 7600 series router:

```
Router# show interfaces summary vlan
Total number of Vlan interfaces: 7
Vlan interfaces configured:
1,5,20,2000,3000-3001,4000
Router#
```

This example shows how to display the total number of VLAN interfaces on a Cisco 7600 series router:

```
Router# show interfaces summary vlan
Total number of Vlan interfaces: 7
Vlan interfaces configured:
1,5,20,2000,3000-3001,4000
Router#
```

This example shows how to display a summary of the interfaces on a Cisco 4400 Series Integrated Services Router.

```
#show interfaces summary

 *: interface is up
 IHQ: pkts in input hold queue     IQD: pkts dropped from input queue
 OHQ: pkts in output hold queue    OQD: pkts dropped from output queue
 RXBS: rx rate (bits/sec)          RXPS: rx rate (pkts/sec)
 TXBS: tx rate (bits/sec)          TXPS: tx rate (pkts/sec)
 TRTL: throttle count

  Interface                   IHQ        IQD       OHQ       OQD      RXBS      RXPS
TXBS      TXPS      TRTL
------------------------------------------------------------------------------------------------------------

  GigabitEthernet0/0/0          0          0         0         0         0         0
  0         0         0
  GigabitEthernet0/0/1          0          0         0         0         0         0
  0         0         0
  GigabitEthernet0/0/2          0          0         0         0         0         0
  0         0         0
  GigabitEthernet0/0/3          0          0         0         0         0         0
  0         0         0
* Serial1/0/0                   0          0         0         0         0         0
  0         0         0
* GigabitEthernet0              0          0         0         0     31000        60
  0         0         0
```

Related Commands

Command	Description
show interfaces	Displays the statistical information specific to interfaces.
show interfaces atm	Displays information about the ATM interfaces.
show interfaces ethernet	Displays information about the Ethernet interfaces.
show interfaces fastethernet	Displays information about the Fast Ethernet interfaces.
show interfaces serial	Displays information about the serial interfaces.

show interfaces switchport

To display the administrative and operational status of a switching (nonrouting) port, use the **showinterfacesswitchport** command in user EXEC or privileged EXEC mode.

show interfaces [*interface interface-number*] **switchport** [**brief**] [**module** *number*]

Syntax Description

interface	(Optional) Interface type; possible valid values are **ethernet**, **fastethernet**, **gigabitethernet**, **tengigabitethernet**, **pos**, **atm**, and **ge-wan**.
interface-number	(Optional) Module and port number; see the "Usage Guidelines" section for valid values.
brief	(Optional) Displays a brief summary of information.
module *number*	(Optional) Limits the display to interfaces on a specified module; see the "Usage Guidelines" section for valid values.

Command Default

This command has no default settings.

Command Modes

User EXEC Privileged EXEC

Command History

Release	Modification
12.2(14)SX	Support for this command was introduced on the Supervisor Engine 720.
12.2(17a)SX	The Administrative Trunking Encapsulation field was changed to dot1q EtherType.
12.2(17d)SXB	Support for this command on the Supervisor Engine 2 was extended to Release 12.2(17d)SXB.
12.2(18)SXE	This command was changed to include the **brief** keyword on the Supervisor Engine 720 only.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

Usage Guidelines

The *interface-number* designates the module and port number. Valid values depend on the chassis and module that are used. For example, if you have a 48-port 10/100BASE-T Ethernet module that is installed in a 13-slot chassis, valid values for the slot number are from 1 to 13 and valid values for the port number are from 1 to 48.

Examples

This example shows how to display switch-port information using the **include** output modifier:

```
Router>
show interfaces switchport
| include VLAN
Name: Fa5/6
Access Mode VLAN: 200 (VLAN0200)
Trunking Native Mode VLAN: 1 (default)
Trunking VLANs Enabled: ALL
Pruning VLANs Enabled: ALL
.
.
```

```
.
Router>
```

This example shows how to display the configurations of two multiple VLAN access ports:

```
Router>
show interfaces switchport
Name: Fa5/1
Switchport: Enabled
Administrative Mode: access
Operational Mode: access
Dot1q Ethertype: 0x8200
Operational Trunking Encapsulation: dot1q
Negotiation of Trunking: off
Access Mode VLAN: 100
Voice VLAN: 102
Trunking Native Mode VLAN: 1 (default)
Administrative private-vlan host-association: none
Administrative private-vlan mapping: 900 ((Inactive)) 901 ((Inactive))
Operational private-vlan: none
Trunking VLANs Enabled: ALL
Pruning VLANs Enabled: 2-1001
Capture Mode Disabled
Capture VLANs Allowed: ALL
Name: Fa5/2
Switchport: Enabled
Administrative Mode: access
Operational Mode: down
Dot1q Ethertype: 0x8200
Operational Trunking Encapsulation: native
Negotiation of Trunking: Off
Access Mode VLAN: 100
Voice VLAN: 103 ((inactive))
Trunking Native Mode VLAN: 1 (default)
.
.
.
```

This example shows how to display a brief summary of information:

```
Router> show interfaces switchport
 brief module 3
Port Status Op.Mode Op.Encap Channel-id Vlan
Fa3/1 connected access native -- 1
Fa3/7 disabled -- dot1q Po26 1
Fa3/13 connected access native -- 666
Router>
```

Related Commands

Command	Description
show interfaces	Displays the status and statistics for the interfaces in the chassis.

show interfaces switchport backup

To display Flexlink pairs, use the **showinterfacesswitchportbackup** command in user EXEC or privileged EXEC mode.

show interfaces [*interface interface-number*] **switchport backup**

Syntax Description

interface	(Optional) Interface type; possible valid values are **ethernet**, **fastethernet**, **gigabitethernet**, **tengigabitethernet**, **pos**, **atm**, and **ge-wan**.
interface-number	(Optional) Module and port number; see the "Usage Guidelines" section for valid values.

Command Default

This command has no default settings.

Command Modes

User EXEC Privileged EXEC

Command History

Release	Modification
12.2(18)SXF	Support for this command was introduced on the Supervisor Engine 720.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

Usage Guidelines

The *interface-number* designates the module and port number. Valid values depend on the chassis and module that are used. For example, if you have a 48-port 10/100BASE-T Ethernet module that is installed in a 13-slot chassis, valid values for the slot number are from 1 to 13 and valid values for the port number are from 1 to 48.

Examples

This example shows how to display all Flexlink pairs:

```
Router> show interfaces switchport backup
Switch Backup Interface Pairs:
Active Interface        Backup Interface        State
------------------------------------------------------------------------
FastEthernet3/1         FastEthernet4/1         Active Up/Backup Standby
FastEthernet5/1         FastEthernet5/2         Active Down/Backup Up
FastEthernet3/2         FastEthernet5/4         Active Standby/Backup Up
Po1                     Po2                     Active Down/Backup Down
Router>
```

This example shows how to display a specific Flexlink port:

```
Router> show interfaces fastethernet 4/1 switchport backup
Switch Backup Interface Pairs:
Active Interface        Backup Interface        State
------------------------------------------------------------------------
FastEthernet3/1       FastEthernet4/1           Active Up/Backup Standby
Router>
```

Related Commands

Command	Description
switchport backup	Configures an interface as a Flexlink backup interface.

show interfaces tokenring

To display information about the Token Ring interface and the state of source route bridging, use the **showinterfacestokenring** command in privileged EXEC mode.

Standard Syntax
show interfaces tokenring *number* [**accounting**]

Cisco 7200 and Cisco 7500 Series
show interfaces tokenring *slot*/*port* [**accounting**]

Cisco 7500 Series with Ports on VIPs
show interfaces tokenring [*slot*/*port-adapter*/*port*]

Syntax Description

number	Interface port line number.
accounting	(Optional) Displays the number of packets of each protocol type that have been sent through the interface.
slot	On the Cisco 7000 series routers, slot location of the interface processor. On the Cisco 7000, the value can be 0, 1, 2, 3, or 4. On the Cisco 7010, the value can be 0, 1, or 2. On the Cisco 7200 series routers, slot location of the port adapter; the value can be 1, 2, 3, 4, 5, or 6.
/ *port*	Port number on the interface. On the Cisco 7000 series routers this argument is required, and the values can be 0, 1, 2, or 3. (Optional) For the VIP, this argument is optional, and the port value can be 0, 1, 2, or 3 for 4-port Token Ring interfaces. On the Cisco 7200 series routers, the number depends on the type of port adapter installed.
/ *port-adapter*	(Optional) On the Cisco 7000 series and Cisco 7500 series routers, specifies the ports on a VIP. The value can be 0 or 1.

Command Modes

Privileged EXEC

Command History

Release	Modification
10.0	This command was introduced.
11.3(3)T	The information was modified to include the PA-4R-FDX full-duplex Token Ring port adapter.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines

If you do not provide values for the *slot* and *port*arguments, the command displays statistics for all the network interfaces. The optional **accounting** keyword displays the number of packets of each protocol type that have been sent through the interface.

Examples

The following is sample output from the **showinterfacestokenring** command:

```
Router# show interfaces tokenring
TokenRing 0 is up, line protocol is up
Hardware is 16/4 Token Ring, address is 5500.2000.dc27 (bia 0000.3000.072b)
    Internet address is 10.136.230.203, subnet mask is 255.255.255.0
    MTU 8136 bytes, BW 16000 Kbit, DLY 630 usec, rely 255/255, load 1/255
    Encapsulation SNAP, loopback not set, keepalive set (10 sec)
    ARP type: SNAP, ARP Timeout 4:00:00
    Ring speed: 16 Mbps
    Single ring node, Source Route Bridge capable
    Group Address: 0x00000000, Functional Address: 0x60840000
    Last input 0:00:01, output 0:00:01, output hang never
    Output queue 0/40, 0 drops; input queue 0/75, 0 drops
    Five minute input rate 0 bits/sec, 0 packets/sec
    Five minute output rate 0 bits/sec, 0 packets/sec
    16339 packets input, 1496515 bytes, 0 no buffer
          Received 9895 broadcasts, 0 runts, 0 giants
          0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     32648 packets output, 9738303 bytes, 0 underruns
0 output errors, 0 collisions, 2 interface resets, 0 restarts
     5 transitions
```

The table below describes the significant fields shown in the displays.

Table 50: show interfaces tokenring Field Descriptions

Field	Description
Token Ring is {up | down}	Interface is either currently active and inserted into ring (up) or inactive and not inserted (down). On the Cisco 7500 series routers, gives the interface processor type, slot number, and port number.
Token Ring is Reset	Hardware error has occurred.
Token Ring is Initializing	Hardware is up, in the process of inserting the ring.
Token Ring is Administratively Down	Hardware has been taken down by an administrator.
line protocol is {up | down | administratively down}	Indicates whether the software processes that handle the line protocol believe the interface is usable (that is, whether keepalives are successful).
Hardware	Hardware type. “Hardware is Token Ring” indicates that the board is a CSC-R board. “Hardware is 16/4 Token Ring” indicates that the board is a CSC-R16 board. Also shows the address of the interface.
Internet address	Lists the Internet address followed by subnet mask.
MTU	Maximum transmission unit of the interface.

Field	Description
BW	Bandwidth of the interface, in kilobits per second.
DLY	Delay of the interface, in microseconds.
rely	Reliability of the interface as a fraction of 255 (255/255 is 100 percent reliability), calculated as an exponential average over 5 minutes.
load	Load on the interface as a fraction of 255 (255/255 is completely saturated), calculated as an exponential average over 5 minutes.
Encapsulation	Encapsulation method assigned to interface.
loopback	Indicates whether loopback is set or not.
keepalive	Indicates whether keepalives are set or not.
ARP type	Type of Address Resolution Protocol assigned.
Ring speed	Speed of Token Ring--4 or 16 Mbps.
{Single ring | multiring node}	Indicates whether a node is enabled to collect and use source routing information (RIF) for routable Token Ring protocols.
Group Address	Interface's group address, if any. The group address is a multicast address; any number of interfaces on the ring may share the same group address. Each interface may have at most one group address.
Functional Address:	Bit-significant group address. Each "on" bit represents a function performed by the station.
Ethernet Transit OUI:	The Organizational Unique Identifier (OUI) code to be used in the encapsulation of Ethernet Type II frames across Token Ring backbone networks.
Last input	Number of hours, minutes, and seconds since the last packet was successfully received by an interface and processed locally on the router. Useful for knowing when a dead interface failed. This counter is updated only when packets are process-switched, not when packets are fast-switched.
Last output	Number of hours, minutes, and seconds since the last packet was successfully transmitted by an interface. This counter is updated only when packets are process-switched, not when packets are fast-switched.
output hang	Number of hours, minutes, and seconds (or never) since the interface was last reset because of a transmission that took too long. When the number of hours in any of the "last" fields exceeds 24 hours, the number of days and hours is printed. If that field overflows, asterisks are printed.

