Periodic MIB Data Collection and Transfer Mechanism

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This feature provides the ability to periodically transfer selected MIB data from Cisco IOS-based devices to specified Network Management Stations (NMS). Using the CLI, data from multiple MIBs can be grouped into lists, and a polling interval (frequency of data collection) can be configured. All the MIB objects in a list are periodically polled using this specified interval. The collected data from the lists can then be transferred to a specified NMS at a user-specified transfer interval (frequency of data transfer) using TFTP, RCP, or FTP.

History for Periodic MIB Data Collection and Transfer Mechanism

Release	Modification
12.0(24)S	This feature was introduced.
12.3(2)T	This feature was integrated into Cisco IOS Release 12.3(2)T.
12.2(25)S	This feature was integrated into Cisco IOS Release 12.2(25)S.
12.2(33)SRA	This feature was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(33)SXH	This feature was integrated into Cisco IOS Release 12.2(33)SXH.

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Prerequisites for Periodic MIB Data Collection and Transfer Mechanism

To use this feature, you should be familiar with the Simple Network Management Protocol (SNMP) model of management information. You should also know what MIB information you want to monitor on your network devices, and the OIDs or object names for the MIB objects to be monitored.

Restrictions for Periodic MIB Data Collection and Transfer Mechanism

Cisco Data Collection MIB configuration using SNMP is not currently implemented.

For specific restrictions, see the tasks in the "How to Configure Periodic MIB Data Collection and Transfer Mechanism" section on page 4.

Information About Periodic MIB Data Collection and Transfer Mechanism

To configure the Periodic MIB Data Collection and Transfer Mechanism, you must understand the following concepts:

Note In the Cisco IOS CLI, the Periodic MIB Data Collection and Transfer Mechanism is referred to as the Bulk Statistics feature.

SNMP Objects and Instances

A type (or class) of SNMP management information is called an object. A specific instance from a type of management information is called an object instance (or SNMP variable). To configure a bulk statistics collection, you must specify the object types to be monitored using a bulk statistics object list and the specific instances of those objects to be collected using a bulk statistics schema.

MIBs, MIB tables, MIB objects, and object indices can all be specified using a series of numbers called an object identifier (OID). OIDs are used in configuring a bulk statistics collection in both the bulk statistics object lists (for general objects) and in the bulk statistics schemas (for specific object instances).

Bulk Statistics Object Lists

To group the MIB objects to be polled, you will need to create one or more object lists. A bulk statistics object list is a user-specified set of MIB objects that share the same MIB index. Object lists are identified using a name that you specify. Named bulk statistics object lists allow the same configuration to be reused in different bulk statistics schemas.

All the objects in an object list must share the same MIB index. However, the objects do not need to be in the same MIB and do not need to belong to the same MIB table. For example, it is possible to group ifInOctets and an Ethernet MIB object in the same schema, because the containing tables for both objects are indexed by the ifIndex.

Bulk Statistics Schemas

Data selection for the Periodic MIB Data Collection and Transfer Mechanism requires the definition of a schema with the following information:

- Name of an object list.
- Instance (specific or wildcarded) that needs to be retrieved for objects in above object list.
- How often the specified instances need to be sampled (polling interval).

A bulk statistics schema is also identified using a name that you specify. This name is used when configuring the transfer options.

Bulk Statistics Transfer Options

After configuring the data to be collected, a single virtual file (VFile or “bulk statistics file”) with all collected data is created. This file can be transferred to a network management station (NMS) using FTP, RCP, or TFTP. You can specify how often this file should be transferred. The default transfer interval is once every 30 minutes. You can also configure a secondary destination for the file to be used if, for whatever reason, the file cannot be transferred to the primary network management station.

The value of the transfer interval is also the collection period (collection interval) for the local bulk statistics file. After the collection period ends, the bulk statistics file is frozen, and a new local bulk statistics file is created for storing data. The frozen bulk statistics file is then transferred to the specified destination.

By default, the local bulk statistics file is deleted after successful transfer to an NMS. However, you can configure the routing device to keep the bulk statistics file in memory for a specified amount of time.

An SNMP notification (trap) can be sent to the NMS if a transfer to the primary or secondary NMS is not successful. Additionally, a syslog message will be logged on the local device if transfers are unsuccessful.

Benefits of the Periodic MIB Data Collection and Transfer Feature

The Periodic MIB Data Collection and Transfer Mechanism (Bulk Statistics feature) allows many of the same functions as the Bulk File MIB (CISCO-BULK-FILE-MIB.my), but offers some key advantages.

The main advantage is that this feature can be configured through the CLI and does not require an external monitoring application.

The Periodic MIB Data Collection and Transfer Mechanism is mainly targeted for medium to high-end platforms that have sufficient local storage (volatile or permanent) to store bulk statistics files. Locally storing bulk statistics files helps minimize loss of data during temporary network outages.

This feature also has more powerful data selection features than the Bulkfile MIB; it allows grouping of MIB objects from different tables into data groups (object lists). It also incorporates a more flexible instance selection mechanism, where the application is not restricted to fetching an entire MIB table.

How to Configure Periodic MIB Data Collection and Transfer Mechanism

Configuring a Bulk Statistics Object List

The first step in configuring the Periodic MIB Data Collection and Transfer Mechanism is to configure one or more object lists.

Restrictions

All the objects in a bulk statistics object list have to be indexed by the same MIB index. However, the objects in the object list do not need to belong to the same MIB or MIB table.

When specifying an object name instead of an OID (using the **add** command), only object names from the Interfaces MIB (IF-MIB.my), Cisco Committed Access Rate MIB (CISCO-CAR-MIB.my) and the MPLS Traffic Engineering MIB (MPLS-TE-MIB.my) may be used.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **snmp mib bulkstat object-list** *list-name*
4. **add** {*OID* | *object-name*}
5. **exit**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** `Router> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**configure terminal** **Example:** `Router# configure terminal`	Enters global configuration mode.
Step 3	**snmp mib bulkstat object-list** *list-name* **Example:** `Router(config)# snmp mib bulkstat object-list ifMib`	Defines an SNMP bulk statistics object list and enters Bulk Statistics Object List configuration mode.

Step 4	**add** {*OID* | *object-name*}
	
	Example:
	`Router(config-bulk-objects)# add 1.3.6.1.2.1.2.2.1.11`
	`Router(config-bulk-objects)# add ifAdminStatus`
	`Router(config-bulk-objects)# add ifDescr`
	`.`
	`.`
	`.`
		Adds a MIB object to the bulk statistics object list.
		• Repeat as desired until all objects to be monitored in this list are added.
		• For a list of acceptable object names, see Appendix A.

Step 5	**exit** **Example:** `Router(config-bulk-objects)# exit`	Exits from Bulk Statistics Object List configuration mode.

Configuring a Bulk Statistics Schema

The next step in configuring Periodic MIB Data Collection and Transfer is to configure one or more schemas.

Prerequisites

The bulk statistics object list to be used in the schema must be defined.

Restrictions

Only one object list can be associated with a schema at a time.

SUMMARY STEPS

1. **snmp mib bulkstat schema** *schema-name*
2. **object-list** *list-name*
3. **instance**

4. **poll-interval**
5. **exit**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**snmp mib bulkstat schema** *schema-name* **Example:** `Router(config)# snmp mib bulkstat schema intE0`	Names the bulk statistics schema and enters Bulk Statistics Schema (bulkstat-schemadef) configuration mode.
Step 2	**object-list** *list-name* **Example:** `Router(config-bulk-sc)# object-list ifMib`	Specifies the bulk statistics object list to be included in this schema. Specify only one object list per schema. (If multiple **object-list** commands are executed, the earlier ones are overwritten by newer commands.)

Step 3	**instance** {**exact** | **wild**} {**interface** *interface-id* [**sub-if**]| **controller** *controller-id* [**sub-if**] | **oid** *OID*}
	
	Example:
	`Router(config-bulk-sc)# instance wild oid 1`
	
	or
	
	`Router(config-bulk-sc)# instance exact interface FastEthernet 0/1 subif`
		Specifies the instance information for objects in this schema.
		• The **instance exact** command indicates that the specified instance, when appended to the object list, is the complete OID.
		• The **instance wild** command indicates that all subindices of the specified OID belong to this schema. The **wild** keyword allows you to specify a partial, "wild carded" instance.
		• Instead of specifying an instance OID, you can specify a specific interface. The **interface** *interface-id* syntax allows you to specify an interface name and number (for example, interface Ethernet 0) instead of specifying the ifIndex OID for the interface. Similarly, the **controller** *controller-id* syntax allows you to specify a controller card (interface). This option is platform dependent.
		• The optional **sub-if** keyword, when added after specifying an interface or controller, includes the ifIndexes for all subinterfaces of the interface you specified.
		• Only one **instance** command can be configured per schema. (If multiple instance commands are executed, the earlier ones are overwritten by new commands.)

	Command or Action	Purpose
Step 4	**poll-interval** **Example:** `Router(config-bulk-sc)# poll-interval 10`	Sets how often data should be collected from the object instances specified in this schema, in minutes. The default is once every 5 minutes. The valid range is from 1 to 20000.
Step 5	**exit** **Example:** `Router(config-bulk-objects)# exit`	Exits from Bulk Statistics Schema configuration mode.

Configuring a Bulk Statistics Transfer Options

The final step in configuring the Periodic MIB Data Collection and Transfer Mechanism is to configure the transfer options. The collected MIB data are kept in a local file-like entity called a VFile (virtual file, referred to as a bulk statistics file in this document). This file can be transferred to a remote network management station (NMS) at intervals you specify.

