

# Catalyst 2820 and 1900 MIB Extensions

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The Catalyst 2820 and 1900 MIB extensions are grouped into the following categories:

- System Information (sysInfo)
- System Configuration (sysConfig)
- Switched Ports (port)
- Management Console (netMgmt)
- Upgrade Group (upgrade)
- VLAN Group
- Bandwidth Usage Group

These groups and their associated MIB objects are detailed in the following sections.

## System Information

All objects in this group are read-only and return system-wide information. This group is one set of extensions to the MIB II System Group, with some objects serving as mirror images of objects in the System Configuration (sysConfig) Group.

## System Information

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### sysInfoFwdEngineRevision (integer)

This read-only MIB object returns the revision number of the forwarding engine ASIC.

### sysInfoBoardRevision (integer)

This read-only MIB object returns the revision number of the main board on which the Catalyst 2820 or 1900 firmware resides.

### sysInfoTotalNumberOfPorts (integer)

This read-only MIB object displays the total number of physical ports. This MIB object *does not* represent the upper bound of indices into port tables. See `sysInfoNumberOfSwitchPorts` and `sysInfoNumberOfSharedPorts` for that purpose.

Valid Values: 25 to 41

### sysInfoNumberOfSwitchPorts (integer)

This read-only MIB object displays the number of ports that are individually switched. This number includes the high-speed expansion slots. Each of these ports has hardware support for a full range of statistics and management controls. This MIB object represents the upper bound of indices into the various port tables in the port group.

Valid Values: 2  
7

### sysInfoNumberOfSharedPorts (integer)

This read-only MIB object displays the number of ports that are collectively switched. Hardware supported statistics are available for these ports as a whole. Management controls are limited to enabling and disabling of the port.

Valid Values: 0 to 16

### sysInfoNumberOfInstalledModules (counter)

This read-only MIB object displays the number of the Catalyst 2820 high-speed expansion slots with installed and recognized modules. Hardware-supported statistics are available for installed modules. For repeater-group modules, statistics are supported for the group as a whole. Management controls for an individual repeater port on a module are limited to enabling and disabling the port.

Valid Values: 0 to 2

### sysInfoBuffersUsed (gauge)

This read-only MIB object displays the high-water mark of frame buffer usage in this switch.

Valid Values: 28 to 2046

Default Value: 28

### sysInfoMaxBuffers (counter)

This read-only MIB object contains the number of times sysBuffersUsed has reached its maximum value and has been reset to zero by the switch.

### sysInfoUtilDisplay (integer)

This read-only MIB object displays the number of utilization meter LEDs currently lit on the front panel.

Valid Values: 0 to 24

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### sysInfoAddrCapacity (integer)

This read-only MIB object displays the system-wide maximum number of addresses supported. This address capacity includes both dynamic and static address types.

Valid Values:	1024 (Catalyst 1900)
	2048 (Catalyst 2820)
	8192 (Catalyst 2820)

### sysInfoRestrictedStaticAddrCapacity (integer)

This read-only MIB object displays the system-wide maximum number of restricted static addresses supported. This object is a subset of sysInfoAddrCapacity.

Valid Values:	128
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**sysInfoPOSTResult (integer)**

This read-only MIB object displays a bit array, where the presence of a particular bit indicates the failure of one of the power-on self-tests.

The following are valid values:

Bit	POST
2^0	ports
2^1	station address PROM
2^2	content addressable memory
2^3	RS-232 port
2^4	real-time clock
2^5	CAM SRAM
2^6	system timer interrupt
2^7	port control/status
2^8	DRAM
2^9	DRAM
2^10	forwarding engine
2^11	forwarding engine
2^12	–
2^13	–
2^14	–
2^15	ECU DRAM

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### sysInfoPortFailedPOSTMap (octet string)

This read-only MIB object displays a bit array, where the presence of a particular bit indicates a failure of a port, as determined by the POST *individual ports* test.

The following are the valid values:

Bit	Failed Port
2^0	1
2^1	2
2^2	3
2^3	4
2^4	5
2^5	6
2^6	7
2^7	8
2^8	9
2^9	10
2^10	11
2^11	12
2^12	13
2^13	14
2^14	15
2^15	16
2^16	17
2^17	18
2^18	19
2^19	20
2^20	21
2^21	22
2^22	23

Bit	Failed Port
2 <sup>23</sup>	24
2 <sup>24</sup>	25
2 <sup>25</sup>	26
2 <sup>26</sup>	27

**sysInfoPortLinkDisplayMap (octet string)**

This read-only MIB object displays a bit array, where the presence of a particular bit indicates a link beat for a port. If that bit has a value of 1, then the port status LED is on; if the value is 0, the LED is off. The bits are arranged in a series of octets. Within each octet, the most significant bit represents the lowest numbered LED.

**sysInfoPortDisabledDisplayMap (octet string)**

This read-only MIB object displays a bit array where the presence of a particular bit indicates a lit disabled LED for a port. If that bit has a value of 1, then the port status LED is on; if the value is 0, the LED is off. The bits are arranged in a series of octets. Within each octet, the most significant bit represents the lowest numbered LED.

**sysInfoBroadcastStormLastTime (time tick)**

This object is supported by the Catalyst 2820 and 1900 only.