Field	Description
Last clearing	Time at which the counters that measure cumulative statistics (such as number of bytes transmitted and received) shown in this report were last reset to zero. Note that variables that might affect routing (for example, load and reliability) are not cleared when the counters are cleared. *** indicates the elapsed time is too large to be displayed. 0:00:00 indicates the counters were cleared more than 231 ms (and less than 232 ms) ago.
Output queue, drops Input queue, drops	Number of packets in output and input queues. Each number is followed by a slash, the maximum size of the queue, and the number of packets dropped because of a full queue.
Five minute input rate, Five minute output rate	Average number of bits and packets transmitted per second in the last 5 minutes. The 5-minute input and output rates should be used only as an approximation of traffic per second during a given 5-minute period. These rates are exponentially weighted averages with a time constant of 5 minutes. A period of four time constants must pass before the average will be within two percent of the instantaneous rate of a uniform stream of traffic over that period.
packets input	Total number of error-free packets received by the system.
bytes input	Total number of bytes, including data and MAC encapsulation, in the error-free packets received by the system.
no buffer	Number of received packets discarded because there was no buffer space in the main system. Compare with ignored count. Broadcast storms on Ethernet networks and bursts of noise on serial lines are often responsible for no input buffer events.
broadcasts	Total number of broadcast or multicast packets received by the interface.
runts	Number of packets that are discarded because they are smaller than the minimum packet size of the medium.
giants	Number of packets that are discarded because they exceed the of them medium maximum packet size.
CRC	Cyclic redundancy checksum generated by the originating LAN station or far-end device does not match the checksum calculated from the data received. On a LAN, this usually indicates noise or transmission problems on the LAN interface or the LAN bus itself. A high number of CRCs is usually the result of a station transmitting bad data.
frame	Number of packets received incorrectly having a CRC error and a noninteger number of octets.
overrun	Number of times the serial receiver hardware was unable to hand received data to a hardware buffer because the input rate exceeded the receiver's ability to handle the data.

Field	Description
ignored	Number of received packets ignored by the interface because the interface hardware ran low on internal buffers. These buffers are different than the system buffers mentioned previously in the buffer description. Broadcast storms and bursts of noise can cause the ignored count to be increased.
packets output	Total number of messages transmitted by the system.
bytes output	Total number of bytes, including data and MAC encapsulation, transmitted by the system.
underruns	Number of times that the far-end transmitter has been running faster than the near-end router's receiver can handle. This may never be reported on some interfaces.
output errors	Sum of all errors that prevented the final transmission of datagrams out of the interface being examined. Note that this may not balance with the sum of the enumerated output errors, as some datagrams may have more than one error, and others may have errors that do not fall into any of the specifically tabulated categories.
collisions	Since a Token Ring cannot have collisions, this statistic is nonzero only if an unusual event occurred when frames were being queued or dequeued by the system software.
interface resets	Number of times an interface has been reset. The interface may be reset by the administrator or automatically when an internal error occurs.
restarts	Should always be zero for Token Ring interfaces.
transitions	Number of times the ring made a transition from up to down, or vice versa. A large number of transitions indicates a problem with the ring or the interface.

The following is sample output from the **showinterfacestokenring** command on a Cisco 7500 series routers:

```
Router# show interfaces tokenring 2/0
TokenRing2/0 is administratively down, line protocol is down
  Hardware is cxBus Token Ring, address is 0000.3040.8b4a (bia 0000.3040.8b4a)
  MTU 8136 bytes, BW 16000 Kbit, DLY 630 usec, rely 255/255, load 1/255
  Encapsulation SNAP, loopback not set, keepalive set (10 sec)
  ARP type: SNAP, ARP Timeout 4:00:00
  Ring speed: 0 Mbps
  Single ring node, Source Route Transparent Bridge capable
  Ethernet Transit OUI: 0x0000F8
  Last input never, output never, output hang never
  Last clearing of "show interface" counters never
  Output queue 0/40, 0 drops; input queue 0/75, 0 drops
  Five minute input rate 0 bits/sec, 0 packets/sec
  Five minute output rate 0 bits/sec, 0 packets/sec
     0 packets input, 0 bytes, 0 no buffer
     Received 0 broadcasts, 0 runts, 0 giants
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     0 packets output, 0 bytes, 0 underruns
```

```
     0 output errors, 0 collisions, 1 interface resets, 0 restarts
     1 transitions
```

The following example on the Cisco 7500 series routers includes the **accounting** option. When you use the accounting option, only the accounting statistics are displayed.

```
Router# show interfaces tokenring 2/0 accounting
TokenRing2/0
       Protocol    Pkts In   Chars In   Pkts Out  Chars Out
             IP       7344    4787842       1803    1535774
      Appletalk      33345    4797459      12781    1089695
        DEC MOP          0          0        127       9779
            ARP          7        420         39       2340
```

The table below describes thefields shown in the display.

Table 51: show interfaces tokenring Field Descriptions--Accounting

Field	Description
Protocol	Protocol that is operating on the interface.
Pkts In	Number of packets received for that protocol.
Chars In	Number of characters received for that protocol.
Pkts Out	Number of packets transmitted for that protocol.
Chars Out	Number of characters transmitted for that protocol.

show interfaces transceiver

To display information about the optical transceivers that have digital optical monitoring (DOM) enabled, use the **showinterfacestransceiver** command in privileged EXEC mode.

Catalyst 6500 Series Switches and Cisco 7600 Series Routers
show interfaces [*interface interface-number*] **transceiver** [**threshold violations** | **properties**] [**detail** | **module** *number*]

Cisco 7200 VXR
show interfaces [*interface interface-number*] **transceiver**

Cisco ASR 901 Routers
show interfaces [*interface interface-number*] **transceiver** [**threshold** {**table** | **violations**} | **detail** | **supported-list**]

Cisco ASR 1000 Routers
show interfaces transceiver

Syntax Description

interface	(Optional) Interface type; possible valid values are **gigabitethernet** and **tengigabitethernet**.
interface-number	Module and port number; see the "Usage Guidelines" section for valid values.
threshold violations	(Optional) Displays information about the interface transceiver threshold violations.
properties	(Optional) Displays information about the port speed and duplex autonegotiation status.
detail	(Optional) Displays detailed information about the interface transceiver.
module *number*	(Optional) Specifies the module number; see the "Usage Guidelines" section for valid values.
threshold {**table** | **violations**}	(Optional) Displays information about the transceiver threshold. • **table**—Displays the alarm and warning threshold table. • **violations**—Displays the alarm and warning threshold violations.
supported-list	(Optional) Displays a list of all supported DOM transceivers.

Command Default

This command has no default settings.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(17d)SXB2	Support for this command was introduced on the Supervisor Engine 720 and the Supervisor Engine 2.
12.2(18)SXE	This command was changed to support DOM for GBICs and XENPAKs.
12.4(15)T	This command was integrated into Cisco IOS Release 12.4(15)T for the Cisco 7200 VXR with the NPE-G2 network processing engine.
12.2(33)SXI	This command was changed to display the port speed and duplex autonegotiation status
15.2(2)SNI	This command was implemented on the Cisco ASR 901 Series Aggregation Services Routers.
Cisco IOS XE Gibraltar 16.10.1	This command was implemenred on the Cisco ASR 1000 Series Aggregation Services Routers.

Usage Guidelines

After a transceiver is inserted, the software waits approximately 10 seconds before reading the diagnostic monitoring information. If you enter the **showinterfacestransceiver** command before the software has read the diagnostic monitoring information, the following message is displayed:

```
Waiting for diagnostic monitoring information to settle down.
Please try again after a few seconds.
```

Wait a few seconds and re-enter the **showinterfacestransceiver** command.

The *interfaceinterface-number* arguments are supported on interfaces that have a transceiver that has diagnostic monitoring enabled and the transceiver is in a module that supports the reading of diagnostic monitoring information. The transceiver periodically polls operating conditions such as temperature and power levels. The show interfaces transceiver command allows the router to display these operating conditions while the transceiver is in service.

Examples

This example shows how to display transceiver information:

```
Router# show interfaces transceiver
If device is externally calibrated, only calibrated values are printed.
++ : high alarm, +  : high warning, -  : low warning, -- : low alarm.
NA or N/A: not applicable, Tx: transmit, Rx: receive.
mA: milliamperes, dBm: decibels (milliwatts).
                                          Optical   Optical
         Temperature  Voltage  Current   Tx Power  Rx Power
Port     (Celsius)    (Volts)  (mA)      (dBm)     (dBm)
-------  -----------  -------  --------  --------  --------
Gi1/1      40.6       5.09       0.4     -25.2      N/A
Gi2/1      35.5       5.05       0.1     -29.2      N/A
Gi2/2      49.5       3.30       0.0       7.1     -18.7
```

This example shows how to display detailed transceiver information:

```
Router# show interfaces transceiver detail
mA: milliamperes, dBm: decibels (milliwatts), NA or N/A: not applicable.
++ : high alarm, +  : high warning, -  : low warning, -- : low alarm.
A2D readouts (if they differ), are reported in parentheses.
The threshold values are calibrated.
```

```
                                 High Alarm  High Warn  Low Warn   Low Alarm
          Temperature            Threshold   Threshold  Threshold  Threshold
Port       (Celsius)             (Celsius)   (Celsius)  (Celsius)  (Celsius)
-------  ------------------     ----------  ---------  ---------  ---------
Gi1/1      48.1                  100.0       100.0         0.0        0.0
Gi1/2      34.9                  100.0       100.0         0.0        0.0
Gi2/1      43.5                   70.0        60.0         5.0        0.0
Gi2/2      39.1                   70.0        60.0         5.0        0.0
                                 High Alarm  High Warn  Low Warn   Low Alarm
          Voltage                Threshold   Threshold  Threshold  Threshold
Port      (Volts)                (Volts)     (Volts)    (Volts)    (Volts)
-------  ---------------        ----------  ---------  ---------  ---------
Gi1/1    3.30                     6.50        6.50        N/A        N/A
Gi1/2    3.30                     6.50        6.50        N/A        N/A
Gi2/1    5.03                     5.50        5.25       4.75       4.50
Gi2/2    5.02                     5.50        5.25       4.75       4.50
                                 High Alarm  High Warn  Low Warn   Low Alarm
          Current                Threshold   Threshold  Threshold  Threshold
Port      (milliamperes)         (mA)        (mA)       (mA)       (mA)
-------  ------------------     ----------  ---------  ---------  ---------
Gi1/1      0.0                   130.0       130.0        N/A        N/A
Gi1/2      1.7                   130.0       130.0        N/A        N/A
Gi2/1     50.6          +         60.0        40.0       10.0        5.0
Gi2/2     25.8                   60.0        40.0       10.0        5.0
          Optical                High Alarm  High Warn  Low Warn   Low Alarm
          Transmit Power         Threshold   Threshold  Threshold  Threshold
Port      (dBm)                  (dBm)       (dBm)      (dBm)      (dBm)
-------  ------------------     ----------  ---------  ---------  ---------
Gi1/1      8.1          ++        8.1         8.1        N/A        N/A
Gi1/2     -9.8                    8.1         8.1        N/A        N/A
Gi2/1    -16.7          --        3.4         3.2       -0.3       -0.5
Gi2/2      0.8                    3.4         3.2       -0.3       -0.5
          Optical                High Alarm  High Warn  Low Warn   Low Alarm
          Receive Power          Threshold   Threshold  Threshold  Threshold
Port      (dBm)                  (dBm)       (dBm)      (dBm)      (dBm)
-------  ------------------     ----------  ---------  ---------  ---------
Gi1/1      N/A                    8.1         8.1        N/A        N/A
Gi1/2    -30.9                    8.1         8.1        N/A        N/A
Gi2/1      N/A                    5.9        -6.7       -28.5      -28.5
Gi2/2      N/A                    5.9        -6.7       -28.5      -28.5
```