Prerequisites

The bulk statistics object lists and bulk statistics schemas should be defined before configuring the bulk statistics transfer options.

Restrictions

Transfers can only be performed using schemaASCII (cdcSchemaASCII) format. SchemaASCII is an ASCII format that contains parser-friendly hints for parsing data values.

SUMMARY STEPS

1. **snmp mib bulkstat transfer** *transfer-id*
2. **buffer-size** *bytes* (optional)
3. **format** {**bulkBinary** | **bulkASCII** | **schemaASCII**} (optional)
4. **schema** *schema-name*
5. **transfer-interval** *minutes* (optional)
6. **url primary** *URL*
7. **url secondary** *URL* (optional)
8. **retry** *number* (optional)
9. **retain** *minutes* (optional)
10. **enable**
11. **exit**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**snmp mib bulkstat transfer** *transfer-id* **Example:** `Router(config)# snmp mib bulkstat transfer bulkstat1`	Identifies the transfer configuration with a name (*transfer-id*) and enters Bulk Statistics Transfer configuration mode.
Step 2	**buffer-size** *bytes* **Example:** `Router(config-bulk-tr)# buffer-size 3072`	(Optional) Specifies the maximum size for the bulk statistics data file, in bytes. The valid range is from 1024 to 2147483647 bytes. The default buffer size is 2048 bytes. **Note** A configurable buffer size limit is available only as a safety feature. Normal bulk statistics files should not generally meet or exceed the default value.
Step 3	**format** {**bulkBinary** | **bulkASCII** | **schemaASCII**} **Example:** `Router(config-bulk-tr)# format schemaASCII`	(Optional) Specifies the format of the bulk statistics data file (VFile). The default is SchemaASCII. **Note** Transfers can only be performed using schemaASCII (cdcSchemaASCII) format. SchemaASCII is a human-readable format that contains parser-friendly hints for parsing data values.

Step 4	**schema** *schema-name*
	
	Example:
	`Router(config-bulk-tr)# schema ATM2/0-IFMIB`
	`Router(config-bulk-tr)# schema ATM2/0-CAR`
	`Router(config-bulk-tr)# schema Ethernet2/1-IFMIB`
	`.`
	`.`
	`.`
		Specifies the bulk statistics schema to be transferred. Repeat this command as desired. Multiple schemas can be associated with a single transfer configuration; all collected data will be in a single bulk data file (VFile).

Step 5	**transfer-interval** *minutes* **Example:** `Router(config-bulk-tr)# transfer-interval 20`	(Optional) Specifies how often the bulk statistics file should be transferred, in minutes. The default value is once every 30 minutes. The transfer interval is the same as the collection interval.

Step 6	**url primary** *URL*
	
	Example:
	`Router(config-bulk-tr)# url primary`
	`ftp://user:password@host/folder/bulkstat1`
		Specifies the network management system (host) that the bulk statistics data file should be transferred to, and the protocol to use for transfer. The destination is specified as a Uniform Resource Locator (URL).
		
		• FTP, RCP, or TFTP can be used for the bulk statistics file transfer.

Step 7	**url secondary** *URL*
	
	Example:
	`Router(config-bulk-tr)# url secondary`
	`tftp://10.1.0.1/tftpboot/user/bulkstat1`
		(Optional) Specifies a backup transfer destination and protocol for use in the event that transfer to the primary location fails.
		
		• FTP, RCP, or TFTP can be used for the bulk statistics file transfer.

	Command or Action	Purpose
Step 8	**retry** *number* **Example:** `Router(config-bulk-tr)# retry 1`	(Optional) Specifies the number of transmission retries. The default value is 0 (in other words, no retries). • If an attempt to send the bulk statistics file fails, the system can be configured to attempt to send the file again using this command. One retry includes an attempt first to the primary destination then, if the transmission fails, to the secondary location; for example, if the retry value is 1, an attempt will be made first to the primary URL, then to the secondary URL, then to the primary URL again, then to the secondary URL again. • The valid range if from 0 to 100.
Step 9	**retain** *minutes* **Example:** `Router(config-bulk-tr)# retain 60`	(Optional) Specifies how long the bulk statistics file should be kept in system memory, in minutes, after the completion of the collection interval and a transmission attempt is made. The default value is 0. • Zero (**0**) indicates that the file will be deleted immediately after a successful transfer. **Note** If the **retry** command is used, you should configure a retain interval larger than 0. The interval between retries is the retain interval divided by the retry number. For example, if **retain 10** and **retry 2** are configured, retries will be attempted once every 5 minutes. Therefore, if retain 0 is configured, no retries will be attempted. • The valid range is from 0 to 20000.

	Command or Action	Purpose
Step 10	**enable** **Example:** `Router(config-bulk-tr)# enable`	Begins the bulk statistics data collection and transfer process for this configuration. • For successful execution of this action, at least one schema with non-zero number of objects should be configured. • Periodic collection and file transfer operations will commence only if this command is configured. Conversely, the **no enable** command will stop the collection process. A subsequent **enable** will start the operations again. • Each time the collection process is started using the **enable** command, data is collected into a new bulk statistics file. When the **no enable** command is used, the transfer process for any collected data will immediately begin (in other words, the existing bulk statistics file will be transferred to the specified management station).
Step 11	**exit** **Example:** `Router(config-bulk-tr)# exit`	Exits from Bulk Statistics Transfer configuration mode.

Troubleshooting Tips

If the maximum buffer size for a bulk statistics file is reached before the transfer interval time expires, the transfer operation will still be initiated, and bulk statistics data will be collected into a new file in the system buffer. To correct this behavior, you can decrease the polling frequency, or increase the size of the bulk statistics buffer. If **retain 0** is configured, no retries will be attempted. This is because the interval between retries is the retain value divided by the retry value. For example, if **retain 10** and **retry 2** are configured, retries will be attempted once every 5 minutes. Therefore, if you configure the **retry** command, you should also configure an appropriate value for the **retain** command.

Enabling Monitoring for Bulk Statistics Collection

Optionally, you can enable SNMP notifications to be sent, which provide information on the transfer status of the Periodic MIB Data Collection and Transfer Mechanism (Bulk Statistics feature).

SUMMARY STEPS

1. **configure terminal**
2. **snmp-server community** *string* [**view** *view-name*] [**ro** | **rw**] [*acl-number*]
3. **snmp-server enable traps bulkstat** [**collection** | **transfer**]
4. **snmp-server host** *host-address* [**traps** | **informs**] [**version** {**1** | **2c** | **3** [**auth** | **noauth** | **priv**]}] *community-string* [**udp-port** *port*] [**bulkstat**]
5. **do copy running-config startup-config**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**configure terminal** **Example:** `Router# configure terminal`	Enters global configuration mode.
Step 2	**snmp-server community** *string* [**view** *view-name*] [**ro** | **rw**] [*acl-number*] **Example:** `Router(config)# snmp-server community public`	Specifies the SNMP community and access options for the device.
Step 3	**snmp-server enable traps bulkstat** [**collection** | **transfer**] **Example:** `Router(config)# snmp-server enable traps bulkstat`	Enables the sending of bulk statistics SNMP notifications (traps or informs). The following notifications (defined in the CISCO-DATA-COLLECTION-MIB) are enabled with this command: • transfer (cdcFileXferComplete)—Sent when a transfer attempt is successful and when a transfer attempt fails. (The varbind cdcFilXferStatus object in the trap defines tells if the transfer is successful or not). • collection (cdcVFileCollectionError)—Sent when data collection could not be carried out successfully.One possible reason for this condition could be insufficient memory on the device to carry out data collection.
Step 4	**snmp-server host** *host-address* [**traps** | **informs**] [**version** {**1** | **2c** | **3** [**auth** | **noauth** | **priv**]}] *community-string* [**udp-port** *port*] [**bulkstat**] **Example:** `Router(config)# snmp-server host informs public bulkstat`	Specifies the recipient (host) for the SNMP notifications, and additional transfer options.
Step 5	**do copy running-config startup-config** **Example:** `Router(config)# do copy running-config startup-config`	(Optional) Saves the current configuration to NVRAM as the startup configuration file. • The **do** command allows you to execute EXEC mode commands in any configuration mode.

Monitoring and Troubleshooting the Periodic MIB Data Collection and Transfer Mechanism

The **show** command for this feature displays the status of the bulk statistics processes. The **debug** command enables the standard set of debugging messages for technical support purposes.

SUMMARY STEPS

1. **show snmp mib bulkstat transfer**
2. **debug snmp bulkstat**

DETAILED STEPS

	Command or Action	Purpose

Step 1	**show snmp mib bulkstat transfer** [*transfer-name*]
	
	Example:
	`Router# show snmp mib bulkstat transfer`
	
	`Transfer Name : ifmib`
	`Retained files`
	
	`File Name : Time Left (in seconds) :STATE`
	`----------`
	`ifmib_Router_020421_100554683 : 173 : Retry (2 Retry attempt(s) Left)`
	
	`ifmib_Router_020421_100554683 : 53 : Retained`
		(Optional) The **show** command for this feature lists all bulk statistics virtual files (VFiles) on the system that have finished collecting data. (Data files that are not complete are not displayed.)
		
		The output lists all of the completed local bulk statistics files, the remaining time left before the bulk statistics file is deleted (remaining retention period), and the state of the bulk statistics file.
		