This read-only MIB object returns the last time a port exceeded the broadcast threshold. The port where the event occurred is identified by the object `sysInfoPortExceedBroadcastStorm`. Broadcast packet activity is only monitored if either `sysConfigBroadcastStormAction` is set to block, `sysConfigBroadcastStormAlert` is set to enabled, or both are set as described.

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### sysInfoPortExceedBroadcastStorm (integer)

This object is supported by the Catalyst 2820 and 1900 only.

This read-only MIB object displays the last port that exceeded the broadcast threshold. The time when the event occurred is identified by the object sysInfoBroadcastStormLastTime. Broadcast packet activity is only monitored if either sysConfigBroadcastStormAction is set to block, sysConfigBroadcastStormAlert is set to enabled, or both are set as described.

### sysInfoRedundantPowerState (integer)

This object is supported by the Catalyst 2820 and 1900 only.

This read-only MIB object indicates the state of the redundant power supply. The following are possible values:

- |             |   |
|-------------|---|
| (1) off     | The switch is not connected to a redundant power supply.  |
| (2) healthy | A redundant power supply is connected to the switch, and the power supply is operating correctly. |
| (3) faulty  | A redundant power supply is connected to the switch, but a failure exists in the power system.    |

### sysInfoInternalPowerState (integer)

This object is supported by the Catalyst 2820 and 1900 only.

This read-only MIB object indicates the state of the internal power supply. The following are possible values:

- |         |                                   |
|---------|-----------------------------------|
| (1) off | The internal power supply is off. |
| (2) on  | The internal power supply is on.  |



## System Configuration

This group consists of another set of extensions to the MIB II System Group. All objects in this group are read-write; some objects serve as a definable mirror-image of objects in the System Information (sysInfo) Group.

### sysConfigReset (integer)

Setting this read-write MIB object to reset causes a complete reset of both hardware and software but does not run the POST. All parameters, including all static addresses, are retained.

Setting this object to noReset has no effect. The switch always returns the value noReset when this object is read.

Valid Values: noReset (1)

reset (2)

Default Value: noReset (1)

### sysConfigDefaultReset (integer)

Setting this read-write MIB object to reset causes a complete reset of both hardware and software but does not run the POST. All configuration parameters revert to their factory default settings, and all addresses assigned are removed.

Setting this object to noReset has no effect. The Catalyst 2820 or 1900 always returns the value noReset when this object is read.

Valid Values: noReset (1)

reset (2)

Default Value: noReset (1)

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### sysConfigClearPortStats (integer)

Setting this read-write MIB object to noClear results in no action. When set to clear, the switch resets all port statistics to zero. Port statistics are kept in the switchPortTable, the switchPortTxStatTable, the switchPortRxStatTable, and the switchPortTxCollTable.

This object always returns noClear when read.

Valid Values: noClear (1)

clear (2)

Default Value: noClear (1)

### sysConfigAddressViolationAction (integer)

This read-write MIB object indicates what action to take when an address violation (an address mismatch or duplication) occurs on a secure port.

Available actions include:

- Suspend—Port is suspended until the correct address is again received. While suspended, the port does not forward frames it receives, nor does it accept frames to be forwarded.
- Disable—Port is disabled and does not forward any frames as in the case of suspension above. The port can only be reenabled by explicit management action on the part of the user.
- Ignore—Do nothing to the port (discard the offending address).

Valid Values: suspend (1)

disable (2)

ignore (3)

Default Value: suspend (1)

### sysConfigAddressViolationAlert (integer)

When this read-write MIB object is set to enabled, the Catalyst 2820 or 1900 generates an addressViolation trap upon detecting an address violation on a secure port. When set to disabled, no such trap is issued for address violation on secure ports.

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**Note** The trap manager's IP address must be defined to send traps.

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Valid Values: enabled (1)

disabled (2)

Default Value: enabled (1)

### sysConfigSwitchingMode (integer)

The Catalyst 2820 or 1900 can operate as a high-speed, cut-through switch or as a traditional store-and-forward switch. Cut-through switching of frames is enabled when this read-write MIB object is set to Fast-Forward or FragmentFree. Using cut-through switching reduces the buffering latency by attempting to forward a frame before reception is completed. Cut-through switching does not take effect for frames that are addressed to a broadcast address. These frames are switched using the store-and-forward method. Multicast frames can be switched as set by this MIB object or can be forced to the store-and-forward mode by using the object sysConfigMulticastStoreAndForward.

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The three possible switching modes are as follows:

- Store-and-forward: Buffer the entire frame before forwarding it to the appropriate destination.
- FragmentFree: Forward the frame to its destination after receiving 64 bytes.
- FastForward: Minimize latency by making the forwarding decision as soon as possible during frame reception (after 6 bytes plus preamble).

Valid Values: store-and-forward (1)

FragmentFree (2)

FastForward (3)

Default Value: FastForward (3)

### sysConfigMulticastStoreAndForward (integer)

When this read-write MIB object is set to enabled, the switching of multicast frames uses the store-and-forward method, regardless of the setting of sysConfigSwitchingMode. When set to disabled, multicast frames are switched according to the current setting of sysConfigSwitchingMode.

Valid Values: enabled (1)

disabled (2)

Default Value: disabled (2)

### sysConfigMonitor (integer)

This read-write MIB object selects whether frames to or from certain ports are sent to sysConfigMonitorPort. A port is selected for monitoring purposes when its swPortMonitoring object is set to enabled.