This example shows how to display the threshold violations for all the transceivers on a Cisco 7600 series router:

```
Router# show interfaces transceiver threshold violations
        Rx: Receive, Tx: Transmit.
        DDDD: days, HH: hours, MM: minutes, SS: seconds
                                Time since Last Known
                Time in slot    Threshold Violation     Type(s) of Last Known
        Port    (DDDD:HH:MM:SS)  (DDDD:HH:MM:SS)       Threshold Violation(s)
        ------- --------------- ----------------------  ----------------------
        Gi1/1    0000:00:03:41    Not applicable        Not applicable
        Gi2/1    0000:00:03:40    0000:00:00:30         Tx bias high warning
                                                         50.5 mA >  40.0 mA
                                  0000:00:00:30         Tx power low alarm
                                                        -17.0 dBm <  -0.5 dBm
        Gi2/2    0000:00:03:40    Not applicable        Not applicable
```

This example shows how to display the threshold violations for all the transceivers on a Catalyst 6500 series switch:

```
Router# show interfaces transceiver threshold violations
        Rx: Receive, Tx: Transmit.
```

```
        DDDD: days, HH: hours, MM: minutes, SS: seconds
                                Time since Last Known
                Time in slot    Threshold Violation     Type(s) of Last Known
        Port    (DDDD:HH:MM:SS)  (DDDD:HH:MM:SS)        Threshold Violation(s)
        ------- --------------- ----------------------  ----------------------
        Gi1/1    0000:00:03:41    Not applicable        Not applicable
        Gi2/1    0000:00:03:40    0000:00:00:30         Tx bias high warning
                                                         50.5 mA >  40.0 mA
                                  0000:00:00:30         Tx power low alarm
                                                        -17.0 dBm <  -0.5 dBm
        Gi2/2    0000:00:03:40    Not applicable        Not applicable
Router#
```

This example shows how to display the threshold violations for all transceivers on a specific module:

```
Router# show interfaces transceiver threshold violations module 2
        lo: low, hi: high, warn: warning
        DDDD: days, HH: hours, MM: minutes, SS: seconds
                                Time since Last Known
                Time in slot    Threshold Violation     Type(s) of Last Known
        Port    (DDDD:HH:MM:SS)  (DDDD:HH:MM:SS)        Threshold Violation
        ------- --------------  ----------------------  ----------------------
        Gi2/1    0000:00:03:40    0000:00:00:30         Tx bias high warning
                                                         50.5 mA >  40.0 mA
                                  0000:00:00:30         Tx power low alarm
                                                        -17.0 dBm <  -0.5 dBm
        Gi2/2    0000:00:03:40    Not applicable        Not applicable
```

This example shows how to display violations for the transceiver on a specific interface:

```
Router# show interfaces Gi2/1 transceiver threshold violations
        Rx: Receive, Tx: Transmit.
        DDDD: days, HH: hours, MM: minutes, SS: seconds
                                Time since Last Known
                Time in slot    Threshold Violation     Type(s) of Last Known
        Port    (DDDD:HH:MM:SS)  (DDDD:HH:MM:SS)        Threshold Violation(s)
        ------- --------------- ----------------------  ----------------------
        Gi2/1    0000:00:03:40    0000:00:00:30         Tx bias high warning
                                                         50.5 mA >  40.0 mA
                                  0000:00:00:30         Tx power low alarm
                                                        -17.0 dBm <  -0.5 dBm
```

This example shows how to display the port speed and duplex autonegotiation status:

```
Router# show interfaces transceiver properties module 1
Name : Fa1/1
Administrative Speed Negotiation: Enable
Administrative Duplex Negotiation: Enable
Name : Fa1/2
Administrative Speed Negotiation: Disable
Administrative Duplex Negotiation: Enable
Name : Fa1/2
Administrative Speed Negotiation: Disable
Administrative Duplex Negotiation: Disable
Router#
```

This example shows how to use the show transceiver command on ASR 1000

```
The Transceiver in slot 1 subslot 0 port 0 is enabled.
Module temperature = +33.238 C [Range: +0.000 to +70.000 C]
Transceiver Tx supply voltage = 3.2942 Volts [Range: 3.1350 to 3.4650 Volts]
Transceiver Tx power = -4.1 dBm
Transceiver Rx optical power = -6.2 dBm
```

```
Tx power Network Lane[00] = -2.3 dBm (0.5824 in units of mW) [Range:-7.6 to -0.5 dBm]
Tx power Network Lane[01] = -2.1 dBm (0.6178 in units of mW) [Range:-7.6 to -0.5 dBm]
Tx power Network Lane[02] = -2.0 dBm (0.6359 in units of mW) [Range:-7.6 to -0.5 dBm]
Tx power Network Lane[03] = -1.9 dBm (0.6531 in units of mW) [Range:-7.6 to -0.5 dBm]
Tx power Network Lane[04] = -2.4 dBm (0.5821 in units of mW) [Range:-7.6 to -0.5 dBm]
Tx power Network Lane[05] = -2.0 dBm (0.6319 in units of mW) [Range:-7.6 to -0.5 dBm]
Tx power Network Lane[06] = -2.0 dBm (0.6268 in units of mW) [Range:-7.6 to -0.5 dBm]
Tx power Network Lane[07] = -1.9 dBm (0.6511 in units of mW) [Range:-7.6 to -0.5 dBm]
Tx power Network Lane[08] = -2.2 dBm (0.6076 in units of mW) [Range:-7.6 to -0.5 dBm]
Tx power Network Lane[09] = -2.1 dBm (0.6153 in units of mW) [Range:-7.6 to -0.5 dBm]
Tx power Network Lane[10] = -40.0 dBm (0.0 in units of mW) [Range:-7.6 to -0.5 dBm]
Tx power Network Lane[11] = -40.0 dBm (0.0 in units of mW) [Range:-7.6 to -0.5 dBm]
Tx power Network Lane[12] = -40.0 dBm (0.0 in units of mW) [Range:-7.6 to -0.5 dBm]
Tx power Network Lane[13] = -40.0 dBm (0.0 in units of mW) [Range:-7.6 to -0.5 dBm]
Tx power Network Lane[14] = -40.0 dBm (0.0 in units of mW) [Range:-7.6 to -0.5 dBm]
Tx power Network Lane[15] = -40.0 dBm (0.0 in units of mW) [Range:-7.6 to -0.5 dBm]
Rx power Network Lane[00] = -4.3 dBm (0.3697 in units of mW) [Range:-9.5 to 2.4 dBm]
Rx power Network Lane[01] = -3.7 dBm (0.4309 in units of mW) [Range:-9.5 to 2.4 dBm]
Rx power Network Lane[02] = -5.3 dBm (0.2959 in units of mW) [Range:-9.5 to 2.4 dBm]
Rx power Network Lane[03] = -3.2 dBm (0.4826 in units of mW) [Range:-9.5 to 2.4 dBm]
Rx power Network Lane[04] = -6.6 dBm (0.2175 in units of mW) [Range:-9.5 to 2.4 dBm]
Rx power Network Lane[05] = -4.0 dBm (0.4012 in units of mW) [Range:-9.5 to 2.4 dBm]
Rx power Network Lane[06] = -3.9 dBm (0.4062 in units of mW) [Range:-9.5 to 2.4 dBm]
Rx power Network Lane[07] = -4.7 dBm (0.3423 in units of mW) [Range:-9.5 to 2.4 dBm]
Rx power Network Lane[08] = -3.5 dBm (0.4444 in units of mW) [Range:-9.5 to 2.4 dBm]
Rx power Network Lane[09] = -3.1 dBm (0.4895 in units of mW) [Range:-9.5 to 2.4 dBm]
Rx power Network Lane[10] = -40.0 dBm (0.0 in units of mW) [Range:-9.5 to 2.4 dBm]
Rx power Network Lane[11] = -40.0 dBm (0.0 in units of mW) [Range:-9.5 to 2.4 dBm]
Rx power Network Lane[12] = -40.0 dBm (0.0 in units of mW) [Range:-9.5 to 2.4 dBm]
Rx power Network Lane[13] = -40.0 dBm (0.0 in units of mW) [Range:-9.5 to 2.4 dBm]
Rx power Network Lane[14] = -40.0 dBm (0.0 in units of mW) [Range:-9.5 to 2.4 dBm]
Rx power Network Lane[15] = -40.0 dBm (0.0 in units of mW) [Range:-9.5 to 2.4 dBm]
Bias Current Network Lane[00] = 6.216 (in units of mA) [Range:0.0 to 43.520 mA]
Bias Current Network Lane[01] = 5.756 (in units of mA) [Range:0.0 to 43.520 mA]
Bias Current Network Lane[02] = 6.304 (in units of mA) [Range:0.0 to 43.520 mA]
Bias Current Network Lane[03] = 6.224 (in units of mA) [Range:0.0 to 43.520 mA]
Bias Current Network Lane[04] = 6.194 (in units of mA) [Range:0.0 to 43.520 mA]
Bias Current Network Lane[05] = 6.84 (in units of mA) [Range:0.0 to 43.520 mA]
Bias Current Network Lane[06] = 6.196 (in units of mA) [Range:0.0 to 43.520 mA]
Bias Current Network Lane[07] = 6.222 (in units of mA) [Range:0.0 to 43.520 mA]
Bias Current Network Lane[08] = 6.208 (in units of mA) [Range:0.0 to 43.520 mA]
Bias Current Network Lane[09] = 5.556 (in units of mA) [Range:0.0 to 43.520 mA]
Bias Current Network Lane[10] = 0.0 (in units of mA) [Range:0.0 to 43.520 mA]
Bias Current Network Lane[11] = 0.0 (in units of mA) [Range:0.0 to 43.520 mA]
Bias Current Network Lane[12] = 0.0 (in units of mA) [Range:0.0 to 43.520 mA]
Bias Current Network Lane[13] = 0.0 (in units of mA) [Range:0.0 to 43.520 mA]
Bias Current Network Lane[14] = 0.0 (in units of mA) [Range:0.0 to 43.520 mA]
Bias Current Network Lane[15] = 0.0 (in units of mA) [Range:0.0 to 43.520 mA]
IDPROM for transceiver HundredGigE1/0/0:
Description = CPAK optics (type 131)
Transceiver Type: = CPAK 100GE SR10 (313)
Product Identifier (PID) = CPAK-100G-SR10
Vendor Revision = 01
Serial Number (SN) = FBN181720831
Vendor Name = CISCO
Vendor OUI (IEEE company ID) = 00.00.0C (12)
CLEI code = WOTRC5PBAA
Cisco part number = 800-41495-
Device State = Enabled.
Date code (yyyy/mm/dd) = 2014/04/24
Connector type = MPO.
Encoding = NRZ, Non-PSK.
Bit Rate = 111.8 Gbps
Maximum Bit Rate Network Lane = 11.2 Gbits/s
```

```
Maximum Bit Rate Host Lane = 11.2 Gbits/s
The Transceiver in slot 1 subslot 1 port 0 is enabled.
Module temperature = +43.578 C [Range: 0 to 70 C]
Transceiver Tx supply voltage = 3287.5 mVolts [Range: 3135.0 to 3465.0 mVolts]
Transceiver Tx bias current = 7710 uAmps [Range: 5000 to 10800 uAmps]
Transceiver Tx power = -2.0 dBm [Range: -7.3 to -1.3 dBm]
Transceiver Rx optical power = -2.0 dBm [Range:-9.9 to -1.0 dBm]
IDPROM for transceiver TenGigabitEthernet1/1/0:
Description = SFP+ optics (type 130)
Transceiver Type: = SFP+ 10GBASE-SR (273)
Product Identifier (PID) = SFP-10G-SR
Vendor Revision = A
Serial Number (SN) = FNS173814XB
Vendor Name = CISCO-FINISAR
Vendor OUI (IEEE company ID) = 00.90.65 (36965)
CLEI code = COUIA8NCAA
Cisco part number = 10-2415-03
Device State = Enabled.
Date code (yy/mm/dd) = 13/09/17
Connector type = LC.
Encoding = 64B66B
Nominal bitrate = 10GE (10300 Mbits/s)
Minimum bit rate as % of nominal bit rate = not specified
Maximum bit rate as % of nominal bit rate = not specified
```

Cisco ASR 901 Routers

show interfaces [*interface interface-number*] **transceiver** [**threshold** {**table** | **violations**} | **detail** | **supported-list**]

Cisco 7200 VXR

This example shows static information and current status information for the transceiver. The static information is a description of the transceiver and its physical capabilities, which is provided by the manufacturer in EEPROM. The status information shows current operating conditions, as well as alarm and warning threshold ranges.

Alarms indicate conditions that might be associated with a non-operational link and are cause for immediate action. Warnings indicate conditions outside the normally guaranteed ranges but are not necessarily causes of immediate link failures. Certain warnings can also be defined by the manufacturer as end-of-life indicators, such as higher than expected bias currents in a constant power control loop.