		The "STATE" of the bulk statistics file will be one of the following:
		• Queued—Indicates that the data collection for this bulk statistics file is completed (in other words, the transfer interval has been met) and that the bulk statistics file is waiting for transfer to the configured destination(s).
		• Retry—Indicates that one or more transfer attempts have failed and that the file transfer will be attempted again. The number of retry attempts remaining will be displayed in parenthesis.
		• Retained—Indicates that the bulk statistics file has either been successfully transmitted or that the configured number of retries have been completed.
		
		Tip To determine if a transfer was successful, enable the bulk statistics SNMP notification.
		
		To display only the status of a named transfer (as opposed to all configured transfers), specify the name of the transfer in the *transfer-name* argument.

Step 2	**debug snmp bulkstat** **Example:** `Router# debug snmp bulkstat`	(Optional) Enables standard debugging output for the Bulk Statistics feature. Debugging output includes messages about the creation, transfer, and deletion of bulk statistics files.

Configuration Examples for Periodic MIB Data Collection and Transfer Mechanism

This section provides the following configuration example:

Configuring Periodic MIB Data Collection and Transfer Mechanism: Example

This section provides a complete example of configuring the Periodic MIB Data Collection and Transfer Mechanism (Bulk Statistics feature). The example is described in the following subsections:

Transfer Parameters

The following transfer parameters were used for the "Configuring the Periodic MIB Data Collection and Transfer Mechanism" example:

- Transfer interval (collection interval)—30 minutes
- Primary URL—ftp://john:pswrd@cbin2-host/users/john/bulkstat1
- Secondary URL—tftp://john@10.1.1.1/tftpboot/john/bulkstat1
- Transfer format—schemaASCII
- Retry interval—Retry after 6 minutes (retry = 5, retain = 30; 5 retry attempts over the 30-minute retention interval.)

Polling Requirements

The following polling requirements for ATM interface 2/0 and Ethernet interface 2/1 were used for the "Configuring the Periodic MIB Data Collection and Transfer Mechanism" example:

ATM interface 2/0

- Objects to be polled—ifInOctets, ifOutOctets, ifInUcastPkts, ifInDiscards, CcarStatSwitchedPkts, CcarStatSwitchedBytes, CcarStatFilteredBytes
- Polling interval—Once every 5 minutes
- Instances—Main interface and all subinterfaces
- For CAR MIB objects, poll all instances related to the specified interface

Ethernet Interface 2/1

- Objects to be polled—ifInOctets, ifOutOctets, ifInUcastPkts, ifInDiscards, CcarStatSwitchedPkts, CcarStatSwitchedBytes, CcarStatFilteredBytes
- Polling interval—Once every 10 minutes
- Instances—Only main interface is to be monitored
- For CAR MIB objects, only include instances pertaining to packets in the incoming direction (on the main interface)

Object List Configuration

Note that since the IF-MIB objects and the CAR-MIB objects do not have the same index, they will have to be a part of different schemas. However, since the objects required are the same for the ATM interface and the Ethernet interface, the object list can be reused for each schema. Therefore, in the following example, an object list is created for the for the IF-MIB objects and another object list is created for the CAR-MIB objects.

```
Router(config)# snmp mib bulkstat object-list ifmib
Router(config-bulk-objects)# add ifInoctets
Router(config-bulk-objects)# add ifOutoctets
Router(config-bulk-objects)# add ifInUcastPkts
Router(config-bulk-objects)# add ifInDiscards
Router(config-bulk-objects)# exit
Router(config)# snmp mib bulkstat object-list CAR-mib
Router(config-bulk-objects)# add CcarStatSwitchedPkts
Router(config-bulk-objects)# add CcarStatSwitchedBytes
Router(config-bulk-objects)# add CcarStatFilteredBytes
Router(config-bulk-objects)# exit
```

Schema Definition Configuration

For the following bulk statistics schema configuration, two schemas are defined for each interface—one for the IF-MIB object instances and one for the CAR-MIB object instances.

```
! ATM IF-MIB schema
Router(config)# snmp mib bulkstat schema ATM2/0-IFMIB
! The following command points to the IF-MIB object list, defined above.
Router(config-bulk-sc)# object-list ifmib
Router(config-bulk-sc)# poll-interval 5
Router(config-bulk-sc)# instance exact interface ATM2/0 subif
Router(config-bulk-sc)# exit
! ATM CAR-MIB schema
Router(config)# snmp mib bulkstat schema-def ATM2/0-CAR
Router(config-bulk-sc)# object-list CAR-mib
Router(config-bulk-sc)# poll-interval 5
Router(config-bulk-sc)# instance wildcard interface ATM2/0 subif
Router(config-bulk-sc)# exit
!Ethernet IF-MIB schema
Router(config)# snmp mib bulkstat schema Ethernet2/1-IFMIB
Router(config-bulk-sc)# object-list ifmib
Router(config-bulk-sc)# poll-interval 5
Router(config-bulk-sc)# instance exact interface Ethernet2/1
Router(config-bulk-sc)# exit

! Ethernet CAR-MIB schema
Router(config)# snmp mib bulkstat schema Ethernet2/1-CAR
Router(config-bulk-sc)# object-list CAR-mib
Router(config-bulk-sc)# poll-interval 5
! Note: ifindex of Ethernet2/1 is 3
```

```
Router(config-bulk-sc)# instance wildcard oid 3.1
Router(config-bulk-sc)# exit
```

Transfer Parameter Configuration

For the transfer of the bulk statistics file, the transfer configuration is given the name bulkstat1. All of the four schema definitions are included in the following transfer configuration.

```
Router(config)# snmp mib bulkstat transfer bulkstat1
Router(config-bulk-tr)# schema ATM2/0-IFMIB
Router(config-bulk-tr)# schema ATM2/0-CAR
Router(config-bulk-tr)# schema Ethernet2/1-IFMIB
Router(config-bulk-tr)# schema Ethernet2/1-CAR
Router(config-bulk-tr)# url primary
ftp://username1:pswrd@cbin2-host/users/username1/bulkstat1
Router(config-bulk-tr)# url secondary
tftp://username1@10.1.0.1/tftpboot/username1/bulkstat1
Router(config-bulk-tr)# format schemaASCII
Router(config-bulk-tr)# transfer-interval 30
Router(config-bulk-tr)# retry 5
Router(config-bulk-tr)# buffer-size 1024
Router(config-bulk-tr)# retain 30
Router(config-bulk-tr)# end
Router# copy running-config startup-config
```

Displaying Status

The following sample output for the **show snmp mib bulkstat transfer** command shows that the initial transfer attempt and the first retry has failed for the newest file, and four additional retry attempts will be made:

```
Router# show snmp mib bulkstat transfer
Transfer Name : bulkstat1

Primary URL ftp://user:XXXXXXXX@192.168.200.162/
Secondary ftp://user:XXXXXXXX@192.168.200.163/

      Retained files

      File Name              : Time Left (in seconds)     : STATE
     ------------------------------------------------------------------------
      bulkstat1_Router_030307_102519739: 1196         :Retry(4 Retry attempt(s) Left)
      bulkstat1_Router_030307_102219739: 1016         :Retained
      bulkstat1_Router_030307_101919739:  836         :Retained
```

The filename for the bulk statistics file is generated with the following extensions to the name you specify in the **url** command:

specified-filename_device-name_date_time-stamp

The device name is the name of the sending device, as specified in the CLI prompt.

The time-stamp format will depend on your system configuration. Typically, the format for the date is YYYYMMDD or YYMMDD. The time stamp uses a 24-hour clock notation, and the format is HHMMSSmmm (where mmm are milliseconds).

In the example above, the files were created on March 7, 2003, at 10:25 a.m., 10:22 a.m., and 10:19 a.m.