Valid Values: enabled (1)

disabled (2)

Default Value: disabled (2)

### sysConfigMonitorPort (integer)

This read-write MIB object displays the port number to which all frames to or from monitored ports are sent. Frames are only monitored if the sysConfigMonitor object is set to enabled.

Port 0 specifies that frames are to be monitored internally by the switch. A number from 1 to 27 selects a switch port. The number 26 selects port F1 (called port A on the Catalyst 2820), and the number 27 selects port F2 (port B on the Catalyst 2820). The number 31 selects no monitor port.

Valid Values: 0 to sysInfoTotalNumberOfPorts, 31

Default Value: 31

### sysConfigHigherProtocolMonitor (integer)

This read-write MIB object selects whether frames addressed to and from the higher-layer protocol processor of the switch are to be monitored. The higher-layer protocol processor is the entity that responds to all SNMP/TFTP/XNSEcho management requests.

Valid Values: enabled (1)

disabled (2)

Default Value: disabled (2)

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### sysConfigHeuristics (integer)

This read-write MIB object displays a value that enables special heuristic functions to be used by Cisco customer support.

### sysConfigEnableSTP (integer)

The Catalyst 2820 or 1900 switch implements the 802.1d Spanning-Tree Protocol on all its ports to detect loops in the bridge topology. The user can elect to disable the execution of Spanning-Tree Protocol by setting this read-write MIB object to disabled.

When Spanning-Tree Protocol is disabled, all ports currently in suspended-stp status immediately transition to enabled status, and frame forwarding resumes. When Spanning-Tree Protocol is enabled after having been previously disabled, all ports transition to suspended-stp status. Suspended-stp ports transition to enabled according to the Spanning-Tree Protocol.

Valid Values: enabled (1)

disabled (2)

Default Value: enabled (1)

### sysConfigStrictSTPTransition (integer)

The 802.1d Spanning-Tree Protocol dictates that a port must start out in the blocking state and transition through two other intermediate states, listening and learning, before it can begin forwarding frames. These state transitions help prevent temporary loops in the bridge topology.

The switch implements a special algorithm whereby a single address port can move to the forwarding state as soon as it is enabled after having been suspended for address violation or jabber. In the strictest sense, this does not comply with the 802.1d Spanning-Tree Protocol. To force compliance, set this read-write MIB object to enabled.

Valid Values: enabled (1)

disabled (2)

Default Value: disabled (2)

### sysConfigBroadcastStormAction (integer)

This object is supported by the Catalyst 2820 and 1900 only.

This read-write MIB object indicates the action to take when a port exceeds the broadcast threshold.

Valid Values: block (1)

ignore (2)

Default Value: ignore (2)

### sysConfigBroadcastStormAlert (integer)

This object is supported by the Catalyst 2820 and 1900 only.

This read-write MIB object generates an alert indicating that the rate of broadcast packets received from a port has exceeded the specified broadcast threshold. The broadcast rate is the number of packets received from a port in a second.

Valid Values: enabled (1)

disabled (2)

Default Value: disabled (2)

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### sysConfigBroadcastThreshold (integer)

This object is supported by the Catalyst 2820 and 1900 only.

This read-write MIB object is the user-defined broadcast threshold. If sysConfigBroadcastStormAction is set to block, the switch stops forwarding broadcast packets received from a port when the number of broadcast packets received from the port exceeds this number.

Valid Values: 10 to 14400

Default Value: 500

### sysConfigBroadcastReEnableThreshold (integer)

This object is supported by the Catalyst 2820 and 1900 only.

This read-write MIB object is the re-enable threshold for broadcast storm control. When the forwarding of broadcast packets from a port has been blocked, the number of broadcast packets from the port must drop below this number for forwarding to be reenabled.

Valid Values: 10 to 14400

Default Value: 250

## Switched Ports

This group of extensions provides for the configuration and management of individual switched ports.

## Port Configurations

This group of extensions provide general configurations, some of which are read-only, some of which are read-write, for a corresponding port.



### switchPortTable

This read-only MIB object displays a list of configuration entries for individually switched ports.

### swPortIndex (integer)

This read-only MIB object displays a number from 1 to sysInfoNumberOfSwitchPorts identifying an individually switched port. The same value of a port index variable for any of the port tables in this MIB group selects the same port.

### swPortControllerRevision (integer)

This read-only MIB object returns the revision number of the port controller.

### swPortName (display string)

This read-write MIB object contains a descriptive string of up to 60 characters used by the network administrator to name a port.

### swPortMediaCapability (integer)

This read-only MIB object displays the port media capability, which is one of the following:

- Other: none of the following
- Private-ethernet: dedicated 10-Mbps Ethernet port
- General-ethernet: nondedicated 10-Mbps Ethernet port
- General-fast-ethernet: nondedicated 100-Mbps Ethernet port
- Private-fast-ethernet: dedicated 100-Mbps Ethernet port

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- Repeated-fast-ethernet: repeated 100-Mbps Ethernet port
- FDDI: FDDI module

Valid Values: other (1)

private-ethernet (2)

general-ethernet (3)

general-fast-ethernet (4)

private-fast-ethernet (5)

repeated-fast-ethernet (6)

fddi (7)

### swPortType (integer)

This read-only MIB object identifies the port as one of the following:

- Other
- Network: Port does not have address number restriction while it is unsecured. A secure network port has an imposed limit on the maximum number of addresses it can have. See the object swPortAddressTableSize for this upper maximum value.