In this example, the fiber optic cable is disconnected and the appropriate alarms and warnings are displayed.

```
Router# show interfaces g0/3 transceiver
Static information
  ID: SFP transceiver
  Extended ID: 4
  Connector: LC
  SONET compliance: unspecified
  Gigabit Ethernet compliance: 1000BASE-SX
  Fibre Channel link length: unspecified
  Fibre Channel transmitter technology: unspecified
  Fibre Channel transmission media: unspecified
  Fibre Channel speed: unspecified
  Encoding: 8B10B
  Bit Rate: 1300 Mbps
  50 micron-multimode fiber supported length: 550 m
```

```
  62.5 micron-multimode fiber supported length: 270 m
  Upper bit rate limit: unspecified
  Lower bit rate limit: unspecified
  Date code (yyyy/mm/dd): 2005/03/21
  Vendor PN: FTRJ8519P1BNL-C6
  Vendor revision number: A
  Vendor serial number: FNS0913D1HL
Transceiver status information
  Diagnostics calibration is external
  Temperature 36 (+/-3 Celsius)
  Voltage in transceiver 3320000 uV (+/- 10 mV)
  TX bias 260 uA (+/- 100uA)
  TX power 700 nW / -31 dBm (+/- 3dBm)
  RX power (No signal detected: fiber might be bad or disconnected).
UDI(PID + VID + SN):FNS0913D1HL
Alarms
  TX power low
  TX bias low
  RX power low
Warnings
  TX power low
  TX bias low
  RX power low
Alarm Thresholds:
                      high                          low
Temperature            109 C                        -29 C
Voltage             3900000 uV                   2700000 uV
TX bias               15000 uA                      1000 uA
TX power             629700 nW /-2 dBm             49800 nW / -13 dBm
RX power              1258900 nW / 0 dBm               10000 nW / -20 dBm
Warning Thresholds:
                      high                          low
Temperature            103 C                        -13 C
Voltage             3700000 uV                   2900000 uV
TX bias               12000 uA                      2000 uA
TX power             629700 nW / -2 dBm            78800 nW / -11 dBm
RX power               794000 nW / -1 dBm              15800 nW / -18 dBm
```

The table below describes the significant fields shown in the display.

Table 52: show interfaces transceiver Field Descriptions

Field	Description
Diagnostics calibration	Indicates whether diagnostic information (temperature, voltage, bias, and power) is calibrated internally or externally. Internal calibration means that measurements are calibrated over vendor-specified operating temperature and voltage. External calibration means that measurements are raw analog/digital values and are converted to common units of measure, such as volts and amperes, using calibration constants stored in EEPROM.
Temperature	Internally-measured transceiver temperature.
Voltage in transceiver	Internally-measured supply voltage.
TX bias	Measured transmitter laser bias current.
TX power	Measured coupled transmit output power.
RX power	Measured received optical power.

Field	Description
UDI	Unique device identifier.

show interfaces transceiver details

The show interfaces transceiver details command displays combined results of **show hw-mod subslot transceiver idprom brief** and **show hw-mod sub transceiver idprom dump** commands. The output also includes error optics information from the line card console and information is displayed for all the transceivers in the router. The output also includes alarm status if CPAK transceivers are installed in the router..

show interfaces transceiverdetails

Syntax Description

This command has no arguments or keywords.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Examples

The following is the sample output from the **show interfaces transceiver details** command:.

```
Router# show interfaces transceiver details
IDPROM for transceiver HundredGigE1/0/0:
Description = CPAK optics (type 131)
Transceiver Type: = CPAK 100GE SR10 (313)
Product Identifier (PID) = CPAK-100G-SR10
Vendor Revision = 01
Serial Number (SN) = FBN181720831
Vendor Name = CISCO
Vendor OUI (IEEE company ID) = 00.00.0C (12)
CLEI code = WOTRC5PBAA
Cisco part number = 800-41495-
Device State = Enabled.
Date code (yyyy/mm/dd) = 2014/04/24
Connector type = MPO.
Encoding = NRZ, Non-PSK.
Bit Rate = 111.8 Gbps
Maximum Bit Rate Network Lane = 11.2 Gbits/s
Maximum Bit Rate Host Lane = 11.2 Gbits/s
Phased Initialization
Phase Reached: 5
Phase Exit Code: Success 0
Phase Read Offset: 0x80
Socket Verification
Compatibility: Compatibility passed
Security: Security passed
Idprom Contents (hex)
(CPAK NVR1 Table - addr 0x8000-0x807F)
000: 01 21 09 03 00 00 00 00 1E AA
010: 4A 38 38 00 0A 00 0A 01 83 40
020: 86 60 00 00 00 04 40 50 26 17
030: 14 46 00 43 49 53 43 4F 20 20
040: 20 20 20 20 20 20 20 20 20 00
050: 00 0C 38 30 30 2D 34 31 34 39
060: 35 2D 30 31 20 20 20 20 46 42
070: 4E 31 38 31 37 32 30 38 33 31
080: 20 20 20 20 32 30 31 34 30 34
090: 32 34 00 00 57 4F 54 52 43 35
```

```
100: 50 42 41 41 6E 5A 00 05 02 03
110: 0C 03 0F 20 01 01 08 00 FE 01
120: 00 00 00 02 03 00 00 FC
Threshold Data (hex)
CPAK NVR2 Table - address 0x8080-0x80FF
000: 4B 00 46 00 00 00 FB 00 8A 00
010: 87 5A 7A 76 77 E2 00 00 00 00
020: 00 00 00 00 00 00 00 00 00 00
030: 00 00 00 00 00 00 00 00 00 00
040: 13 88 11 94 05 DC 03 E8 45 76
050: 22 D0 06 C9 03 66 5A 00 55 00
060: 00 00 FB 00 88 71 43 E2 04 62
070: 02 32 00 00 00 00 00 00 00 00
080: 00 00 00 00 00 00 00 00 00 00
090: 00 00 00 00 00 00 00 00 00 00
100: 00 00 00 00 00 00 00 00 00 00
110: 00 00 00 00 00 00 00 00 00 00
120: 00 00 00 00 00 00 00 93
Vendor Idprom Contents (hex)
Vendor Cisco NVR1 Table - address 0x8400-0x847F
000: 02 00 00 00 00 00 00 00 00 00
010: 00 00 00 00 00 00 43 49 53 43
020: 4F 20 20 20 20 20 20 20 20 20
030: 20 20 43 50 41 4B 2D 31 30 30
040: 47 2D 53 52 31 30 20 20 56 45
050: 53 31 07 46 42 4E 31 38 31 37
060: 32 30 38 33 38 30 30 2D 34 31
070: 34 39 35 2D 30 31 30 31 20 20
080: 00 00 00 00 00 00 00 00 00 00
090: 00 32 38 2D 31 31 30 32 30 2D
100: 30 34 00 00 00 00 00 00 00 00
110: 00 00 00 00 00 00 00 00 00 00
120: 00 00 00 00 00 00 00 1B
Vendor Idprom Contents 2 (hex)
Vendor CISCO NVR2 Table - address 0x8480-0x84FF
000: 00 00 00 00 00 00 00 00 00 00
010: 00 00 00 00 00 00 00 00 00 00
020: 00 00 00 00 00 00 00 00 00 00
030: 00 00 41 46 45 30 34 30 46 52
040: 20 20 20 20 20 20 20 20 41 46
050: 45 30 34 42 47 55 20 20 20 20
060: 20 20 20 20 00 00 00 00 00 00
070: 00 00 00 00 00 00 00 00 00 00
080: 53 52 31 34 34 30 31 30 37 39
090: 2D 30 36 20 20 20 00 00 00 00
100: 00 00 00 00 00 00 00 00 00 00
110: 00 00 00 00 00 00 00 00 00 00
120: 00 00 00 00 00 00 00 38
Module State Register: 0x0020
Module General Control Register: 0x0000
Global Alarm Status: 0x0000
Network Lanes Alarm and Warning Status: 0x0000
Network Lanes Fault Status Summary: 0x0000
Host Lanes Fault Status Summary: 0x0000
Module Fault and Warning, General Status Summary: 0x0002
Module Fault and Warning, Fault Status Summary: 0x0000
Fault and Warning status, Alarms and Warning 1: 0x0000
Multimode fiber supported length = 100 m
Enhanced options implemented:
Host Lane PRBS Supported
Enhanced options 2 implemented:
none
Diagnostic monitoring implemented:
Transmitted power measurement type
```

```
Received power measurement type
Diagnostic monitoring capability 1:
Transceiver temperature monitor
Transceiver power supply voltage monitor
Diagnostic monitoring capability 2:
Network Lane laser temperature monitor
Network Lane laser bias current monitor
Network Lane laser output power monitor
Network Lane received power monitor
```

show interfaces transceiver slot

The show interfaces transceiver slot command displays combined results of **show hw-module subslot transceiver status** and show hw-module subslot transceiver idprom brief commands along with the threshold range details. The output is displayed for the transceivers in a specific slot on the router.

show interfaces transceiver slot[*slot-number*]

Syntax Description

slot-number	Chassis slot-number.

Command Modes

Privileged EXEC(#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Examples

The following is sample output from the **show interfaces transceiver slot** comman::

```
Router# show interfaces transceiver slot 2The Transceiver in slot 2 subslot 0 port 0 is
enabled.
Module temperature = +31.714 C [Range: -5 C to 85 C (extended)]
Transceiver Tx supply voltage = 3331.8 mVolts [Range: 3140.0 to 3470.0 mVolts]
Transceiver Tx bias current = 3112 uAmps [Range: 2400 to 11900 uAmps]
Transceiver Tx power = -5.8 dBm [Range: -9.5 to -3.0 dBm]
Transceiver Rx optical power = -7.4 dBm [Range: -17.0 to 0.0 dBm]
IDPROM for transceiver GigabitEthernet2/0/0:
Description = SFP or SFP+ optics (type 3)
Transceiver Type: = GE SX (19)
Product Identifier (PID) = GLC-SX-MMD
Vendor Revision = 001
Serial Number (SN) = AGJ1825R57R
Vendor Name = CISCO
Vendor OUI (IEEE company ID) = 00.17.6A (5994)
CLEI code = WOTRB9VBAA
Cisco part number = 10-2626-01
Device State = Enabled.
Date code (yy/mm/dd) = 14/06/17
Connector type = LC.
Encoding = 8B10B (1)
Nominal bitrate = GE (1300 Mbits/s)
Minimum bit rate as % of nominal bit rate = not specified
Maximum bit rate as % of nominal bit rate = not specified
```

show interfaces transceiver slot details

The show interfaces transceiver slot details command displays combined results of **show hw-mod subslot transceiver idprom brief** and **show hw-mod sub transceiver idprom dump commands**. The output also includes error optics information from the line card console and information is displayed for all the transceivers in a specific slot. The output also includes alarm details for the CPAK transceivers installed on the router.

show interfaces transceiver slot[*slot-number*]**details**

Syntax Description

slot-number	Chassis slot-number.