Bulk Statistics Output File

The following is sample output as it appears in the bulk statistics file received at the transfer destination. In this output, the name of the bulk statistics file is bulkstat1_Router_20030131_193354234. Also, note that the schema definition (Schema-def) for the schema Ethernet2/1-IFMIB was added to the file as the configuration was changed (see comment lines indicated by "!").

```
Schema-def  ATM2/0-IFMIB "%u, %s,  %u, %u, %u, %u"
epochtime ifDescr instanceoid ifInOctets ifOutOctets ifInUcastPkts ifInDiscards
Schema-def  ATM2/0-CAR  "%u, %s,  %s, %u, %u, %u, %u "
epochtime ifDescr instanceoid CcarStatSwitchedPkts  ccarStatSwitchedBytes
CcarStatSwitchedPkts  ccarStatSwitchedBytes
Schema-def  Ethernet2/1-IFMIB "%u, %u,  %u, %u, %u, %u"
epochtime ifDescr instanceoid ifInOctets ifOutOctets ifInUcastPkts ifInDiscards
Schema-def  Ethernet2/1-CAR  "%u, %s, %u, %u, %u, %u "
Epochtime instanceoid CcarStatSwitchedPkts  ccarStatSwitchedBytes CcarStatSwitchedPkts
ccarStatSwitchedBytes
Schema-def GLOBAL "%s, %s,  %s, %u, %u, %u, %u"
            hostname data timeofday sysuptime cpu5min cpu1min cpu5sec

ATM2/0-IFMIB: 954417080, ATM2/0, 2, 95678, 23456, 234, 3456
ATM2/0-IFMIB: 954417080, ATM2/0.1, 8, 95458, 54356, 245, 454
ATM2/0-IFMIB: 954417080, ATM2/0.2, 9, 45678, 8756, 934, 36756
ATM2/0-CAR: 954417083, ATM2/0, 2.1.1, 234, 345, 123, 124
ATM2/0-CAR: 954417083, ATM2/0, 2.2.1, 452, 67, 132, 145
ATM2/0-CAR: 954417083, ATM2/0.1, 8.1.1, 224, 765, 324 234
ATM2/0-CAR: 954417083, ATM2/0.1, 8.2.1, 234, 345, 123, 124
ATM2/0-CAR: 954417083, ATM2/0.2, 9.1.1, 234, 345, 123, 124
ATM2/0-CAR: 954417083, ATM2/0.2, 9.2.1, 452, 67, 132, 145
Ethernet2/1-IFMIB: 954417090, Ethernet2/1, 3, 45678, 8756, 934, 36756
Ethernet2/1-CAR: 954417093, 3.1.1, 234, 345, 123, 124
Ethernet2/1-CAR: 954417093, 3.1.2, 134, 475, 155, 187
ATM2/0-IFMIB: 954417100, ATM2/0, 2, 95678, 23456, 234, 3456
ATM2/0-IFMIB: 954417101, ATM2/0.1, 8, 95458, 54356, 245, 454
ATM2/0-IFMIB: 954417102, ATM2/0.2, 9, 45678, 8756, 934, 36756
ATM2/0-CAR: 954417106, ATM2/0, 2.1.1, 234, 345, 123, 124
ATM2/0-CAR: 954417107, ATM2/0, 2.2.1, 452, 67, 132, 145
ATM2/0-CAR: 954417107, ATM2/0.1, 8.1.1, 224, 765, 324 234
ATM2/0-CAR: 954417108, ATM2/0.1, 8.2.1, 234, 345, 123, 124
ATM2/0-CAR: 954417113, ATM2/0.2, 9.1.1, 234, 345, 123, 124
ATM2/0-CAR: 954417114, ATM2/0.2, 9.2.1, 452, 67, 132, 145
! Here the Schema-def for "Ehternet2/1-IFMIB" was changed on the originating device.
Schema-def  Ethernet2/1-IFMIB "%u, %u,  %u, %u, %u, %u"
! The object ifOutDiscards has been added to the object list for this schema.
epochtime ifDescr instanceoid ifInOctets ifOutOctets ifInUcastPkts ifInDiscards
            ifOutDiscards
! The following data sample reflects the change in the configuration.
Ethernet2/1-IFMIB: 954417090, Ethernet2/1, 3, 45678, 8756, 934, 36756, 123
Ethernet2/1-CAR: 954417093, 3.1.1, 234, 345, 123, 124
Ethernet2/1-CAR: 954417093, 3.1.2, 134, 475, 155, 187
GLOBAL: Govinda, 20020129, 115131, 78337, 783337, 2%, 0%, 62%
```

Additional References

The following sections provide references related to Periodic MIB Data Collection and Transfer Mechanism.

Related Documents

Related Topic	Document Title
SNMP configuration tasks	"Configuring SNMP Support" section in the *Cisco IOS Network Management Configuration Guide,* Release 12.4
SNMP commands: complete command syntax, command mode, command history, defaults, usage guidelines, and examples	• *Cisco IOS Network Management Command Reference,* Release 12.4T • *Cisco IOS Network Management Command Reference,* Release 12.2SB • *Cisco IOS Network Management Command Reference,* Release 12.2SR

MIBs

MIBs	MIBs Link
This feature supports all Cisco implemented MIBs. This feature uses the Cisco Data Collection MIB (CISCO-DATA-COLLECTION-MIB.my) function of reporting errors and statistics during data collection and transfer. The Cisco Data Collection MIB also supports configuring data collection using the CLI, but configuring data collection using SNMP is not currently implemented.	To locate and download MIBs for selected platforms, Cisco IOS releases, and feature sets, use Cisco MIB Locator found at the following URL: http://www.cisco.com/go/mibs

RFCs

RFC	Title
None	—

Technical Assistance

Description	Link
The Cisco Support website provides extensive online resources, including documentation and tools for troubleshooting and resolving technical issues with Cisco products and technologies. To receive security and technical information about your products, you can subscribe to various services, such as the Product Alert Tool (accessed from Field Notices), the Cisco Technical Services Newsletter, and Really Simple Syndication (RSS) Feeds. Access to most tools on the Cisco Support website requires a Cisco.com user ID and password.	http://www.cisco.com/techsupport

Command Reference

This section documents only commands that are new or modified.

- **add (bulkstat object)**
- **buffer-size (bulkstat)**
- **debug snmp bulkstat**
- **enable (bulkstat)**
- **format (bulkstat)**
- **instance (MIB)**
- **object-list**
- **poll-interval**
- **retain**
- **retry (bulkstat)**
- **schema**
- **show snmp mib bulkstat transfer**
- **snmp mib bulkstat object-list**
- **snmp mib bulkstat schema**
- **snmp mib bulkstat transfer**
- **snmp-server enable traps bulkstat**
- **transfer-interval**
- **url (bulkstat)**

add (bulkstat object)

To add a MIB object to a bulk statistics object list, use the **add** command in Bulk Statistics Object List configuration mode. To remove a MIB object from an SNMP bulk statistics object list, use the **no** form of this command.

add {*object-name* | *oid*}

no add {*object-name* | *oid*}

Syntax Description

object-name	Name of the MIB object to add to the list. Only object names from the Interfaces MIB (IF-MIB.my), Cisco Committed Access Rate MIB (CISCO-CAR-MIB.my) and the MPLS Traffic Engineering MIB (MPLS-TE-MIB.my) may be used.
oid	Object ID (OID) of the MIB object to add to the list.Only OIDs from the Interfaces MIB (IF-MIB.my), Cisco Committed Access Rate MIB (CISCO-CAR-MIB.my) and the MPLS Traffic Engineering MIB (MPLS-TE-MIB.my) may be used.

Command Default

No MIB objects are listed in the bulk statistics object list.

Command Modes

Bulk Statistics Object List configuration (config-bulk-objects)

Command History

Release	Modification
12.0(24)S	This command was introduced.
12.3(2)T	This command was integrated into Cisco IOS Release 12.3(2)T.
12.2(25)S	This command was integrated into Cisco IOS Release 12.2(25)S.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.

Usage Guidelines

All the objects in an object -list have to be indexed by the same MIB index, but the objects need not belong to the same MIB table. For example, it is possible to group ifInoctets and an Ether MIB object in the same schema because the containing tables are indexed by the ifIndex (in the IF-MIB).

Object names are available in the relevant MIB modules. For example, the input byte count of an interface is defined in the Interfaces Group MIB (IF-MIB.my) as ifInoctets. Complete MIB modules can be downloaded from Cisco.com at http://www.cisco.com/public/sw-center/netmgmt/cmtk/mibs.shtml.

Examples

In the following example, two bulk statistics object lists are configured: one for IF-MIB objects and one for CISCO-CAR-MIB objects. Because the IF-MIB objects and the CISCO-CAR-MIB objects do not have the same index, they must be defined in separate object lists.

```
Router(config)# snmp mib bulkstat object-list if-Objects
Router(config-bulk-objects)# add ifInoctets
Router(config-bulk-objects)# add ifOutoctets
Router(config-bulk-objects)# add ifInUcastPkts
Router(config-bulk-objects)# add ifInDiscards
Router(config-bulk-objects)# exit
Router(config)# snmp mib bulkstat object-list CAR-Objects
Router(config-bulk-objects)# add CcarStatSwitchedPkts
Router(config-bulk-objects)# add ccarStatSwitchedBytes
Router(config-bulk-objects)# add CcarStatFilteredBytes
Router(config-bulk-objects)# exit
Router(config)#
```

Related Commands

Command	Description
snmp mib bulkstat object-list	Names a bulk statistics object list and enters Bulk Statistics Object List configuration mode.

buffer-size (bulkstat)

To configure a maximum buffer size for the transfer of bulk statistics files, use the **buffer-size** command in Bulk Statistics Transfer configuration mode. To remove a previously configured buffer size from the configuration, use the **no** form of this command.

buffer-size *bytes*

no buffer-size *bytes*

Syntax Description

bytes	Size of the bulk statistics transfer buffer, in bytes. The valid range is from 1024 to 2147483647. The default is 2048.

Command Default

The default bulk statistics transfer buffer is 2048 bytes.

Command Modes

Bulk Statistics Transfer configuration (config-bulk-tr)

Command History

Release	Modification
12.0(24)S	This command was introduced.
12.3(2)T	This command was integrated into Cisco IOS Release 12.3(2)T.
12.2(25)S	This command was integrated into Cisco IOS Release 12.2(25)S.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.

Usage Guidelines

A configured buffer size limit is available primarily as a safety feature. Normal bulk statistics files should not generally meet or exceed the default value while being transferred.

Examples

In the following example, the bulk statistics transfer buffer size is set to 3072 bytes:

```
Router(config)# snmp mib bulkstat transfer bulkstat1
Router(config-bulk-tr)# schema ATM2/0-IFMIB
Router(config-bulk-tr)# url primary ftp://user:pswrd@host/folder/bulkstat1
Router(config-bulk-tr)# buffer-size 3072
Router(config-bulk-tr)# enable
Router(config-bulk-tr)# exit
Router(config)#
```

Related Commands

Command	Description
snmp mib bulkstat transfer	Identifies the transfer configuration with a name and enters Bulk Statistics Transfer configuration mode.

debug snmp bulkstat

To enable debugging messages for the SNMP Bulk Statistics feature, use the **debug snmp bulkstat** command in privileged EXEC mode. To disable debugging messages for this feature, use the **no** form of this command.

debug snmp bulkstat

no debug snmp bulkstat

Syntax Description

This command has no arguments or keywords.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.0(24)S	This command was introduced.
12.3(2)T	This command was integrated into Cisco IOS Release 12.3(2)T.
12.2(25)S	This command was integrated into Cisco IOS Release 12.2(25)S.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.