Valid Values: other (1)

network (2)

Default Value: network (2)

**swPortConnectorType (integer)**

This read-only MIB object displays the type of connector the port is currently using. It is one of the following:

- Other: none of the following (unknown)
- RJ-45: common unshielded twisted-pair connector
- BNC: thin-coaxial (BNC)
- AUI: thick-coaxial (AUI)
- Fiber-SC: fiber-optic SC Fast Ethernet connector
- Fiber-ST: fiber-optic ST Fast Ethernet connector
- Empty: port is not installed
- Group: switch port contains a group of connectors
- FDDI-mic: FDDI fiber-optic MIC connector

Valid Values:

other	(1)
rj45	(2)
bnc	(3)
au	(4)
fiber-sc	(5)
fiber-st	(6)
empty	(7)
group	(8)
fddi-mic	(10)

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### swPortFullDuplex (integer)

Set this read-write MIB object to enabled to enable full-duplex transmission on a 100-Mbps port. In this mode, a port allows simultaneous transmit and receive, which can double its bandwidth. Set this object to disabled to operate in normal half-duplex mode. This object cannot be set to enabled for a 10-Mbps port; doing so results in badValue.

Valid Values: enabled (1)

disabled (2)

Default Value: disabled (2)

### swPortStatus (integer)

This read-only MIB object displays the current operational status of the port. Any swPortStatus of type disabled-xxxxxx (except disabled-self-test) is saved across a system reset, so a port can also have such a status.

The following are possible statuses:

- Enabled: normal operation (transmit and receive)
- Disabled-mgmt: disabled by explicit management action
- Suspended-linkbeat: suspended due to absence of linkbeat
- Suspended-jabber: suspended because port is jabbering
- Suspended-violation: suspended due to a secure address violation
- Disabled-violation: disabled due to a secure address violation
- Suspended-not-present: no module inserted in the expansion slot
- Suspended-not-recognized: unrecognized module inserted in the expansion slot
- Reset: port is currently in the reset state
- Suspended-ringdown: suspended due to a ring-down condition
- Suspended-stp: Spanning-Tree Protocol nonforwarding state

- Disabled-self-test: disabled because port fails self-test
- Enabled-degraded: port is still connected but is performing poorly because of errors

Valid Values: enabled	(1)
disabled-mgmt	(2)
suspended-linkbeat	(3)
suspended-jabber	(4)
suspended-violation	(5)
disabled-violation	(7)
suspended-not-present	(9)
suspended-not-recognized	(10)
reset	(11)
suspended-ringdown	(12)
suspended-stp	(13)
disabled-self-test	(14)
enabled-degraded	(15)

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### swPortAdminStatus (integer)

This read-write MIB object is used to change the port status to either:

- Enabled: normal status (transmit and receive)
- Disabled-mgmt: transmit and receive disabled

Valid Values: enabled (1)

disabled-mgmt (2)

Default Value: enabled (1)

**swPortLastStatus (integer)**

This read-only MIB object displays the value of swPortStatus prior to its current value or enabled, if swPortStatusChanges is zero.

Valid Values: enabled	(1)
disabled-mgmt	(2)
suspended-linkbeat	(3)
suspended-jabber	(4)
suspended-violation	(5)
disabled-violation	(7)
suspended-not-present	(9)
suspended-not-recognized	(10)
reset	(11)
suspended-ringdown	(12)
suspended-stp	(13)
disabled-self-test	(14)
enable-degraded	(15)

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### swPortStatusChanges (counter)

This read-only MIB object returns the number of times swPortStatus has changed.

### swPortAddressingSecurity (integer)

This read-write MIB object is set to enabled to secure a port and to disabled to leave the port unsecure.

Valid Values: enabled (1)

disabled (2)

Default Value: disabled (2)

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**Note** For more information about this MIB object, see the *Catalyst 2820 and Catalyst 1900 User Guide*.

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### swPortAddressTableSize (integer)

This read-write MIB object is for specifying the address table size. For a secure network port, the address table size can range from 1 to 132. For an unsecure network port, the size is unrestricted (shown as the value zero) and is, therefore, not settable. Any attempt to violate these rules results in a badValue error.

Valid Values: 0 to 132

Default Value: 132

### swPortNumberOfLearnedAddresses (integer)

This read-only MIB object displays the current number of dynamically learned addresses on the port.



**swPortNumberOfStaticAddresses (integer)**

This read-only MIB object displays the current number of statically assigned unicast addresses on the port.

**swPortEraseAddresses (integer)**

This read-write MIB object is set to delete all learned and assigned static unicast addresses on a given port. Setting the object to noErase has no effect. This object always returns noErase when read.

Valid Values: noErase (1)

erase (2)

Default Value: noErase (1)

**swPortFloodUnregisteredMulticasts (integer)**

This read-write MIB object is set to enabled to allow the forwarding to this port frames addressed to multicast addresses that have not been registered for the port. Set it to disabled to filter and discard such frames.

Valid Values: enabled (1)

disabled (2)

Default Value: enabled (1)

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### swPortFloodUnknownUnicasts (integer)

This read-write MIB object controls the forwarding of unknown unicast frames to this port. When set to enabled, a frame with an unknown unicast destination address received on another port is transmitted to this port. When set to disabled, unknown unicast frames are filtered and not transmitted to this port.