Command Modes

Privileged EXEC(#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Examples

The following is sample output from the **show interfaces transceiver slot details** comman::

```
Router# show interfaces transceiver slot 2 details
IDPROM for transceiver GigabitEthernet2/0/0:
Description = SFP or SFP+ optics (type 3)
Transceiver Type: = GE SX (19)
Product Identifier (PID) = GLC-SX-MMD
Vendor Revision = 001
Serial Number (SN) = AGJ1825R57R
Vendor Name = CISCO
Vendor OUI (IEEE company ID) = 00.17.6A (5994)
CLEI code = WOTRB9VBAA
Cisco part number = 10-2626-01
Device State = Enabled.
Date code (yy/mm/dd) = 14/06/17
Connector type = LC.
Encoding = 8B10B (1)
Nominal bitrate = GE (1300 Mbits/s)
Minimum bit rate as % of nominal bit rate = not specified
Maximum bit rate as % of nominal bit rate = not specified
Phased Initialization
Phase Reached: 5
Phase Exit Code: Success 0
Phase Read Offset: 0x100
Socket Verification
Compatibility: Compatibility passed
Security: Security passed
SFP IDPROM Page 0xA0:
000: 03 04 07 00 00 00 01 00 00 00
010: 00 01 0D 00 00 00 37 1B 00 00
020: 43 49 53 43 4F 20 20 20 20 20
030: 20 20 20 20 20 20 00 00 17 6A
040: 53 46 42 52 2D 35 37 31 36 50
050: 5A 20 20 20 20 20 30 30 31 20
060: 03 52 00 3E 00 1A 00 00 41 47
070: 4A 31 38 32 35 52 35 37 52 20
080: 20 20 20 20 31 34 30 36 31 37
090: 20 20 68 F0 03 3A 00 00 06 BC
100: 13 7F 4C 09 FD 98 52 53 B6 88
```

```
110: B7 DF 55 30 D9 00 00 00 00 00
120: 00 00 00 00 5A 53 74 66 00 00
130: 00 00 00 00 00 00 00 00 00 00
140: 00 00 00 00 00 00 00 00 00 00
150: 00 00 00 00 00 00 00 00 00 00
160: 00 00 00 00 00 00 00 00 00 00
170: 00 00 00 00 00 00 00 00 00 00
180: 00 00 00 00 00 00 00 00 00 00
190: 00 00 00 00 00 00 00 00 00 00
200: 00 00 00 00 00 00 00 00 00 00
210: 00 00 00 00 00 00 00 00 00 00
220: 00 00 00 00
SFP IDPROM Page 0xA2:
000: 5A 00 F6 00 55 00 FB 00 8D CC
010: 74 04 87 8C 7A A8 18 E7 03 E8
020: 17 3E 04 B0 27 10 01 BF 13 94
030: 04 62 4D F0 00 4F 27 10 00 C7
040: 00 00 00 00 00 00 00 00 00 00
050: 00 00 00 00 00 00 00 00 00 00
060: 00 00 00 00 00 00 00 00 3F 80
070: 00 00 00 00 00 00 01 00 00 00
080: 01 00 00 00 01 00 00 00 01 00
090: 00 00 68 00 00 52 1A 1B 82 C1
100: 00 01 00 01 00 01 00 00 00 0F
110: 82 00 05 40 00 00 05 40 00 00
120: 00 00 00 00 00 00 00 01 57 4F
130: 54 52 42 39 56 42 41 41 31 30
140: 2D 32 36 32 36 2D 30 31 56 30
150: 31 20 88 FB 55 00 00 00 00 7C
160: 00 00 00 00 00 00 00 00 00 00
170: 00 00 00 00 00 00 00 00 00 00
180: 00 00 00 00 00 00 00 00 00 00
190: AA AA 47 4C 43 2D 53 58 2D 4D
200: 4D 44 20 20 20 20 20 20 20 20
210: 20 20 00 00 00 00 00 00 00 00
220: 00 00 00 F9 00 00 00 00 00 00
230: 00 00 00 00 00 00 00 00 00 00
240: 00 00 00 00 00 00 00 00 FF FF
250: FF FF 00 00 00 00
Link reach for 9u fiber (km) = SX(550/270m) (0)
1xFC-MM(500/300m) (0)
2xFC-MM(300/150m) (0)
ESCON-MM(2km) (0)
Link reach for 9u fiber (m) = SX(550/270m) (0)
1xFC-MM(500/300m) (0)
2xFC-MM(300/150m) (0)
ESCON-MM(2km) (0)
Link reach for 50u fiber (m) = SX(550/270m) (55)
LX(5km/550m) (55)
LX(10km/550m) (55)
Nominal laser wavelength = 850 nm.
DWDM wavelength fraction = 850.0 nm.
Supported options = Tx disable
Tx fault signal
Loss of signal (standard implementation)
Supported enhanced options = Alarms for monitored parameters
Software Tx disable
Software Tx fault monitoring
Software Rx LOS monitoring
Diagnostic monitoring = Digital diagnostics supported
Diagnostics are internally calibrated
Rx power measured is "Average power"
```

show interfaces transceiver subslot

The **show interfaces transceiver subslot** command displays results of **show hw-module subslot transceiver status** and **show hw-module subslot transceiver idprom brief** command along with threshold range details. The output is displayed for the transceivers in a specific subslot.

show interfaces transceiver subslot[*subslot-number*]

Syntax Description

subslot-number	Secondary slot number on a SIP where a SPA is installed..

Command Modes

Privileged EXEC(#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Examples

The following is sample output from the **show interfaces transceiver subslot** command:

```
Router# show interfaces transceiver subslot 2/0
The Transceiver in slot 2 subslot 0 port 0 is enabled.
Module temperature = +31.714 C [Range: -5 C to 85 C (extended)]
Transceiver Tx supply voltage = 3331.8 mVolts [Range: 3140.0 to 3470.0 mVolts]
Transceiver Tx bias current = 3112 uAmps [Range: 2400 to 11900 uAmps]
Transceiver Tx power = -5.8 dBm [Range: -9.5 to -3.0 dBm]
Transceiver Rx optical power = -7.4 dBm [Range: -17.0 to 0.0 dBm]
IDPROM for transceiver GigabitEthernet2/0/0:
Description = SFP or SFP+ optics (type 3)
Transceiver Type: = GE SX (19)
Product Identifier (PID) = GLC-SX-MMD
Vendor Revision = 001
Serial Number (SN) = AGJ1825R57R
Vendor Name = CISCO
Vendor OUI (IEEE company ID) = 00.17.6A (5994)
CLEI code = WOTRB9VBAA
Cisco part number = 10-2626-01
Device State = Enabled.
Date code (yy/mm/dd) = 14/06/17
Connector type = LC.
Encoding = 8B10B (1)
Nominal bitrate = GE (1300 Mbits/s)
Minimum bit rate as % of nominal bit rate = not specified
Maximum bit rate as % of nominal bit rate = not specified
```

show interfaces transceiver subslot details

The **show interfaces transceiver subslot details** command displays combined results of **show hw-mod subslot idprom brief** and **show hw-mod subslot idprom dump** commands. The output also includes error optics information from the line card console and information for all the transceivers in a specific subslot. The output also includes alarm details for the CPAK transceivers installed on the router.

show interfaces transceiver subslot[*subslot-number*]**details**

Syntax Description

subslot-number	Secondary slot number on a SIP where a SPA is installed..

Command Modes

Privileged EXEC(#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Examples

The following is sample output from the **show interfaces transceiver subslot details** command:

```
Router# show interfaces transceiver subslot 2/0 details
IDPROM for transceiver GigabitEthernet2/0/0:
Description = SFP or SFP+ optics (type 3)
Transceiver Type: = GE SX (19)
Product Identifier (PID) = GLC-SX-MMD
Vendor Revision = 001
Serial Number (SN) = AGJ1825R57R
Vendor Name = CISCO
Vendor OUI (IEEE company ID) = 00.17.6A (5994)
CLEI code = WOTRB9VBAA
Cisco part number = 10-2626-01
Device State = Enabled.
Date code (yy/mm/dd) = 14/06/17
Connector type = LC.
Encoding = 8B10B (1)
Nominal bitrate = GE (1300 Mbits/s)
Minimum bit rate as % of nominal bit rate = not specified
Maximum bit rate as % of nominal bit rate = not specified
Phased Initialization
Phase Reached: 5
Phase Exit Code: Success 0
Phase Read Offset: 0x100
Socket Verification
Compatibility: Compatibility passed
Security: Security passed
SFP IDPROM Page 0xA0:
000: 03 04 07 00 00 00 01 00 00 00
010: 00 01 0D 00 00 00 37 1B 00 00
020: 43 49 53 43 4F 20 20 20 20 20
030: 20 20 20 20 20 20 00 00 17 6A
040: 53 46 42 52 2D 35 37 31 36 50
050: 5A 20 20 20 20 20 30 30 31 20
060: 03 52 00 3E 00 1A 00 00 41 47
070: 4A 31 38 32 35 52 35 37 52 20
080: 20 20 20 20 31 34 30 36 31 37
090: 20 20 68 F0 03 3A 00 00 06 BC
100: 13 7F 4C 09 FD 98 52 53 B6 88
```

```
110: B7 DF 55 30 D9 00 00 00 00 00
120: 00 00 00 00 5A 53 74 66 00 00
130: 00 00 00 00 00 00 00 00 00 00
140: 00 00 00 00 00 00 00 00 00 00
150: 00 00 00 00 00 00 00 00 00 00
160: 00 00 00 00 00 00 00 00 00 00
170: 00 00 00 00 00 00 00 00 00 00
180: 00 00 00 00 00 00 00 00 00 00
190: 00 00 00 00 00 00 00 00 00 00
200: 00 00 00 00 00 00 00 00 00 00
210: 00 00 00 00 00 00 00 00 00 00
220: 00 00 00 00
SFP IDPROM Page 0xA2:
000: 5A 00 F6 00 55 00 FB 00 8D CC
010: 74 04 87 8C 7A A8 18 E7 03 E8
020: 17 3E 04 B0 27 10 01 BF 13 94
030: 04 62 4D F0 00 4F 27 10 00 C7
040: 00 00 00 00 00 00 00 00 00 00
050: 00 00 00 00 00 00 00 00 00 00
060: 00 00 00 00 00 00 00 00 3F 80
070: 00 00 00 00 00 00 01 00 00 00
080: 01 00 00 00 01 00 00 00 01 00
090: 00 00 68 00 00 52 1A 1B 82 C1
100: 00 01 00 01 00 01 00 00 00 0F
110: 82 00 05 40 00 00 05 40 00 00
120: 00 00 00 00 00 00 00 01 57 4F
130: 54 52 42 39 56 42 41 41 31 30
140: 2D 32 36 32 36 2D 30 31 56 30
150: 31 20 88 FB 55 00 00 00 00 7C
160: 00 00 00 00 00 00 00 00 00 00
170: 00 00 00 00 00 00 00 00 00 00
180: 00 00 00 00 00 00 00 00 00 00
190: AA AA 47 4C 43 2D 53 58 2D 4D
200: 4D 44 20 20 20 20 20 20 20 20
210: 20 20 00 00 00 00 00 00 00 00
220: 00 00 00 F9 00 00 00 00 00 00
230: 00 00 00 00 00 00 00 00 00 00
240: 00 00 00 00 00 00 00 00 FF FF
250: FF FF 00 00 00 00
Link reach for 9u fiber (km) = SX(550/270m) (0)
1xFC-MM(500/300m) (0)
2xFC-MM(300/150m) (0)
ESCON-MM(2km) (0)
Link reach for 9u fiber (m) = SX(550/270m) (0)
1xFC-MM(500/300m) (0)
2xFC-MM(300/150m) (0)
ESCON-MM(2km) (0)
Link reach for 50u fiber (m) = SX(550/270m) (55)
LX(5km/550m) (55)
LX(10km/550m) (55)
Nominal laser wavelength = 850 nm.
DWDM wavelength fraction = 850.0 nm.
Supported options = Tx disable
Tx fault signal
Loss of signal (standard implementation)
Supported enhanced options = Alarms for monitored parameters
Software Tx disable
Software Tx fault monitoring
Software Rx LOS monitoring
Diagnostic monitoring = Digital diagnostics supported
Diagnostics are internally calibrated
Rx power measured is "Average power"
```

show interfaces <interface> transceiver

The **show interfaces <interface> transceiver** command displays combined results of **show hw-module subslot transceiver status** and **show hw-module subslot transceiver idprom brief** commands along with threshold range details. The output is displayed for a specific interface on the router.

show interfaces[*interface-typeslot/subslot/port*] **transceiver**

Syntax Description

interface-type	Interface type; possible valid values are pos, atm, ethernet, fastethernet, gigabitethernet, tengigabitethernet, fortygigabitethernet, hundredGigE.
slot	Number of the router slot.
subslot	Secondary slot number on a SIP where a SPA is installed.
port	Port number