Usage Guidelines

This command is intended primarily for Cisco support personnel. Debugging output for the Periodic MIB Data Collection and Transfer Mechanism (Bulk Statistics feature) includes messages for data collection, local file generation, and transfer attempts.

Examples

In the following example, debugging command output is enabled for the Periodic MIB Data Collection and Transfer Mechanism (Bulk Statistics feature). Note that the references to a VFile indicate a local bulk statistics file, usually followed by the filename. The filename uses the format *specified-filename_device-name_date_time-stamp*.

```
Router# debug snmp bulkstat

00:17:38:BULKSTAT-DC:Poll timer fired for ifmib
00:17:38:BULKSTAT-DC:In pollDataGroup
00:17:38:BULKSTAT-DC:creating new file
vfile:IfMIB_objects_ios108_030307_101119739
00:17:38:BULKSTAT-DC:Too small state buffer for ifmib
102
00:17:38:BULKSTAT-DC:Increased buffer state to 1024
00:17:38:BULKSTAT-DC:Interface type data group
00:17:38:BULKSTAT-DC:polling done
00:18:38:BULKSTAT-DC:Poll timer fired for ifmib
00:18:38:BULKSTAT-DC:In pollDataGroup
00:18:38:BULKSTAT-DC:Interface type data group
00:18:38:BULKSTAT-DC:polling done
00:19:26:
BULKSTAT-DC:Collection timer fired for IfMIB_objects
```

```
00:19:26:BULKSTAT-TP:Transfer request for
vfile:IfMIB_objects_ios108_030307_101119739
00:19:30:BULKSTAT-TP:written vfile
IfMIB_objects_ios108_030307_101119739
00:19:30:BULKSTAT-TP:retained vfile
vfile:IfMIB_objects_ios108_030307_101119739
00:19:38:BULKSTAT-DC:Poll timer fired for ifmib
00:19:38:BULKSTAT-DC:In pollDataGroup
00:19:38:BULKSTAT-DC:creating new file
vfile:IfMIB_objects_ios108_030307_101319739
00:19:38:BULKSTAT-DC:Interface type data group
00:19:38:BULKSTAT-DC:polling done
00:20:38:BULKSTAT-DC:Poll timer fired for ifmib
00:20:38:BULKSTAT-DC:In pollDataGroup
00:20:38:BULKSTAT-DC:Interface type data group
00:20:38:BULKSTAT-DC:polling done
00:21:38:BULKSTAT-DC:Poll timer fired for ifmib
00:21:38:BULKSTAT-DC:In pollDataGroup
00:21:38:BULKSTAT-DC:Interface type data group
00:21:38:BULKSTAT-DC:polling done
00:22:26:
BULKSTAT-DC:Collection timer fired for IfMIB_objects
00:22:26:BULKSTAT-TP:Transfer request for
vfile:IfMIB_objects_ios108_030307_101319739
00:22:26:BULKSTAT-TP:written vfile
IfMIB_objects_ios108_030307_101319739
00:22:26:BULKSTAT-TP:retained vfile
vfile:IfMIB_objects_ios108_030307_101319739
00:22:38:BULKSTAT-DC:Poll timer fired for ifmib
00:22:38:BULKSTAT-DC:In pollDataGroup
00:22:38:BULKSTAT-DC:creating new file
vfile:IfMIB_objects_ios108_030307_101619739
00:22:38:BULKSTAT-DC:Interface type data group
00:22:38:BULKSTAT-DC:polling done
00:23:38:BULKSTAT-DC:Poll timer fired for ifmib
00:23:38:BULKSTAT-DC:In pollDataGroup
00:23:38:BULKSTAT-DC:Interface type data group
00:23:38:BULKSTAT-DC:polling done
00:24:38:BULKSTAT-DC:Poll timer fired for ifmib
00:24:38:BULKSTAT-DC:In pollDataGroup
00:24:38:BULKSTAT-DC:Interface type data group
00:24:38:BULKSTAT-DC:polling done
00:25:26:
BULKSTAT-DC:Collection timer fired for IfMIB_objects
00:25:26:BULKSTAT-TP:Transfer request for
vfile:IfMIB_objects_ios108_030307_101619739
00:25:26:BULKSTAT-TP:written vfile
IfMIB_objects_ios108_030307_101619739
00:25:26:BULKSTAT-TP:retained vfile
vfile:IfMIB_objects_ios108_030307_101619739
00:25:38:BULKSTAT-DC:Poll timer fired for ifmib
00:25:38:BULKSTAT-DC:In pollDataGroup
00:25:38:BULKSTAT-DC:creating new file
vfile:IfMIB_objects_ios108_030307_101919739
00:25:38:BULKSTAT-DC:Interface type data group
00:25:38:BULKSTAT-DC:polling done
00:26:38:BULKSTAT-DC:Poll timer fired for ifmib
00:26:38:BULKSTAT-DC:In pollDataGroup
00:26:38:BULKSTAT-DC:Interface type data group
00:26:38:BULKSTAT-DC:polling done
```

Related Commands

Command	Description
show snmp mib bulkstat transfer	Displays the transfer status of files generated by the Periodic MIB Data Collection and Transfer Mechanism.
snmp mib bulkstat transfer	Names a bulk statistics transfer configuration and enters Bulk Statistics Transfer configuration mode.

enable (bulkstat)

To begin the bulk statistics data collection and transfer process for a specific bulk statistics configuration, use the **enable** command in Bulk Statistics Transfer configuration mode. To disable the bulk statistics data collection and transfer process for a specific bulk statistics configuration, use the **no** form of this command.

enable

no enable

Syntax Description

This command has no arguments or keywords.

Command Default

Bulk statistics transfer is disabled.

Command Modes

Bulk Statistics Transfer configuration (config-bulk-tr)

Command History

Release	Modification
12.0(24)S	This command was introduced.
12.3(2)T	This command was integrated into Cisco IOS Release 12.3(2)T.
12.2(25)S	This command was integrated into Cisco IOS Release 12.2(25)S.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.

Usage Guidelines

Specific bulk statistics configurations are identified with a name, as specified in the **snmp mib bulkstat transfer** command. The **enable** command (in Bulk Statistics Transfer configuration mode) begins the periodic MIB data collection and transfer process.

Collection (and subsequent file transfer) will start only if this command is used. Conversely, the **no enable** command will stop the collection process. Subsequently, issuing the **enable** command will start the operations again.

Each time the collection process is started using the **enable** command, data is collected into a new bulk statistics file. When the **no enable** command is used, the transfer process for any collected data will immediately begin (in other words, the existing bulk statistics file will be transferred to the specified management station).

To successfully enable a bulk statistics configuration, at least one schema with a non-zero number of objects must be configured.

Examples

The following example shows the bulk statistics transfer configuration named bulkstat1 as enabled:

```
Router(config)# snmp mib bulkstat transfer bulkstat1
Router(config-bulk-tr)# schema ATM2/0-IFMIB
Router(config-bulk-tr)# url primary ftp://user:pswrd@host/folder/bulkstat1
```

```
Router(config-bulk-tr)# enable
Router(config-bulk-tr)# exit
```

Related Commands

Command	Description
snmp mib bulkstat transfer	Names a bulk statistics transfer configuration and enters Bulk Statistics Transfer configuration mode.

format (bulkstat)

To specify the format to be used for the bulk statistics data file, use the **format** command in Bulk Statistics Transfer configuration mode. To disable a previously configured format specification and return to the default, use the **no** form of this command.

format {**bulkBinary** | **bulkASCII** | **schemaASCII**}

no format {**bulkBinary** | **bulkASCII** | **schemaASCII**}

Syntax Description

bulkBinary	Binary format.
bulkASCII	ASCII (human-readable) format.
schemaASCII	ASCII format with additional bulk statistics schema tags. This is the default.

Command Default

The default bulk statistics transfer format is SchemaASCII.

Command Modes

Bulk Statistics Transfer configuration (config-bulk-tr)

Command History

Release	Modification
12.0(24)S	This command was introduced.
12.3(2)T	This command was integrated into Cisco IOS Release 12.3(2)T.
12.2(25)S	This command was integrated into Cisco IOS Release 12.2(25)S.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.

Usage Guidelines

Note In Cisco IOS Release 12.0(24)S, only the SchemaASCII format is supported. This command will not change the file format in that release.

The bulk statistics data file (VFile) contains two types of fields: tags and data. Tags are used to set off data to distinguish fields of the file. All other information is in data fields.

For the BulkASCII and BulkBinary formats, periodic polling enables data for a single data group (object list) to be collected more than once in the same VFile. Each such instance of a data group can be treated as a different “table” type.

Every object and table tag contains an additional sysUpTime field. Similarly each row tag contains the value of the sysUpTime when the data for that row was collected. The sysUpTime provides a time stamp for the data.

For additional information about the structures of the bulk statistics data file formats, see the definitions in the CISCO-DATA-COLLECTION-MIB.