Valid Values: enabled (1)

disabled (2)

Default Value: enabled (1)

### swPortMonitoring (integer)

This read-write MIB object is set to enabled to forward receive-and-transmit frames on this port to the port identified by sysConfigMonitorPort. Set it to disabled to not monitor frame traffic on this port.

Valid Values: enabled (1)

disabled (2)

Default Value: disabled (2)

### swPortSecuredAddressViolations (counter)

This read-only MIB object returns the number of times a source address was seen on a port that duplicates a secure address configured on another port, plus the number of times a source address was seen on the port that did not match any other secured addresses.

**swPortLinkbeatStatus (integer)**

This read-only MIB object displays the current port linkbeat status.

Valid Values: linkbeat (1)

noLinkbeat (2)

**swPortLinkbeatLosses (counter)**

This read-only MIB object returns the number of times that the value of swPortLinkbeatStatus has changed from linkbeat to noLinkbeat.

**swPortJabberStatus (integer)**

This read-only MIB object displays the current port jabber status.

Valid Values: notJabbering (1)

jabbering (2)

**swPortJabbers (counter)**

This read-only MIB object returns the number of times that the jabber function has to be invoked because a frame transmitted from this port exceeded a certain time duration.

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### swPortClearStatistics (integer)

This read-write MIB object is set to clear all statistics associated with the port. Per-port statistics are kept in this swPortTable as well as in the swPortRxStatTable, swPortTxStatTable, swPortTxCollTable, dot1dBasePortTable, and dot1dTpPortTable. Setting this object to noClear has no effect. This object always returns noClear when read.

Valid Values: noClear (1)

clear (2)

Default Value: noClear (1)

### swPortBroadcastStormBlocked (integer)

This object is supported by the Catalyst 2820 and 1900 only.

This read-only MIB indicates the current broadcast forwarding status of this port. If the port is blocked by broadcast storm control, the switch drops all broadcasts received from the port.

Valid Values: notBlocked (1)

blocked (2)

## The Switch Port Receive Statistics Table

These statistics are related to reception activities on the ports.

### switchPortRxStatTable

This read-only MIB object displays a list of switch port-receive statistics entries.

### swPortRxStatIndex (integer)

This read-only MIB object displays a number from 1 to sysInfoNumberOfSwitchPorts identifying an individually switched port. The same value of a port index variable for any of the port tables in this MIB group selects the same port.

### swPortRxTotalFrames (counter)

This read-only MIB object returns a count of all frames that are successfully received. This does not include frames received with frame-too-long, FCS, length, or alignment errors, or frames lost due to an internal MAC sublayer error.

### swPortRxTotalOctets (counter)

This read-only MIB object returns a count of data and padding octets in all frames that are successfully received. This does not include octets in frames received with frame-too-long, FCS, length or alignment errors, or frames lost due to an internal MAC sublayer error.

### swPortRxTotalOctetsWraps (counter)

This read-only MIB object contains the number of times the value in swPortRxTotalOctets has rolled to zero.

### swPortRxUnicastFrames (counter)

This read-only MIB object displays a count of frames that were successfully received and directed to a unicast address. This does not include frames received with frame-too-long, FCS, length or alignment errors, or frames lost due to an internal MAC sublayer error.

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### swPortRxUnicastOctets (counter)

This read-only MIB object returns a count of data and padding octets in unicast frames that were successfully received. This does not include octets in frames received with frame-too-long, FCS, length or alignment errors, or frames lost due to an internal MAC sublayer error.

### swPortRxUnicastOctetsWraps (counter)

This read-only MIB object displays the number of times the value in swPortRxUnicastOctets has rolled to zero.

### swPortRxBroadcastFrames (counter)

This read-only MIB object contains a count of frames that were successfully received and directed to the broadcast address. This does not include frames received with frame-too-long, FCS, length or alignment errors, or frames lost due to an internal MAC sublayer error.

### swPortRxBroadcastOctets (counter)

This read-only MIB object returns a count of data and padding octets in broadcast frames that were successfully received. This does not include octets in frames received with frame-too-long, FCS, length, or alignment errors or frames lost due to an internal MAC sublayer error.

### swPortRxBroadcastOctetsWraps (counter)

This read-only MIB object displays the number of times the value in swPortRxBroadcastOctets has rolled to zero.

### swPortRxMulticastFrames (counter)

This read-only MIB object contains a count of frames that were successfully received and directed to a multicast address. This does not include frames received with frame-too-long, FCS, length, or alignment errors or frames lost due to an internal MAC sublayer error.

### swPortRxMulticastOctets (counter)

This read-only MIB object returns a count of data and padding octets in multicast frames that were successfully received. This does not include octets in frames received with frame-too-long, FCS, length, or alignment errors or frames lost due to an internal MAC sublayer error.

### swPortRxMulticastOctetsWraps (counter)

This read-only MIB object displays the number of times the value in swPortRxMulticastOctets has rolled to zero.

### swPortRxForwardedFrames (counter)

This read-only MIB object contains a count of frames received and forwarded to other port or ports for transmission.