Command Modes

Privileged EXEC(#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Examples

The following is sample output from the **show interfaces <interface> transceiver** command:

```
Router# show interfaces hundredGigE 1/0/0 transceiver
The Transceiver in slot 1 subslot 0 port 0 is enabled.
Module temperature = +33.238 C [Range: +0.000 to +70.000 C]
Transceiver Tx supply voltage = 3.2967 Volts [Range: 3.1350 to 3.4650 Volts]
Transceiver Tx power = -4.1 dBm
Transceiver Rx optical power = -6.1 dBm
Tx power Network Lane[00] = -2.3 dBm (0.5823 in units of mW) [Range:-7.6 to -0.5 dBm]
Tx power Network Lane[01] = -2.1 dBm (0.6182 in units of mW) [Range:-7.6 to -0.5 dBm]
Tx power Network Lane[02] = -2.0 dBm (0.6332 in units of mW) [Range:-7.6 to -0.5 dBm]
Tx power Network Lane[03] = -1.9 dBm (0.6522 in units of mW) [Range:-7.6 to -0.5 dBm]
Tx power Network Lane[04] = -2.3 dBm (0.5827 in units of mW) [Range:-7.6 to -0.5 dBm]
Tx power Network Lane[05] = -2.0 dBm (0.6324 in units of mW) [Range:-7.6 to -0.5 dBm]
Tx power Network Lane[06] = -2.0 dBm (0.6251 in units of mW) [Range:-7.6 to -0.5 dBm]
Tx power Network Lane[07] = -1.9 dBm (0.6519 in units of mW) [Range:-7.6 to -0.5 dBm]
Tx power Network Lane[08] = -2.2 dBm (0.6070 in units of mW) [Range:-7.6 to -0.5 dBm]
Tx power Network Lane[09] = -2.1 dBm (0.6148 in units of mW) [Range:-7.6 to -0.5 dBm]
Tx power Network Lane[10] = -40.0 dBm (0.0 in units of mW) [Range:-7.6 to -0.5 dBm]
Tx power Network Lane[11] = -40.0 dBm (0.0 in units of mW) [Range:-7.6 to -0.5 dBm]
Tx power Network Lane[12] = -40.0 dBm (0.0 in units of mW) [Range:-7.6 to -0.5 dBm]
Tx power Network Lane[13] = -40.0 dBm (0.0 in units of mW) [Range:-7.6 to -0.5 dBm]
Tx power Network Lane[14] = -40.0 dBm (0.0 in units of mW) [Range:-7.6 to -0.5 dBm]
Tx power Network Lane[15] = -40.0 dBm (0.0 in units of mW) [Range:-7.6 to -0.5 dBm]
Rx power Network Lane[00] = -4.3 dBm (0.3675 in units of mW) [Range:-9.5 to 2.4 dBm]
Rx power Network Lane[01] = -3.6 dBm (0.4325 in units of mW) [Range:-9.5 to 2.4 dBm]
Rx power Network Lane[02] = -5.3 dBm (0.2963 in units of mW) [Range:-9.5 to 2.4 dBm]
Rx power Network Lane[03] = -3.1 dBm (0.4851 in units of mW) [Range:-9.5 to 2.4 dBm]
Rx power Network Lane[04] = -6.6 dBm (0.2183 in units of mW) [Range:-9.5 to 2.4 dBm]
Rx power Network Lane[05] = -4.0 dBm (0.4015 in units of mW) [Range:-9.5 to 2.4 dBm]
Rx power Network Lane[06] = -3.9 dBm (0.4109 in units of mW) [Range:-9.5 to 2.4 dBm]
Rx power Network Lane[07] = -4.6 dBm (0.3431 in units of mW) [Range:-9.5 to 2.4 dBm]
```

```
Rx power Network Lane[08] = -3.5 dBm (0.4448 in units of mW) [Range:-9.5 to 2.4 dBm]
Rx power Network Lane[09] = -3.1 dBm (0.4895 in units of mW) [Range:-9.5 to 2.4 dBm]
Rx power Network Lane[10] = -40.0 dBm (0.0 in units of mW) [Range:-9.5 to 2.4 dBm]
Rx power Network Lane[11] = -40.0 dBm (0.0 in units of mW) [Range:-9.5 to 2.4 dBm]
Rx power Network Lane[12] = -40.0 dBm (0.0 in units of mW) [Range:-9.5 to 2.4 dBm]
Rx power Network Lane[13] = -40.0 dBm (0.0 in units of mW) [Range:-9.5 to 2.4 dBm]
Rx power Network Lane[14] = -40.0 dBm (0.0 in units of mW) [Range:-9.5 to 2.4 dBm]
Rx power Network Lane[15] = -40.0 dBm (0.0 in units of mW) [Range:-9.5 to 2.4 dBm]
Bias Current Network Lane[00] = 6.262 (in units of mA) [Range:0.0 to 43.520 mA]
Bias Current Network Lane[01] = 5.756 (in units of mA) [Range:0.0 to 43.520 mA]
Bias Current Network Lane[02] = 6.304 (in units of mA) [Range:0.0 to 43.520 mA]
Bias Current Network Lane[03] = 6.178 (in units of mA) [Range:0.0 to 43.520 mA]
Bias Current Network Lane[04] = 6.194 (in units of mA) [Range:0.0 to 43.520 mA]
Bias Current Network Lane[05] = 6.84 (in units of mA) [Range:0.0 to 43.520 mA]
Bias Current Network Lane[06] = 6.198 (in units of mA) [Range:0.0 to 43.520 mA]
Bias Current Network Lane[07] = 6.176 (in units of mA) [Range:0.0 to 43.520 mA]
Bias Current Network Lane[08] = 6.160 (in units of mA) [Range:0.0 to 43.520 mA]
Bias Current Network Lane[09] = 5.556 (in units of mA) [Range:0.0 to 43.520 mA]
Bias Current Network Lane[10] = 0.0 (in units of mA) [Range:0.0 to 43.520 mA]
Bias Current Network Lane[11] = 0.0 (in units of mA) [Range:0.0 to 43.520 mA]
Bias Current Network Lane[12] = 0.0 (in units of mA) [Range:0.0 to 43.520 mA]
Bias Current Network Lane[13] = 0.0 (in units of mA) [Range:0.0 to 43.520 mA]
Bias Current Network Lane[14] = 0.0 (in units of mA) [Range:0.0 to 43.520 mA]
Bias Current Network Lane[15] = 0.0 (in units of mA) [Range:0.0 to 43.520 mA]
IDPROM for transceiver HundredGigE1/0/0:
Description = CPAK optics (type 131)
Transceiver Type: = CPAK 100GE SR10 (313)
Product Identifier (PID) = CPAK-100G-SR10
Vendor Revision = 01
Serial Number (SN) = FBN181720831
Vendor Name = CISCO
Vendor OUI (IEEE company ID) = 00.00.0C (12)
CLEI code = WOTRC5PBAA
Cisco part number = 800-41495-
Device State = Enabled.
Date code (yyyy/mm/dd) = 2014/04/24
Connector type = MPO.
Encoding = NRZ, Non-PSK.
Bit Rate = 111.8 Gbps
Maximum Bit Rate Network Lane = 11.2 Gbits/s
Maximum Bit Rate Host Lane = 11.2 Gbits/s
```

show interfaces <interface> transceiver detail

The **show interfaces <interface> transceiver details** command displays combined results of **show hw-mod subslot transceiver idprom brief** and **show hw-mod sub transceiver idprom dump** commands for a specific interface on the router. The output also includes error optics information from the line card console and alarm status, if CPAK transceivers are installed in the router.

show interfaces[*interface-typeslot/subslot/port*] **transceiver detail**

Syntax Description

interface-type	Interface type; possible valid values are pos, atm, ethernet, fastethernet, gigabitethernet, tengigabitethernet, fortygigabitethernet, hundredGigE.
slot	Number of the router slot.
subslot	Secondary slot number on a SIP where a SPA is installed.
port	Port number

Command Modes

Privileged EXEC(#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Examples

The following is sample output from the **show interfaces <interface> transceiver detail** command:

```
Router# show interfaces hundredGigE 1/0/0 transceiver
IDPROM for transceiver HundredGigE1/0/0:
Description = CPAK optics (type 131)
Transceiver Type: = CPAK 100GE SR10 (313)
Product Identifier (PID) = CPAK-100G-SR10
Vendor Revision = 01
Serial Number (SN) = FBN181720831
Vendor Name = CISCO
Vendor OUI (IEEE company ID) = 00.00.0C (12)
CLEI code = WOTRC5PBAA
Cisco part number = 800-41495-
Device State = Enabled.
Date code (yyyy/mm/dd) = 2014/04/24
Connector type = MPO.
Encoding = NRZ, Non-PSK.
Bit Rate = 111.8 Gbps
Maximum Bit Rate Network Lane = 11.2 Gbits/s
Maximum Bit Rate Host Lane = 11.2 Gbits/s
Phased Initialization
Phase Reached: 5
Phase Exit Code: Success 0
Phase Read Offset: 0x80
Socket Verification
Compatibility: Compatibility passed
Security: Security passed
Idprom Contents (hex)
(CPAK NVR1 Table - addr 0x8000-0x807F)
000: 01 21 09 03 00 00 00 00 1E AA
010: 4A 38 38 00 0A 00 0A 01 83 40
```

```
020: 86 60 00 00 00 04 40 50 26 17
030: 14 46 00 43 49 53 43 4F 20 20
040: 20 20 20 20 20 20 20 20 20 00
050: 00 0C 38 30 30 2D 34 31 34 39
060: 35 2D 30 31 20 20 20 20 46 42
070: 4E 31 38 31 37 32 30 38 33 31
080: 20 20 20 20 32 30 31 34 30 34
090: 32 34 00 00 57 4F 54 52 43 35
100: 50 42 41 41 6E 5A 00 05 02 03
110: 0C 03 0F 20 01 01 08 00 FE 01
120: 00 00 00 02 03 00 00 FC
Threshold Data (hex)
CPAK NVR2 Table - address 0x8080-0x80FF
000: 4B 00 46 00 00 00 FB 00 8A 00
010: 87 5A 7A 76 77 E2 00 00 00 00
020: 00 00 00 00 00 00 00 00 00 00
030: 00 00 00 00 00 00 00 00 00 00
040: 13 88 11 94 05 DC 03 E8 45 76
050: 22 D0 06 C9 03 66 5A 00 55 00
060: 00 00 FB 00 88 71 43 E2 04 62
070: 02 32 00 00 00 00 00 00 00 00
080: 00 00 00 00 00 00 00 00 00 00
090: 00 00 00 00 00 00 00 00 00 00
100: 00 00 00 00 00 00 00 00 00 00
110: 00 00 00 00 00 00 00 00 00 00
120: 00 00 00 00 00 00 00 93
Vendor Idprom Contents (hex)
Vendor Cisco NVR1 Table - address 0x8400-0x847F
000: 02 00 00 00 00 00 00 00 00 00
010: 00 00 00 00 00 00 43 49 53 43
020: 4F 20 20 20 20 20 20 20 20 20
030: 20 20 43 50 41 4B 2D 31 30 30
040: 47 2D 53 52 31 30 20 20 56 45
050: 53 31 07 46 42 4E 31 38 31 37
060: 32 30 38 33 38 30 30 2D 34 31
070: 34 39 35 2D 30 31 30 31 20 20
080: 00 00 00 00 00 00 00 00 00 00
090: 00 32 38 2D 31 31 30 32 30 2D
100: 30 34 00 00 00 00 00 00 00 00
110: 00 00 00 00 00 00 00 00 00 00
120: 00 00 00 00 00 00 00 1B
Vendor Idprom Contents 2 (hex)
Vendor CISCO NVR2 Table - address 0x8480-0x84FF
000: 00 00 00 00 00 00 00 00 00 00
010: 00 00 00 00 00 00 00 00 00 00
020: 00 00 00 00 00 00 00 00 00 00
030: 00 00 41 46 45 30 34 30 46 52
040: 20 20 20 20 20 20 20 20 41 46
050: 45 30 34 42 47 55 20 20 20 20
060: 20 20 20 20 00 00 00 00 00 00
070: 00 00 00 00 00 00 00 00 00 00
080: 53 52 31 34 34 30 31 30 37 39
090: 2D 30 36 20 20 20 00 00 00 00
100: 00 00 00 00 00 00 00 00 00 00
110: 00 00 00 00 00 00 00 00 00 00
120: 00 00 00 00 00 00 00 38
Module State Register: 0x0020
Module General Control Register: 0x0000
Global Alarm Status: 0x0000
Network Lanes Alarm and Warning Status: 0x0000
Network Lanes Fault Status Summary: 0x0000
Host Lanes Fault Status Summary: 0x0000
Module Fault and Warning, General Status Summary: 0x0002
Module Fault and Warning, Fault Status Summary: 0x0000
```

```
Fault and Warning status, Alarms and Warning 1: 0x0000
Multimode fiber supported length = 100 m
Enhanced options implemented:
Host Lane PRBS Supported
Enhanced options 2 implemented:
none
Diagnostic monitoring implemented:
Transmitted power measurement type
Received power measurement type
Diagnostic monitoring capability 1:
Transceiver temperature monitor
Transceiver power supply voltage monitor
Diagnostic monitoring capability 2:
Network Lane laser temperature monitor
Network Lane laser bias current monitor
Network Lane laser output power monitor
Network Lane received power monitor
```

show interfaces trunk

To display the interface-trunk information, use the **showinterfacestrunk** command in user EXEC or privileged EXEC mode.

show interfaces [*interface interface-number*] **trunk** [**module** *number* | **vlan** *vlan*]

Syntax Description

interface	(Optional) Interface type; possible valid values are **ethernet**, **fastethernet**, **gigabitethernet**, **tengigabitethernet**, **pos**, **atm**, and **ge-wan**.
interface-number	(Optional) Module and port number; see the "Usage Guidelines" section for valid values.
module *number*	(Optional) Specifies the module number; see the "Usage Guidelines" section for valid values.
vlan *vlan*	(Optional) Limits the display of switch port information to the specified VLAN. Range: 1 to 4094.