Examples

In the following example, the bulk statistics data file is set to SchemaASCII:

```
Router(config)# snmp mib bulkstat transfer bulkstat1
Router(config-bulk-tr)# schema ATM2/0-IFMIB
Router(config-bulk-tr)# url primary ftp://user:pswrd@host/folder/bulkstat1
Router(config-bulk-tr)# format schemaASCII
Router(config-bulk-tr)# exit
```

Related Commands

Command	Description
snmp mib bulkstat transfer	Names a bulk statistics transfer configuration and enters Bulk Statistics Transfer configuration mode.

instance (MIB)

To configure the MIB object instances to be used in a bulk statistics schema, use the **instance** command in Bulk Statistics Schema configuration mode. To remove a Simple Network Management Protocol (SNMP) bulk statistics object list, use the **no** form of this command.

instance {**exact** | **wild**} {**interface** *interface-id* [**sub-if**] | **controller** *controller-id* [**sub-if**] | **oid** *oid*}

no instance {**exact** | **wild**} {**interface** *interface-id* [**sub-if**] | **controller** *controller-id* [**sub-if**] | **oid** *oid*}

Syntax Description

exact	Indicates that the specified instance (interface, controller, or object identifier [OID]), when appended to the object list, is the complete OID to be used in this schema.
wild	Indicates that all instances that fall within the specified interface, controller, or OID range should be included in this schema.
interface	Specifies a specific interface or group of interfaces for the schema.
interface-id	Identifies the specific interface or group of interfaces.
sub-if	(Optional) Specifies that the object instances should be polled for all subinterfaces of the specified interface or controller in addition to the object instances for the main interface.
controller	Indicates that a controller or group of controllers is specified for the schema.
controller-id	Identifies the specific controller or group of controllers.
oid	Indicates that an OID is specified.
oid	OID that, when appended to the object list, specifies the complete (or wildcarded) OID for the objects to be monitored.

Command Default

If the **sub-if** keyword is not used, the subinterfaces of the interface or controller will not be polled.

Command Modes

Bulk Statistics Schema configuration (config-bulk-sc)

Command History

Release	Modification
12.0(24)S	This command was introduced.
12.3(2)T	This command was integrated into Cisco IOS Release 12.3(2)T.
12.2(25)S	This command was integrated into Cisco IOS Release 12.2(25)S.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.

Usage Guidelines

The **instance** command specifies the instance information for objects in the schema being configured. The specific instances of MIB objects for which data should be collected are determined by appending the value of the **instance** command to the objects specified in the associated object list. In other words, the schema **object-list** when combined with the schema **instance** specifies a complete MIB object identifier.

The **instance exact** command indicates that the specified instance, when appended to the object list, is the complete OID.

The **instance wild** command indicates that all subindices of the specified OID belong to this schema. In other words, the **wild** keyword allows you to specify a partial, wildcarded instance.

Instead of specifying an OID, you can specify a specific interface. The **interface** *interface-id* keyword and argument allow you to specify an interface name and number (for example, Ethernet 0) instead of specifying the ifIndex OID for the interface. Similarly, the **controller** *controller-id* syntax allows you to specify a controller interface.

The optional **sub-if** keyword, when added after specifying an interface or controller, includes the ifIndexes for all subinterfaces of the interface you specified.

Only one **instance** command can be configured per schema.

Examples

In the following example, the user configures the router to collect bulk statistics for the ifInOctets object (from the IF-MIB) for the Ethernet interface 3/0. In this example, 3 is the ifIndex instance for interface Ethernet3/0. The instance (3) when combined with the object list (ifIndex; 1.3.6.1.2.1.2.2.1.1) translates to the OID 1.3.6.1.2.1.2.2.1.1.3.

```
Router# configure terminal
Router(config)# snmp mib bulkstat object-list E0InOctets
! The following command specifies the object 1.3.6.1.2.1.2.2.1.1.3 (ifIndex)
Router(config-bulk-objects)# add ifIndex
Router(config-bulk-objects)# exit
Router(config)# snmp mib bulkstat schema E0
Router(config-bulk-sc)# object-list E0InOctets
! The following command is equivalent to "instance exact oid 3".
Router(config-bulk-sc)# instance exact interface Ethernet 3/0
Router(config-bulk-sc)# exit
Router(config)# snmp mib bulkstat transfer bulkstat1
Router(config-bulk-tr)# schema E0
Router(config-bulk-tr)# url primary ftp://user:password@host/ftp/user/bulkstat1
Router(config-bulk-tr)# url secondary tftp://user@host/tftp/user/bulkstat1
Router(config-bulk-tr)# format schemaASCII
Router(config-bulk-tr)# transfer-interval 30
Router(config-bulk-tr)# retry 5
Router(config-bulk-tr)# enable
Router(config-bulk-tr)# exit
Router(config)# do copy running-config startup-config
```

Related Commands

Command	Description
object-list	Configures the bulk statistics object list to be used in the bulk statistics schema.
snmp mib bulkstat schema	Names an SNMP bulk statistics schema and enters Bulk Statistics Schema configuration mode.

object-list

To specify the bulk statistics object list to be used in the bulk statistics schema, use the **object-list** command in Bulk Statistics Schema configuration mode. To remove an object list from the schema, use the **no** form of this command.

object-list *list-name*

no object-list *list-name*

Syntax Description

list-name	Name of a previously configured bulk statistics object list.

Command Default

No bulk statistics object list is specified.

Command Modes

Bulk Statistics Schema configuration (config-bulk-sc)

Command History

Release	Modification
12.0(24)S	This command was introduced.
12.3(2)T	This command was integrated into Cisco IOS Release 12.3(2)T.
12.2(25)S	This command was integrated into Cisco IOS Release 12.2(25)S.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.

Usage Guidelines

This command associates a bulk statistics object list with the schema being configured. The object list should contain a list of MIB objects to be monitored.

Only one object list can be specified for each schema.

Examples

In the following example, the object list named E0InOctets is associated with the schema named E0:

```
Router(config)# snmp mib bulkstat schema E0
Router(config-bulk-sc)# object-list EOInOctets
Router(config-bulk-sc)# instance exact interface Ethernet 3/0
Router(config-bulk-sc)# exit
```

Related Commands

Command	Description
instance	Specifies the instance that, when appended to the object list, gives the OID of the object instance to be monitored in the bulk statistics schema.
snmp mib bulkstat schema	Names a bulk statistics schema and enters Bulk Statistics Schema configuration mode.

poll-interval

To configure the polling interval for a bulk statistics schema, use the **poll-interval** command in Bulk Statistics Schema configuration mode. To remove a previously configured polling interval, use the **no** form of this command.

poll-interval *minutes*

no poll-interval *minutes*

Syntax Description

minutes	Integer in the range from 1 to 20000 that specifies, in minutes, the polling interval of data for this schema. The default is 5.

Command Default

Object instances are polled once every five minutes.

Command Modes

Bulk Statistics Schema configuration (config-bulk-sc)

Command History

Release	Modification
12.0(24)S	This command was introduced.
12.3(2)T	This command was integrated into Cisco IOS Release 12.3(2)T.
12.2(25)S	This command was integrated into Cisco IOS Release 12.2(25)S.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.

Usage Guidelines

The **poll-interval** command sets how often the MIB instances specified by the schema and associated object list are to be polled. Collected data is stored in the local bulk statistics file for later transfer.

Examples

In the following example the polling interval for bulk statistics collection is set to once every 3 minutes in the schema called Ethernet2/1-CAR:

```
Router(config)# snmp mib bulkstat schema Ethernet2/1-CAR
Router(config-bulk-sc)# object-list CAR-mib
Router(config-bulk-sc)# poll-interval 3
Router(config-bulk-sc)# instance wildcard oid 3.1
Router(config-bulk-sc)# exit
```

Related Commands

Command	Description
snmp mib bulkstat schema	Names a bulk statistics schema and enters Bulk Statistics Schema configuration mode.

retain

To configure the retention interval for bulk statistics files, use the **retain** command in Bulk Statistics Transfer configuration mode. To remove a previously configured retention interval from the configuration, use the **no** form of this command.

retain *minutes*

no retain *minutes*

Syntax Description

minutes	Length of time, in minutes, that the local bulk statistics file should be kept in system memory (the retention interval). The valid range is 0 to 20000. The default is 0.

Command Default

The bulk statistics file retention interval is 0 minutes.

Command Modes

Bulk Statistics Transfer configuration (config-bulk-tr)

Command History

Release	Modification
12.0(24)S	This command was introduced.
12.3(2)T	This command was integrated into Cisco IOS Release 12.3(2)T.
12.2(25)S	This command was integrated into Cisco IOS Release 12.2(25)S.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.

Usage Guidelines

This command specifies how long the bulk statistics file should be kept in system memory, in minutes, after the completion of the collection interval and a transmission attempt is made. The default value of zero (0) indicates that the file will be deleted immediately from local memory after a successful transfer.

If the **retry** command is used, you should configure a retention interval greater than 0. The interval between retries is the retention interval divided by the retry number. For example, if **retain 10** and **retry 2** are configured, retries will be attempted once every 5 minutes. Therefore, if the **retain** command is not configured (retain default is 0), no retries will be attempted.

Examples

In the following example, the bulk statistics transfer retention interval is set to 10 minutes:

```
Router(config)# snmp mib bulkstat transfer bulkstat1
Router(config-bulk-tr)# schema ATM2/0-IFMIB
Router(config-bulk-tr)# url primary ftp://user:pswrd@host/folder/bulkstat1
Router(config-bulk-tr)# retry 2
Router(config-bulk-tr)# retain 10
Router(config-bulk-tr)# exit
```

Related Commands

Command	Description
retry	Configures the number of retries that should be attempted for sending bulk statistics files.
snmp mib bulkstat transfer	Identifies the transfer configuration with a name and enters Bulk Statistics Transfer configuration mode.

retry (bulkstat)

To configure the number of retries that should be attempted for a bulk statistics file transfer, use the **retry** command in Bulk Statistics Transfer configuration mode. To return the number of bulk statistics retries to the default, use the **no** form of this command.

retry *number*

no retry *number*

Syntax Description

number	Number of transmission retries. The valid range is from 0 to 100.