### swPortRxFilteredFrames (counter)

This read-only MIB object contains a count of frames received that were discarded for one of the following reasons:

- The frames were local to the segment.
- No destination address matches could be found, and no ports were set up to accept such frames.
- The destination addresses matched, but source port specific information prevented their forwarding.
- The destination addresses matched, but no destination ports were specified for them.
- The destinations were nonregistered multicasts, and no ports were configured to accept them.

### swPortRxNoBufferDiscards (counter)

This read-only MIB object returns a count of frames received that were discarded due to a lack of frame-buffer resources in the switch's forwarding engine.

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### swPortRxFCSerrors (counter)

This read-only MIB object displays a count of frames received that are an integral number of octets in length but do not pass the Frame Check Sequence test.

### swPortRxAlignmentErrors (counter)

This read-only MIB object returns a count of frames received that are not an integral number of octets in length and do not pass the Frame Check Sequence test.

### swPortRxFrameTooLongs (counter)

This read-only MIB object displays a count of frames received that exceed the maximum permitted frame size as defined by the corresponding ifMtu object.

### swPortRxBroadcasts (counter)

This read-only MIB object returns a count of frames received that are shorter than the minimum permitted frame size. Runt usually indicate collision fragments, a normal network event.

## Switch Port Transmit Statistics

These statistics are related to transmission activities on the ports.

### switchPortTxStatTable

This read-only MIB object displays a list of switch port transmit statistics entries.

### swPortTxStatIndex (integer)

This read-only MIB object displays a number from 1 to sysInfoNumberOfSwitchPorts identifying an individually switched port. The same value of a port index variable for any of the port tables in this MIB group selects the same port.



### swPortTxTotalFrames (counter)

This read-only MIB object returns a count of all frames that were successfully transmitted.

### swPortTxTotalOctets (counter)

This read-only MIB object contains a count of data and padding octets in all frames that were successfully transmitted.

### swPortTxTotalOctetsWraps (counter)

This read-only MIB object contains the number of times the value in swPortTxTotalOctets has rolled to zero.

### swPortTxUnicastFrames (counter)

This read-only MIB object returns a count of frames that were successfully transmitted and directed to a unicast address.

### swPortTxUnicastOctets (counter)

This read-only MIB object displays a count of data and padding octets in unicast frames that were successfully transmitted.

### swPortTxUnicastOctetsWraps (counter)

This read-only MIB object returns the number of times the value in swPortTxUnicastOctets has rolled to zero.

### swPortTxBroadcastFrames (counter)

This read-only MIB object contains a count of frames that are successfully transmitted and are directed to the broadcast address.

## System Information

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### swPortTxBroadcastOctets (counter)

This read-only MIB object displays a count of data and padding octets in broadcast frames that were successfully transmitted.

### swPortTxBroadcastOctetsWraps (counter)

This read-only MIB object returns the number of times the value in swPortTxBroadcastOctets has rolled to zero.

### swPortTxMulticastFrames (counter)

This read-only MIB object displays a count of frames that were successfully transmitted and directed to a multicast address.

### swPortTxMulticastOctets (counter)

This read-only MIB object returns a count of data and padding octets in multicast frames that were successfully transmitted.

### swPortTxMulticastOctetsWraps (counter)

This read-only MIB object returns the number of times the value in swPortTxMulticastOctets has rolled to zero.

### swPortTxDeferrals (counter)

This read-only MIB object contains a count of frames for which the first transmission attempt is delayed because the medium is busy.

### swPortTxSingleCollisions (counter)

This read-only MIB object displays a count of successfully transmitted frames for which transmission is inhibited by exactly one collision.

### swPortTxMultipleCollisions (counter)

This read-only MIB object returns a count of successfully transmitted frames for which transmission is inhibited by more than one collision.

### swPortTxLateCollisions (counter)

This read-only MIB object contains the number of times that a collision is detected later than 512 bit-times into the transmission of a frame. A late collision is also considered as a (generic) collision for purposes of other collision-related statistics.

### swPortTxExcessiveCollisions (counter)

This read-only MIB object returns a count of frames for which transmission fails due to excessive collisions.

### swPortTxExcessiveDeferrals (counter)

This read-only MIB object displays a count of frames for which transmission is deferred for an excessive period of time.

### swPortTxQueueFullDiscards (counter)

This read-only MIB object returns a count of frames that cannot be transmitted because the transmit queue for the port is full.

### swPortTxErrors (counter)

This read-only MIB object returns a count of frames for which transmission fails due to an internal MAC sublayer transmit error. A frame is only counted by an instance of this object if it is not counted by the corresponding instance of one of the following objects:

- swPortTxLateCollisions
- swPortTxExcessiveCollisions

### Management Console

The following MIB objects relate to the switch's management console. You can use them to configure modem communication parameters as well as security features. Use the RS-232-standard MIB (RFC-1317) to configure the physical characteristics of the RS-232 port. See the chapter "EIA/TIA-232 MIB Objects (RFC 1317)" for more information.

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**Note** EIA/TIA-232 was known as recommended standard RS-232 before its acceptance as a standard by the Electronic Industries Association (EIA) and Telecommunications Industry Association (TIA). Because RS-232 appears on the out-of-band management screens and in names of supported MIB objects, this manual also uses RS-232.

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#### netMgmtConsoleInactTime (integer)

This read-write MIB object indicates the number of seconds of management console session inactivity to wait before ending the session. Once a session has ended, you must resupply the console password to regain access.