Command Default

This command has no default settings.

Command Modes

User EXEC Privileged EXEC

Command History

Release	Modification
12.2(14)SX	Support for this command was introduced on the Supervisor Engine 720.
12.2(17d)SXB	Support for this command on the Supervisor Engine 2 was extended to Release 12.2(17d)SXB.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(33)SXI	This command was changed to add the optional **vlan***vlan* keyword and argument.

Usage Guidelines

The **pos**, **atm**, and **ge-wan** keywords are supported on systems that are configured with a Supervisor Engine 2.

If you do not specify a keyword, only information for trunking ports is displayed.

The *interface-number* designates the module and port number. Valid values depend on the chassis and module that are used. For example, if you have a 48-port 10/100BASE-T Ethernet module that is installed in a 13-slot chassis, valid values for the slot number are from 1 to 13 and valid values for the port number are from 1 to 48.

The **module***number* keyword and argument designate the module number and limit the display to interfaces on the module. Valid values depend on the chassis that is used. For example, if you have a 13-slot chassis, valid values for the module number are from 1 to 13.

Examples

This example shows how to display the interface-trunk information for module 5:

```
Router#
show interfaces trunk module 5
Port      Mode         Encapsulation  Status        Native vlan
```

```
Fa5/1     routed       negotiate      routed        1
Fa5/2     routed       negotiate      routed        1
Fa5/3     routed       negotiate      routed        1
Fa5/4     routed       negotiate      routed        1
Fa5/5     routed       negotiate      routed        1
Fa5/6     off          negotiate      not-trunking  10
Fa5/7     off          negotiate      not-trunking  10
Fa5/8     off          negotiate      not-trunking  1
Fa5/9     desirable    n-isl          trunking      1
Fa5/10    desirable    negotiate      not-trunking  1
Fa5/11    routed       negotiate      routed        1
Fa5/12    routed       negotiate      routed        1
.
.
.
Fa5/48    routed       negotiate      routed        1
Port      Vlans allowed on trunk
Fa5/1     none
Fa5/2     none
Fa5/3     none
Fa5/4     none
Fa5/5     none
Fa5/6     none
Fa5/7     none
Fa5/8     200
Fa5/9     1-1005
Fa5/10    none
Fa5/11    none
Fa5/12    none
.
.
.
Fa5/48    none
Port      Vlans allowed and active in management domain
Fa5/1     none
Fa5/2     none
Fa5/3     none
Fa5/4     none
Fa5/5     none
Fa5/6     none
Fa5/7     none
Fa5/8     200
Fa5/9     1-6,10,20,50,100,152,200,300,303-305,349-351,400,500,521,524,570,801-8
02,850,917,999,1002-1005
Fa5/10    none
Fa5/11    none
Fa5/12    none
.
.
.
Fa5/48    none
Port      Vlans in spanning tree forwarding state and not pruned
Fa5/1     none
Fa5/2     none
Fa5/3     none
Fa5/4     none
Fa5/5     none
Fa5/6     none
Fa5/7     none
Fa5/8     200
Fa5/9     1-6,10,20,50,100,152,200,300,303-305,349-351,400,500,521,524,570,801-8
02,850,917,999,1002-1005
Fa5/10    none
Fa5/11    none
```

```
.
.
.
Fa5/48    none
Router#
```

This example shows how to display the trunking information for active trunking ports:

```
Router#
show interfaces trunk
Port      Mode         Encapsulation  Status        Native vlan
Fa5/9     desirable    n-isl          trunking      1
Port      Vlans allowed on trunk
Fa5/9     1-1005
Port      Vlans allowed and active in management domain
Fa5/9     1-6,10,20,50,100,152,200,300,303-305,349-351,400,500,521,524,570,801-8
02,850,917,999,1002-1005
Port      Vlans in spanning tree forwarding state and not pruned
Fa5/9     1-6,10,20,50,100,152,200,300,303-305,349-351,400,500,521,524,570,801-8
02,850,917,999,1002-1005
Router#
```

This example shows how to limit the display information for interfaces on a specific VLAN:

```
Router> show interfaces trunk vlan 22
Router>
```

Related Commands

Command	Description
show interfaces	Displays the status and statistics for the interfaces in the chassis.

show interfaces tunnel

To display tunnel interface information, use the **showinterfacestunnel** command in privileged EXEC mode.

show interfaces tunnel *number* [**accounting**]

Syntax Description

number	Port line number.
accounting	(Optional) Displays the number of packets of each protocol type that have been sent through the interface.

Command Modes

Privileged EXEC

Command History

Release	Modification
10.0	This command was introduced.
12.2(14)S	This command was integrated into Cisco IOS Release 12.2(14)S.
12.2(28)SB	This command was integrated into Cisco IOS Release 12.2(28)SB.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.4(11)T	Support was added to display traffic information when the **tunnelroute-via** command is present in the configuration file.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
Cisco IOS XE Release 3.11S	This command was integrated into Cisco IOS XE Release 3.11S. The output was modified to display information about tunnel entropy calculation.

Examples

The following is sample output from the **showinterfacestunnel** command.

```
Device# show interfaces tunnel 4

Tunnel4 is up, line protocol is down
Hardware is Routing Tunnel
MTU 1500 bytes, BW 9 Kbit, DLY 500000 usec, rely 255/255, load 1/255
Encapsulation TUNNEL, loopback not set, keepalive set (10 sec)
Tunnel source 0.0.0.0, destination 0.0.0.0
Tunnel protocol/transport GRE/IP, key disabled, sequencing disabled
Tunnel Entropy Calculation Enabled (24-bit Key)
Last input never, output never, output hang never
Last clearing of "show interface" counters never
Output queue 0/0, 0 drops; input queue 0/75, 0 drops
Five minute input rate 0 bits/sec, 0 packets/sec
Five minute output rate 0 bits/sec, 0 packets/sec
0 packets input, 0 bytes, 0 no buffer
Received 0 broadcasts, 0 runts, 0 giants
0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
```

```
0 packets output, 0 bytes, 0 underruns
0 output errors, 0 collisions, 0 interface resets, 0 restarts

Device# show interfaces tunnel 0 | include route-via

Tunnel route-via feature is on [Ethernet0, preferred]

Device# show interfaces tunnel 0 | include route-via

Tunnel route-via feature is on [Ethernet0, mandatory]
```

The table below describes significant fields shown in the display.

Table 53: show interfaces tunnel Field Descriptions

Field	Description
Tunnel is {up | down}	Interface is currently active and inserted into ring (up) or inactive and not inserted (down). On the Cisco 7500 series routers, gives the interface processor type, slot number, and port number.
line protocol is {up | down | administratively down}	Shows line protocol up if a valid route is available to the tunnel destination. Shows line protocol down if no route is available or if the route would be recursive.
Hardware	Specifies the hardware type.
MTU	Maximum transmission unit of the interface.
BW	Bandwidth of the interface, in kilobits per second.
DLY	Delay of the interface, in microseconds.
rely	Reliability of the interface as a fraction of 255 (255/255 is 100 percent reliability), calculated as an exponential average over 5 minutes.
load	Load on the interface as a fraction of 255 (255/255 is completely saturated), calculated as an exponential average over 5 minutes.
Encapsulation	Encapsulation method is always TUNNEL for tunnels.
loopback	Indicates whether loopback is set or not.
keepalive	Indicates whether keepalives are set or not.
Tunnel source	IP address used as the source address for packets in the tunnel.
destination	IP address of the host destination.
Tunnel protocol	Tunnel transport protocol (the protocol that the tunnel is using). This is based on the **tunnelmode**command, which defaults to GRE.
key	ID key for the tunnel interface, unless disabled.
Tunnel Entropy Calculation	Achieves load balancing of tunnel packets in a network.

Field	Description
sequencing	Indicates whether the tunnel interface drops datagrams that arrive out of order. Can be disabled.
Last input	Number of hours, minutes, and seconds since the last packet was successfully received by an interface and processed locally on the router. Useful for knowing when a dead interface failed. This counter is updated only when packets are process-switched, not when packets are fast-switched.
output	Number of hours, minutes, and seconds since the last packet was successfully transmitted by an interface. This counter is updated only when packets are process-switched, not when packets are fast-switched.
output hang	Number of hours, minutes, and seconds (or never) since the interface was last reset because of a transmission that took too long. When the number of hours in any of the "last" fields exceeds 24 hours, the number of days and hours is printed. If that field overflows, asterisks are printed.
Last clearing	Time at which the counters that measure cumulative statistics (such as number of bytes transmitted and received) shown in this report were last reset to zero. Note that variables that might affect routing (for example, load and reliability) are not cleared when the counters are cleared. *** indicates the elapsed time is too large to be displayed. 0:00:00 indicates that the counters were cleared more than 231 ms (and less than 232 ms) ago.
Output queue, drops Input queue, drops	Number of packets in output and input queues. Each number is followed by a slash, the maximum size of the queue, and the number of packets dropped because of a full queue.
Five minute input rate, Five minute output rate	Average number of bits and packets transmitted per second in the last 5 minutes. The 5-minute input and output rates should be used only as an approximation of traffic per second during a given 5-minute period. These rates are exponentially weighted averages with a time constant of 5 minutes. A period of four time constants must pass before the average will be within two percent of the instantaneous rate of a uniform stream of traffic over that period.
packets input	Total number of error-free packets received by the system.
bytes	Total number of bytes, including data and MAC encapsulation, in the error-free packets received by the system.
no buffer	Number of received packets discarded because there was no buffer space in the main system. Compare with ignored count. Broadcast storms on Ethernet networks and bursts of noise on serial lines are often responsible for no input buffer events.
broadcasts	Total number of broadcast or multicast packets received by the interface.
runts	Number of packets that are discarded because they are smaller than the minimum packet size of them medium.

Field	Description
giants	Number of packets that are discarded because they exceed the maximum packet size of the medium.
CRC	Number of cyclic redundancy checksums generated by the originating LAN station or far-end device that do not match the checksum calculated from the data received. On a LAN, this usually indicates noise or transmission problems on the LAN interface or the LAN bus itself. A high number of CRCs is usually the result of a station transmitting bad data.
frame	Number of packets received incorrectly having a CRC error and a noninteger number of octets.
overrun	Number of times the serial receiver hardware was unable to hand received data to a hardware buffer because the input rate exceeded the receiver's ability to handle the data.
ignored	Number of received packets ignored by the interface because the interface hardware ran low on internal buffers. These buffers are different than the system buffers mentioned previously in the buffer description. Broadcast storms and bursts of noise can cause the ignored count to be increased.
abort	Illegal sequence of one bits on a serial interface. This usually indicates a clocking problem between the serial interface and the data link equipment.
packets output	Total number of messages transmitted by the system.
bytes	Total number of bytes, including data and MAC encapsulation, transmitted by the system.
underruns	Number of times that the far-end transmitter has been running faster than the near-end router's receiver can handle. This may never be reported on some interfaces.
output errors	Sum of all errors that prevented the final transmission of datagrams out of the interface being examined. Note that this may not balance with the sum of the enumerated output errors, because some datagrams may have more than one error, and others may have errors that do not fall into any of the specifically tabulated categories.
collisions	Number of messages retransmitted because of an Ethernet collision. Some collisions are normal. However, if your collision rate climbs to around 4 or 5 percent, you should consider verifying that there is no faulty equipment on the segment and/or moving some existing stations to a new segment. A packet that collides is counted only once in output packets.
interface resets	Number of times an interface has been reset. The interface may be reset by the administrator or automatically when an internal error occurs.
restarts	Number of times that the controller was restarted because of errors.
preferred	If the route is not available, forwards the traffic using any available route.

Field	Description
mandatory	Drops the traffic if the route is not available.