Command Default

No retry attempts are made.

Command Modes

Bulk Statistics Transfer configuration (config-bulk-tr)

Command History

Release	Modification
12.0(24)S	This command was introduced.
12.3(2)T	This command was integrated into Cisco IOS Release 12.3(2)T.
12.2(25)S	This command was integrated into Cisco IOS Release 12.2(25)S.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.

Usage Guidelines

If an attempt to send the bulk statistics file fails, the system can be configured to attempt to send the file again using the **retry** command. One retry includes an attempt first to the primary destination and then, if the transmission fails, to the secondary location; for example, if the retry value is 1, an attempt will be made first to the primary URL, then to the secondary URL, then to the primary URL again, and then to the secondary URL again.

If the **retry** command is used, you should also use the **retain** command to configure a retention interval greater than 0. The interval between retries is the retention interval divided by the retry number. For example, if **retain 10** and **retry 2** are configured, retries will be attempted once every 5 minutes. Therefore, if the **retain** command is not configured (or the **retain 0** command is used) no retries will be attempted.

Examples

In the following example, the number of retries for the bulk statistics transfer is set to 2:

```
Router(config)# snmp mib bulkstat transfer bulkstat1
Router(config-bulk-tr)# schema ATM2/0-IFMIB
Router(config-bulk-tr)# url primary ftp://user:pswrd@host/folder/bulkstat1
Router(config-bulk-tr)# retry 2
Router(config-bulk-tr)# retain 10
Router(config-bulk-tr)# exit
```

Related Commands

Command	Description
retain	Configures the retention interval in local system memory (NVRAM) for bulk statistics files.
snmp mib bulkstat transfer	Identifies the transfer configuration with a name and enters Bulk Statistics Transfer configuration mode.

schema

To specify the bulk statistics schema to be used in a specific bulk statistics transfer configuration, use the **schema** command in Bulk Statistics Transfer configuration mode. To remove a previously configured schema from a specific bulk statistics transfer configuration, use the **no** form of this command.

schema *schema-name*

no schema *schema-name*

Syntax Description

schema-name	Name of a previously configured bulk statistics schema.

Command Default

No bulk statistics schema is specified.

Command Modes

Bulk Statistics Transfer configuration (config-bulk-tr)

Command History

Release	Modification
12.0(24)S	This command was introduced.
12.3(2)T	This command was integrated into Cisco IOS Release 12.3(2)T.
12.2(25)S	This command was integrated into Cisco IOS Release 12.2(25)S.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.

Usage Guidelines

Repeat this command as desired for a specific bulk statistics transfer configuration. Multiple schemas can be associated with a single transfer configuration; all collected data will be in a single bulk statistics data file (VFile).

Examples

In the following example, the bulk statistics schemas ATM2/0-IFMIB and ATM2/0-CAR are associated with the bulk statistics transfer configuration called bulkstat1:

```
Router(config)# snmp mib bulkstat transfer bulkstat1
Router(config-bulk-tr)# schema ATM2/0-IFMIB
Router(config-bulk-tr)# schema ATM2/0-CAR
Router(config-bulk-tr)# url primary ftp://user:pswrd@host/folder/bulkstat1
Router(config-bulk-tr)# retry 2
Router(config-bulk-tr)# retain 10
Router(config-bulk-tr)# exit
```

Related Commands

Command	Description
snmp mib bulkstat transfer	Names a bulk statistics transfer configuration and enters Bulk Statistics Transfer configuration mode.

show snmp mib bulkstat transfer

To display the transfer status of files generated by the Periodic MIB Data Collection and Transfer Mechanism (Bulk Statistics feature), use the **show snmp mib bulkstat transfer** command in privileged EXEC mode.

show snmp mib bulkstat transfer [*transfer-id*]

Syntax Description

transfer-id	(Optional) Name of a specific bulk statistics transfer configuration. Use the *transfer-id* argument to display the status of a specific bulk statistics transfer configuration.

Command Default

If the optional *transfer-id* argument is not used, the status of all configured bulk statistics transfers is displayed.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.0(24)S	This command was introduced.
12.3(2)T	This command was integrated into Cisco IOS Release 12.3(2)T.
12.2(25)S	This command was integrated into Cisco IOS Release 12.2(25)S.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.

Examples

In the following example, the initial transfer attempt and the first retry for the file IfMIB_objects_Router_030307_102519739 to the primary and secondary URL have failed, and four additional retry attempts will be made. The time stamp for this file indicates the file was created on March 7, 2003, at 10:25:19 a.m.

```
Router# show snmp mib bulkstat transfer

Transfer Name : IfMIB_objects

Primary URL ftp://user:XXXXXXXX@192.168.1.229/
Secondary ftp://user:XXXXXXXX@192.168.1.230/

   Retained files

   File Name                          :Time Left (in seconds)     : STATE
   ------------------------------------------------------------------------
   IfMIB_objects_Router_030307_102519739 :  1196   :Retry(5 Retry attempt(s) Left)
   IfMIB_objects_Router_030307_102219739 :  1016   :Retained
   IfMIB_objects_Router_030307_101919739 :   836   :Retained
   IfMIB_objects_Router_030307_101619739 :   656   :Retained
   IfMIB_objects_Router_030307_101319739 :   475   :Retained
   IfMIB_objects_Router_030307_101119739 :   295   :Retained
```

Table 1 describes the significant fields shown in the output.

Table 1 show snmp mib bulkstat transfer Field Descriptions

Field	Description
Transfer Name	The name of the transfer configuration, specified in the **snmp mib bulkstat transfer** global configuration command.
Retained files	Indicates that the following output shows the status of files that are in system memory (retained), as opposed to files that have already been set.
File Name	The name of the bulk statistics file as it will appear after transfer. The filename of the file is generated using the following components: *transfer-name_device-name_date_time-stamp* The *transfer-name* is the name specified by the corresponding **snmp mib bulkstat transfer** command. The *device-name* is the name used in the command-line interface (CLI) router prompt. The format of the *date* and *time-stamp* depends on your system configuration, but is typically YYMMDD and HHMMSSmmm, where HH is hour, MM is minutes, SS is seconds and mmm is milliseconds.
Time Left (in seconds)	Indicates how much time is left before the specified file will be deleted (retention period), as specified with the **retain** Bulk Statistics Transfer configuration command. **Note** Regardless of the configured retention period, all retry attempts will be made before the file is deleted.
STATE	The state of the local bulk statistics file will be one of the following: • Queued—Collection time for this file is completed and the file is waiting for transfer to configured primary and secondary URL. • Retained—The file has been either successfully transferred to its destination or, if all transfer attempts have failed, all retry attempts have been completed. • Retry—The local bulk statistics file will be in this state if an attempt to transfer it to its configured destination fails and one or more retries are pending. The number of retries left will also be displayed in parenthesis.

Related Commands

Command	Description
snmp mib bulkstat transfer	Names a bulk statistics transfer configuration and enters Bulk Statistics Transfer configuration mode.

snmp mib bulkstat object-list

To configure a Simple Network Management Protocol (SNMP) bulk statistics object list, use the **snmp mib bulkstat object-list** command in global configuration mode. To remove an SNMP bulk statistics object list, use the **no** form of this command.

snmp mib bulkstat object-list *name*

no snmp mib bulkstat object-list *name*

Syntax Description

name	Name of the object list to be configured.

Command Default

No SNMP bulk statistics object list is configured.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.0(24)S	This command was introduced.
12.3(2)T	This command was integrated into Cisco IOS Release 12.3(2)T.
12.2(25)S	This command was integrated into Cisco IOS Release 12.2(25)S.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.

Usage Guidelines

The **snmp mib bulkstat object-list** command allows you to name an object list. Bulk statistics object lists are used for the Periodic MIB Data Collection and Transfer Mechanism.

After you enter this command, the router enters Bulk Statistics Object List configuration mode, in which you can use the **add** command to add specific MIB objects to the list.

Bulk statistics object lists can be reused in multiple schemas.

Examples

In the following example, a bulk statistics object list called ifMib is configured to include the ifInoctets, ifOutoctets, ifInUcastPkts, and ifInDiscards objects from the Interfaces Group MIB (IF-MIB):

```
Router(config)# snmp mib bulkstat object-list ifmib
Router(config-bulk-objects)# add ifInoctets
Router(config-bulk-objects)# add ifOutoctets
Router(config-bulk-objects)# add ifInUcastPkts
Router(config-bulk-objects)# add ifInDiscards
Router(config-bulk-objects)# end
```

Related Commands

Command	Description
add	Adds specific MIB objects to a defined SNMP bulk statistics object list.
snmp mib bulkstat schema	Names an SNMP bulk statistics schema and enters Bulk Statistics Schema configuration mode.

snmp mib bulkstat schema

To define a bulk statistics schema, use the **snmp mib bulkstat schema** command in global configuration mode. To delete a previously configured bulk statistics schema, use the **no** form of this command.

snmp mib bulkstat schema *schema-name*

no snmp mib bulkstat schema *schema-name*

Syntax Description

schema-name	Name of the bulk statistics schema to be configured.

Command Default

No schemas are defined.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.0(24)S	This command was introduced.
12.3(2)T	This command was integrated into Cisco IOS Release 12.3(2)T.
12.2(25)S	This command was integrated into Cisco IOS Release 12.2(25)S.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.