Valid Values: 0 to 65500 seconds

Default Value: 0 (no time-out)

#### netMgmtConsolePasswordThresh (integer)

This read-write MIB object sets the number of consecutive invalid password attempts allowed before the management console closes for a configured duration. A zero value permits unlimited attempts.

Valid Values: 0 to 65500 seconds

Default Value: 3 seconds

**netMgmtConsoleSilentTime (integer)**

This read-write MIB object sets the number of minutes during which the management console is unavailable after repeated failed attempts to log on.

Valid Values: 0 to 65500 seconds

Default Value: 0 (no silent time)

**netMgmtModemInitString (display string)**

This read-write MIB object is the initialization string used to configure an attached modem. Specify this string with up to 48 characters if the modem is not Hayes-compatible. Only the initialization commands need to be specified. *Do not* specify any modem prefix string such as the AT attention sequence or any suffix such as the CR character.

This string takes effect after every line hang-up.

Default Value: EOV1M1

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**Note** This value is null for Catalyst 2820 and 1900 switches.

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**netMgmtModemDialString (display string)**

This read-write MIB object string of up to 48 characters contains a phone number that is used to establish a modem connection with a remote site. Only the phone number needs to be specified (that is, *do not* specify any dial prefix string such as ATDT).

Leave this string empty if this dial-out capability is not desired. This string takes effect after every line hang-up.

## System Information

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### netMgmtModemDialDelay (integer)

This read-write MIB object specifies a delay in seconds between every dial-out failure. The value zero indicates an infinite delay. Normally, the switch attempts a dial-out if the netMgmtModemDialString object is non-empty. If the remote site then fails to answer and auto-answer has been disabled on this system, the system retries the dial-out attempt after this delay has passed.

If auto-answer is enabled and the first dial-out attempt fails, the system stops further dial-out attempts and immediately goes into auto-answer mode.

Valid Values: 0 to 65500 seconds

Default Value: 300 seconds

### netMgmtModemAutoAnswer (integer)

This read-write MIB object specifies whether the system should be in auto-answer mode and only accept incoming calls.

---

**Note** The system always attempts a dial-out first if the netMgmtModemDialString object is non-empty.

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Valid Values: enabled (1)

disabled (2)

Default Value: enabled (1)

## The Upgrade Group

This group contains a collection of upgrade-facility MIB objects.

### upgradeFirmwareSource (integer)

This read-write MIB object (read-only for Catalyst 2820 and 1900 switches) selects the source from which firmware is read.

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**Note** For Catalyst 2820 and 1900 switches, this object is always set to flash (2).

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A valid selection causes a system reset, followed by the execution of the selected firmware. A valid selection is defined as follows:

- A selection that yields a firmware different from the one currently executing.
- A selection where FLASH memory is available and verifies the firmware via checksum.

Valid Values:   eprom   (1)

                  flash   (2)

Default Value:  eprom   (1)

### upgradeEPROMRevision (display string)

This read-only MIB object returns the revision number of the switch firmware residing in EPROM. The string has the format *V2.01*.

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**Note** For Catalyst 2820 and 1900 switches, this object always returns the flash (2) version information.

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## System Information

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### upgradeFlashSize (integer)

This read-only MIB object displays the size of available FLASH memory in the system, in kilobytes. For example: 128 equals 131,072 bytes (128 bytes times 1024).

### upgradeFlashBankStatus (display string)

This read-only MIB object displays a text string indicating status and version of last upgrade version, including the source of the upgrade version and the date and time of upgrade. The string is in net ASCII and conforms exactly to one of the following formats, depending upon the source of the upgrade:

- V2.01 written on Mon Sep 21 07:02:01 1992 from serial terminal: valid
- V2.01 written on Tue Dec 01 15:19:15 1992 from 192.009.200.200: invalid

### upgradeTFTPServerAddress (IpAddress)

This read-write MIB object contains the IP address of a TFTP server from which a firmware image can be downloaded. The download can be initiated by setting the upgradeTFTPInitiate to upgrade or via an out-of-band management action.

Default Value: 0.0.0.0 or no address

### upgradeTFTPLoadFilename (display string)

This read-write MIB object contains the name of the file of up to 80 characters containing a firmware upgrade image on the host whose address is given by upgradeTFTPServerAddress.

Default Value: empty string, or no filename



### upgradeTFTPInitiate (integer)

Setting this read-write MIB object to noUpgrade results in no action. When set to upgrade, the switch attempts to download a firmware upgrade image from the server whose address is given by upgradeTFTPServerAddress. The image is found in the file whose name is given by upgradeTFTPLoadFilename. Both upgradeTFTPServerAddress and upgradeTFTPLoadFilename must be non-empty for the upgrade to proceed.

This object always returns noUpgrade when read.

Valid Values: upgrade (1)

noUpgrade (2)

Default Value: noUpgrade (2)

### upgradeAutoExecute (integer)

This read-only MIB object is always enabled and indicates that the switch is to immediately begin using new firmware after an upgrade.

## The VLAN Group

### vlanMaxSupported (integer)

This read-only MIB object displays the maximum number of VLANs supported. This object represents the upper bound of the index into the vlanTable.

Valid Values: 4

### vlanAllowMembershipOverlap (integer)



**Caution** Overlapped VLANs can lead to loops or loss of connectivity in the spanning-tree topology and should only be used with caution.