Related Commands

Command	Description
show interfaces	Displays statistics for all interfaces configured on the router or access server.
show ip route	Displays the current state of the routing table.

show interfaces ucse

To display Cisco UCS E-Series Server interface statistics, use the **show interfaces ucse** command in privileged EXEC mode.

show interfaces ucse *slot/subslot/ucse-interface* [**accounting** | **controller** | **counters** | **crb** | **dampening** | **description** | **etherchannel** | **history** | **irb** | **mac-accounting** | **monitor** | **mpls-exp** | **precedence** | **stats** | **summary** | **switchport**]

Syntax Description

slot/	Number of the router slot in which the server module is installed. **Note** For the NIM E-Series NCE, the slot number is 0.
subslot	Number of the subslot in which the server module is installed. **Note** For Cisco UCS E-Series Servers and the SM E-Series NCE, the subslot number is 0.
ucse-interface	Number of the UCSE interface. **Note** For Cisco UCS E-Series Servers, the UCSE interface number can be 0 or 1.
accounting	(Optional) Displays the number of packets of each protocol type that have been sent through the interface.
controller	(Optional) Displays the interface, configuration, and controller status.
counters	(Optional) Displays the interface counters.
crb	(Optional) Displays interface routing or bridging information.
dampening	(Optional) Displays interface dampening information.
description	(Optional) Displays the interface description.
etherchannel	(Optional) Displays interface Ether Channel information.
history	(Optional) Displays interface history.
irb	(Optional) Displays interface routing or bridging information.
mac-accounting	(Optional) Displays interface MAC accounting information.
monitor	(Optional) Displays interface continuously.
mpls-exp	(Optional) Displays interface Multiprotocol Label Switching (MPLS) experimental accounting information.
precedence	(Optional) Displays interface precedence accounting information.

stats	(Optional) Displays the switching path, the packets in and packets out, and the characters in and characters out.
summary	(Optional) Displays the interface summary.
switchport	(Optional) Displays the switch port interface information.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Release 3.9S	This command was introduced on the Cisco UCS E-Series Servers installed in the Cisco 4400 Series Integrated Services Router (ISR).
Cisco IOS XE Release 3.15S	This command was supported on an additional platform: the NIM E-Series Network Compute Engine (NIM E-Series NCE) installed in a Cisco ISR 4000 Series.

Examples

The following example provides sample output from the **show interfaces ucse** *slot*/**0/0 switchport** command in an E-Series Server installed in a Cisco ISR 4000 series:

```
Router# show interfaces ucse 1/0/0 switchport

 Name: ucse 1/0/0
 Switchport: Enabled
 Administrative mode: trunk
 Operational Mode: trunk
 Administrative Trunking Encapsulation: dot1q
 Operational Trunking Encapsulation: native
 Negotiation of Trunking: Disabled
 Trunking Native Mode VLAN: 2352
 Trunking VLANs Enabled: 1-2349,2450-4094
 Voice VLAN: none
```

show interfaces unidirectional

To display the operational state of an interface with a receive-only transceiver, use the **showinterfacesunidirectional** command in user EXEC or privileged EXEC mode.

show interfaces [*interface interface-number*] **unidirectional** [**module** *number*]

Syntax Description

interface	(Optional) Interface type; possible valid values are **gigabitethernet** and **tengigabitethernet**
interface-number	(Optional) Module and port number; see the "Usage Guidelines" section for valid values.
module *number*	(Optional) Specifies the module number; see the "Usage Guidelines" section for valid values.

Command Default

This command has no default settings.

Command Modes

User EXEC Privileged EXEC

Command History

Release	Modification
12.2(18)SXE	Support for this command was introduced on the Supervisor Engine 720.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

Usage Guidelines

If you do not specify a keyword, only information for trunking ports is displayed.

The *interface-number* designates the module and port number. Valid values depend on the chassis and module that are used. For example, if you have a 48-port 10/100BASE-T Ethernet module that is installed in a 13-slot chassis, valid values for the slot number are from 2 to 13 and valid values for the port number are from 1 to 48.

The **module***number* keyword and argument designate the module number and limit the display to interfaces on the module. Valid values depend on the chassis that is used. For example, if you have a 13-slot chassis, valid values for the module number are from 2 to 13.

Examples

This example shows how to display the operational state of an interface with a receive-only transceiver:

```
Router# show interfaces gigabitethernet 5/2 unidirectional
Unidirectional configuration mode: send only
Unidirectional operational mode: receive only
CDP neighbour unidirectional configuration mode: off
Router#
```

Related Commands

Command	Description
show interfaces status	Displays the interface status or a list of interfaces in an error-disabled state on LAN ports only.
unidirectional	Configures the software-based UDE.

show interfaces vg-anylan

To display the information about the 100VG-AnyLAN port adapter on Cisco 7200 series routers and Cisco 7500 series routers, use the **showinterfacesvg-anylan** command in user EXEC or privileged EXEC mode.

Cisco 7200 Series
show interfaces vg-anylan [*slot*/*port*]

Cisco 7500 Series with VIPs
show interfaces vg-anylan [*slot*/*port-adapter*/*port*]

Syntax Description

slot	(Optional) Slot number. Refer to the appropriate hardware manual for slot and port information.
port	(Optional) Port number. Refer to the appropriate hardware manual for slot and port information.
port-adapter	(Optional) Port adapter number. Refer to the appropriate hardware manual for information about port adapter compatibility.

Command Modes

User EXEC Privileged EXEC

Command History

Release	Modification
11.3	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Examples

The following is sample output from the **showinterfacesvg-anylan** command:

```
Router# show interfaces vg-anylan 3/0/0
VG-AnyLAN3/0/0 is up, line protocol is up
  Hardware is cyBus VG-AnyLAN Interface
  Frame type is 802.3, address is 0060.3e64.2460 (bia 0060.3e64.2460)
  Internet address is 10.1.1.5/16
  MTU 1500 bytes, BW 100000 Kbit, DLY 100 usec, rely 255/255, load 1/255
  Encapsulation ARPA, loopback not set, keepalive set (10 sec)
  ARP type: ARPA, ARP Timeout 04:00:00
  Last input 00:00:26, output 00:00:09, output hang never
  Last clearing of "show interface" counters never
  Queueing strategy: fifo
  Output queue 0/40, 0 drops; input queue 0/75, 0 drops
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
     5316 packets input, 857349 bytes, 0 no buffer
     Received 5310 broadcasts, 0 runts, 0 giants
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     0 input packets with dribble condition detected
     7920 packets output, 754259 bytes, 0 underruns
```

```
0 output errors, 0 collisions, 2 interface resets
0 output buffer failures, 0 output buffers swapped out
0 vg alignment error, 0 vg balance error
0 vg invalid ipm error, 0 vg symbol error
0 vg skew error, 0 vg frame delimit error
0 vg high priority packets, 0 vg high priority octets
0 output errors, 0 collisions, 2 interface resets
0 output buffer failures, 0 output buffers swapped out
0 vg alignment error, 0 vg balance error
0 vg invalid ipm error, 0 vg symbol error
0 vg skew error, 0 vg frame delimit error
0 vg high priority packets, 0 vg high priority octets
```

The table below describes significant fields shown in the display.

Table 54: show interfaces vg-anylan Field Descriptions

Field	Description
VG-AnyLAN3/0/0 is up, line protocol is up	Indicates if the interface hardware is currently active and can transmit and receive or if it has been taken down by an administrator.
Hardware is cyBus VG-AnyLAN	Hardware type.
Frame type is 803.2	Currently the frame type supported is 803.2.
Internet address	Internet address and subnet mask.
MTU	Maximum transmission unit of the interface.
BW	Bandwidth of the interface, in kilobits per second.
DLY	Delay of the interface, in microseconds.
rely	Reliability of the interface as a fraction of 255 (255/255 is 100 percent reliability), calculated as an exponential average over 5 minutes.
load	Load on the interface as a fraction of 255 (255/255 is completely saturated), calculated as an exponential average over 5 minutes. The calculation uses the value from the **bandwidth** interface configuration command.
Encapsulation	Encapsulation method assigned to the interface.
loopback	Indicates if loopbacks are set.
keepalive	Indicates if keepalives are set.
ARA type	ARP type on the interface.
Last input	Number of hours, minutes, and seconds since the last packet was successfully received by an interface and processed locally on the router. Useful for knowing when a dead interface failed. This counter is updated only when packets are process-switched, not when packets are fast-switched.

Field	Description
output	Number of hours, minutes, and seconds since the last packet was successfully transmitted by an interface. This counter is updated only when packets are process-switched, not when packets are fast-switched.
output hang	Number of hours, minutes, and seconds (or never) since the interface was last reset because of a transmission that took too long. When the number of hours in any of the "last" fields exceeds 24 hours, the number of days and hours is printed. If that field overflows, asterisks are printed.
last clearing	Time at which the counters that measure cumulative statistics (such as number of bytes transmitted and received) shown in this report were last reset to zero. Variables that might affect routing (for example, load and reliability) are not cleared when the counters are cleared. *** indicates the elapsed time is too large to be displayed. 0:00:00 indicates the counters were cleared more than 231 ms (and less than 232 ms) ago.
Queueing strategy	First-in, first-out queueing strategy (other queueing strategies that you might see are priority-list, custom-list, and weighted fair).
Output queue, drops input queue, drops	Number of packets in output and input queues. Each number is followed by a slash, the maximum size of the queue, and the number of packets dropped because a queue was full.
5 minute input rate 5 minute output rate	Average number of bits and packets received or transmitted per second in the last 5 minutes.
packets input	Total number of error-free packets received by the system.
bytes (input)	Total number of bytes, including data and MAC encapsulation, in the error-free packets received by the system.
no buffer	Number of received packets discarded because there was no buffer space in the main system. Compare with ignored count. Broadcast storms on Ethernet networks and bursts of noise on serial lines are often responsible for no input buffer events.
broadcasts	Total number of broadcast or multicast packets received by the interface.
runts	Number of packets that are discarded because they are smaller than the minimum packet size of the medium.
giants	Number of packets that are discarded because they exceed the maximum packet size of the medium.
input errors	Total number of no buffer, runts, giants, CRCs, frame, overrun, ignored, and abort counts. Other input-related errors can also increment the count, so that this sum might not balance with the other counts.

Field	Description
CRC	Cyclic redundancy checksum generated by the originating LAN station or far-end device does not match the checksum calculated from the data received. On a LAN, this usually indicates noise or transmission problems on the LAN interface or the LAN bus itself. A high number of CRCs is usually the result of collisions or a station transmitting bad data. On a serial link, CRCs usually indicate noise, gain hits or other transmission problems on the data link.
frame	Number of packets received incorrectly having a CRC error and a noninteger number of octets. On a serial line, this is usually the result of noise or other transmission problems.
overrun	Number of times the serial receiver hardware was unable to hand received data to a hardware buffer because the input rate exceeded the receiver's ability to handle the data.
ignored	Number of received packets ignored by the interface because the interface hardware ran low on internal buffers. These buffers are different than the system buffers mentioned previously in the buffer description. Broadcast storms and bursts of noise can cause the ignored count to be incremented.
abort	Illegal sequence of one bits on the interface.
input packets with dribble condition detected	Dribble bit error indicates that a frame is slightly too long. This frame error counter is incremented just for informational purposes; the router accepts the frame.
packets output	Total number of messages transmitted by the system.
bytes (output)	Total number of bytes, including data and MAC encapsulation, transmitted by the system.
underruns	Number of times that the far-end transmitter has been running faster than the near-end router's receiver can handle.
output errors	Sum of all errors that prevented the final transmission of datagrams out of the interface being examined. Note that this might not balance with the sum of the enumerated output errors, as some datagrams can have more than one error, and others can have errors that do not fall into any of the specifically tabulated categories.
collisions	Number of messages retransmitted because of an Ethernet collision. A packet that collides is counted only once in output packets.
interface resets	Number of times an interface has been completely reset. This can happen if packets queued for transmission were not sent within a certain interval. If the system notices that the carrier detect line of an interface is up, but the line protocol is down, it periodically resets the interface in an effort to restart it. Interface resets can also occur when an unrecoverable interface processor error occurred, or when an interface is looped back or shut down.
output buffer failures	Number of times that a packet was not output from the output hold queue because of a shortage of MEMD shared memory.

Field	Description
output buffers swapped out	Number of packets stored in main memory when the output queue is full; swapping buffers to main memory prevents packets from being dropped when output is congested. The number is high when traffic is bursty.
vg alignment error	Number of nonoctets received.
vg balance error	Number of incorrect balanced symbols received.
vg invalid ipm error	Number of packets received with an invalid packet marker (IPM).
vg symbol error	Number of symbols received that were not correctly decoded.
vg skew error	Number of skews between four pairs of twisted-pair wire that exceeded the allowable skew.
vg frame delimit error	Number of start-of-frame errors or false-start errors received.
vg high priority packets	Number of high-priority packets received.
vg high priority octets	Number of high-priority octets received.

Related Commands

Command	Description
interface vg-anylan	Specifies the interface on a 100VG-AnyLAN port adapter and enters interface configuration mode on Cisco 7200 series routers and Cisco 7500 series routers.