## System Information

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When set to disabled, the switch ensures that no port can simultaneously be a member of more than one VLAN.

Valid Values: enabled (1)

disabled (2)

Default Value: disabled (2)

### vlanTable

This read-only MIB object displays a list of configuration entries for a VLAN.

### vlanIndex (integer)

This read-only MIB object displays the number from 1 to vlanMaxSupported identifying a configured VLAN.

### vlanName (display string)

This read-write MIB object contains a descriptive string of up to 60 characters used by the network administrator to name a VLAN.

### vlanMemberPorts (octet string)

This read-only MIB object displays the set of switch member ports for the VLAN. A port can reside within multiple VLANs only if the object vlanAllowMembershipOverlap has been set to enabled.

This object cannot be used to configure VLAN membership. The table vlanMemberTable is used for that purpose.

Each octet within the value of this object specifies a set of eight ports, with the first octet specifying ports 1 through 8, the second octet specifying ports 9 through 16, and so on. Within each octet, the most significant bit represents the lowest numbered port, and the

least significant bit represents the highest numbered port. Thus, each port of the VLAN is represented by a single bit within the value of this object. If that bit has a value of 1, that port is included in the set of ports; if the value is 0, the port is not included.

Initially, a single VLAN includes all ports.

Default Value: All ports

### **vlanIpAddress (IpAddress)**

This read-write MIB object sets the administrative IP address for this VLAN. Note that once a value has been set for this object, the next write takes effect only after a system reset.

Default Value: same as the address contained in netMgmtIpAddress

### **vlanIpSubnetMask (IpAddress)**

This read-write MIB object contains the administrative IP subnet mask for this VLAN. A change in the subnet mask at any time takes effect immediately.

Default Value: same as the mask contained in netMgmtIpSubnetMask

### **vlanMemberTable**

This read-only MIB object displays a list of port membership configuration entries for a VLAN.

### **vlanMemberIndex (integer)**

This read-only MIB object displays the number from 1 to vlanMaxSupported identifying a configured VLAN.

## System Information

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### vlanMemberPortIndex (integer)

This read-only MIB object displays the number from 1 to sysInfoNumberOfSwitchPorts identifying an individually switched port. The same value of a port index variable for any of the port tables selects the same port.

### vlanMemberPortOfVlan (integer)

This read-write MIB object contains the port identified by vlanMemberPortIndex and becomes a member of the VLAN identified by vlanMemberIndex when this object is set to true. The same port ceases to be member of that VLAN when the object is set to false.

All ports in the switch must belong to some VLAN. Consequently, the switch returns badValue if this object is used to remove the port from all membership lists.

Note that when vlanAllowMembershipOverlap is disabled, a port can only be member of exactly one VLAN. In this case, setting vlanMemberPortOfVlan to true adds the port to the membership list of the current VLAN and removes the same port from all other VLAN membership lists.

When vlanAllowMembershipOverlap is enabled, a port can reside in multiple VLANs. Setting vlanMemberPortOfVlan to true in this case adds the port to the membership list of the current VLAN and does not change other VLAN membership lists.

Valid Values: true (1)

false (2)

## Bandwidth Usage Information

### bandwidthUsageCurrent (counter)

This read-only MIB object displays the bandwidth currently consumed. The measurement unit is in megabits per second (1,000,000 bits/second).

**bandwidthUsagePeakInterval (integer)**

This read-write MIB object specifies the length of time that forms a peak bandwidth capture interval. A write to this object with any new value restarts the peak bandwidth capture at the first interval. In other words, the bandwidthUsagePeakTable is cleared, and entry number 1 records the peak for a new first interval.

Valid Values:	1 hour	(1)
	3 hours	(3)
	6 hours	(6)
	12 hours	(12)
	1 day	(24)
	2 days	(48)
	3 days	(72)
	4 days	(96)
	5 days	(120)
	6 days	(144)
	1 week	(168)
Default Value:	1 day	(24)

## System Information

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### bandwidthUsagePeakRestart (integer)

This read-write MIB object is set to restart to clear the bandwidthUsagePeakTable and restart the peak bandwidth capturing at the current interval. No action is taken if this object is set to noRestart. This object always returned noRestart when read.

Valid Values: noRestart (1)

restart (2)

Default Value: noRestart (1)

### bandwidthUsagePeakTable

This read-only MIB object displays a list of entries containing peak bandwidth usages in a number of time periods.

### bandwidthUsagePeakIndex (integer)

This read-only MIB object displays the number from 1 to bandwidthUsageMaxPeakEntries identifying a particular bandwidthUsagePeakEntry.

### bandwidthUsageStartTime (display string)

This read-only MIB object displays up to 32 characters containing the date and time that marks the start of this capture interval. The string is in net ASCII and conforms exactly to the following format:

Mon Sep 21 07:00:00 1992

### bandwidthUsagePeak (integer)

This read-only MIB object displays the highest bandwidth utilized since the time given in bandwidthUsageStartTime or last cleared. The measurement unit is in megabits per second (1,000,000 bits/second).

### bandwidthUsagePeakTime (display string)

This read-only MIB object displays up to 32 characters containing the date and time the value in bandwidthUsagePeak is captured. The string is in net ASCII and conforms exactly to the following format:

```
Mon Sep 21 07:02:01 1992
```

## System Information

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