Usage Guidelines

The **snmp mib bulkstat schema** command names the schema and enters Bulk Statistics Schema configuration mode. Bulk Statistics Schema configuration mode is used to configure the object list, instance, and polling interval to be used in the schema.

The specific instances of MIB objects for which data should be collected are determined by appending the value of the **instance** command to the objects specified in the object list.

Multiple schemas can be associated with a single bulk statistics file when configuring the bulk statistics transfer options.

Examples

The following example shows the configuration of a bulk statistics schema called ATM2/0-IFMIB:

```
Router(config)# snmp mib bulkstat schema ATM2/0-IFMIB
Router(config-bulk-sc)# object-list ifmib
Router(config-bulk-sc)# poll-interval 5
Router(config-bulk-sc)# instance exact interface ATM2/0 subif
Router(config-bulk-sc)# exit
```

Related Commands

Command	Description
instance	Specifies the instance that, when appended to the object list, gives the OID of the object instance to be monitored in a bulk statistics schema.
object-list	Adds specific MIB objects to a defined SNMP bulk statistics object list.
poll-interval	Configures the polling interval for a bulk statistics schema.
snmp mib bulkstat transfer	Names a bulk statistics transfer configuration and enters Bulk Statistics Transfer configuration mode.

snmp mib bulkstat transfer

To identify the bulk statistics transfer configuration and enter Bulk Statistics Transfer configuration mode, use the **snmp mib bulkstat transfer** command in global configuration mode. To remove a previously configured transfer, use the **no** form of this command.

snmp mib bulkstat transfer *transfer-id*

no snmp mib bulkstat transfer *transfer-id*

Syntax Description

transfer-id	Name of the transfer configuration.

Command Default

No bulk statistics transfer configuration exists.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.0(24)S	This command was introduced.
12.3(2)T	This command was integrated into Cisco IOS Release 12.3(2)T.
12.2(25)S	This command was integrated into Cisco IOS Release 12.2(25)S.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.

Usage Guidelines

The name (*transfer-id*) you specify for the bulk statistics transfer configuration is used in the filename of the bulk statistics file when it is generated and is used to identify the transfer configuration in the output of the **show snmp mib bulkstat transfer** command.

This command enters Bulk Statistics Transfer configuration mode, as indicated by the prompt (config-bulk-tr).

Examples

In the following example, the transfer configuration is given the name bulkstat1 and is configured to include the schemas ATM2/0-IFMIB and ATM2/0-CAR:

```
Router(config)# snmp mib bulkstat transfer bulkstat1
Router(config-bulk-tr)# schema ATM2/0-IFMIB
Router(config-bulk-tr)# schema ATM2/0-CAR
Router(config-bulk-tr)# url primary ftp://user1:pswrd@cbin2-host/users/user1/bulkstat1
Router(config-bulk-tr)# url secondary tftp://user1@10.1.0.1/tftpboot/user1/bulkstat1
Router(config-bulk-tr)# format schemaASCII
Router(config-bulk-tr)# transfer-interval 30
Router(config-bulk-tr)# retry 5
Router(config-bulk-tr)# buffer-size 1024
Router(config-bulk-tr)# retain 30
Router(config-bulk-tr)# end
Router# copy running-config startup-config
```

Related Commands

Command	Description
show snmp mib bulkstat transfer	Displays the transfer status of files generated by the Periodic MIB Data Collection and Transfer Mechanism.

snmp-server enable traps bulkstat

To enable the sending of Simple Network Management Protocol (SNMP) bulk statistics collection and transfer SNMP notifications, use the **snmp-server enable traps bulkstat** command in global configuration mode. To disable bulk statistics SNMP notifications, use the **no** form of this command.

snmp-server enable traps bulkstat [**collection** | **transfer**]

no snmp-server enable traps bulkstat [**collection** | **transfer**]

Syntax Description

collection	(Optional) Controls bulk statistics collection notifications, which are sent when data collection cannot be carried out successfully. (Defined as cdcVFileCollectionError in the CISCO-DATA-COLLECTION-MIB.)
transfer	(Optional) Controls bulk statistics transfer notifications, which are sent when a transfer attempt is successful or when a transfer attempt fails. (Defined as cdcFileXferComplete in the CISCO-DATA-COLLECTION-MIB. The varbind cdcFilXferStatus object in the trap indicates if the transfer is successful or not.)

Command Default

SNMP notifications are disabled.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.0(24)S	This command was introduced.
12.3(2)T	This command was integrated into Cisco IOS Release 12.3(2)T.
12.2(25)S	This command was integrated into Cisco IOS Release 12.2(25)S.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.

Usage Guidelines

SNMP notifications can be sent as traps or inform requests. The **snmp-server enable traps bulkstat** command enables both traps and inform requests for the specified notification types. Use this command with the **snmp-server host** [**bulkstat**] command.

The optional **collection** keyword controls bulk statistics collection notifications that are sent when data collection cannot be carried out successfully. One possible reason for this condition is insufficient memory on the device.

If the optional keywords are not used, all bulk statistics notification types are enabled (or disabled, if the **no** form of the command is used).

Examples

In the following example, bulk statistics collection and transfer notifications are configured to be sent to the host myhost.cisco.com using the community string public:

```
Router(config)# snmp-server enable traps bulkstat
Router(config)# snmp-server host myhost.cisco.com traps version 2c public bulkstat
```

Related Commands

Command	Description
snmp mib bulkstat transfer	Names a bulk statistics transfer configuration and enters Bulk Statistics Transfer configuration mode.
snmp-server host	Specifies the recipient of an SNMP notification operation.
snmp-server trap-source	Specifies the interface from which an SNMP trap should originate.

transfer-interval

To configure how long bulk statistics should be collected before a bulk statistics transfer is initiated, use the **transfer-interval** command in Bulk Statistics Transfer configuration mode. To remove a previously configured interval from a bulk statistics configuration, use the **no** form of this command.

transfer-interval *minutes*

no transfer-interval *minutes*

Syntax Description

minutes	Length of time, in minutes, that the system should collect MIB data before attempting the transfer operation. The valid range is from 1 to 2147483647. The default is 30.

Command Default

Bulk statistics file transfer operations start 30 minutes after the **enable** (bulkstat) command is used.

Command Modes

Bulk Statistics Transfer configuration (config-bulk-tr)

Command History

Release	Modification
12.0(24)S	This command was introduced.
12.3(2)T	This command was integrated into Cisco IOS Release 12.3(2)T.
12.2(25)S	This command was integrated into Cisco IOS Release 12.2(25)S.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.

Usage Guidelines

Bulk statistics data is collected into a new file when a transfer attempt begins, which means that this command also configures the collection interval.

If the maximum buffer size for a bulk statistics file is reached before the transfer interval time expires, the transfer operation will still be initiated, and bulk statistics MIB data will be collected into a new file in the system buffer.

Examples

The following example shows how to configure a transfer interval of 20 minutes for the bulk statistics configuration bulkstat1:

```
Router(config)# snmp mib bulkstat transfer bulkstat1

Router(config-bulk-tr)# transfer-interval 20
```

Related Commands

Command	Description
snmp mib bulkstat transfer	Names a bulk statistics transfer configuration and enters Bulk Statistics Transfer configuration mode.

url (bulkstat)

To specify the host to which bulk statistics files should be transferred, use the **url** command in Bulk Statistics Transfer configuration mode. To remove a previously configured destination host, use the **no** form of this command.

url {**primary** | **secondary**} *url*

no url {**primary** | **secondary**} *url*

Syntax Description

primary	Specifies the URL to be used first for bulk statistics transfer attempts.
secondary	Specifies the URL to be used for bulk statistics transfer attempts if the transfer to the primary URL is not successful.
url	Destination URL address for the bulk statistics file transfer. Use FTP, RCP, or TFTP. The Cisco IOS File System (IFS) syntax for these URLs is as follows: • **ftp:**[[[*//username* [*:password*]*@*]*location*]*/directory*]*/filename* • **rcp:**[[[*//username@*]*location*]*/directory*]*/filename* • **tftp:**[[*//location*]*/directory*]*/filename* The *location* argument is typically an IP address.

Command Default

No host is specified.

Command Modes

Bulk Statistics Transfer configuration (config-bulk-tr)

Command History

Release	Modification
12.0(24)S	This command was introduced.
12.3(2)T	This command was integrated into Cisco IOS Release 12.3(2)T.
12.2(25)S	This command was integrated into Cisco IOS Release 12.2(25)S.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.

Usage Guidelines

For bulk statistics transfer retry attempts, a single retry consists of an attempt to send first to the primary URL, and then to the secondary URL.

Examples

In the following example, an FTP server is used as the primary destination for the bulk statistics file. If a transfer to that address fails, an attempt is made to send the file to the TFTP server at 192.168.10.5. No retry command is specified, which means that only one attempt to each destination will be made.

```
Router(config)# snmp mib bulkstat transfer ifMibTesting
Router(config-bulk-tr)# schema carMibTesting1
```

```
Router(config-bulk-tr)# schema carMibTesting2
Router(config-bulk-tr)# format bulkBinary
Router(config-bulk-tr)# transfer-interval 60
Router(config-bulk-tr)# buffer-size 10000
Router(config-bulk-tr)# url primary ftp://user2:pswd@192.168.10.5/functionality/
Router(config-bulk-tr)# url secondary tftp://user2@192.168.10.8/tftpboot/
Router(config-bulk-tr)# buffer-size 2500000
Router(config-bulk-tr)# enable
Router(config-bulk-tr)# exit
```

Related Commands

Command	Description
retry (bulkstat)	Configures the number of retries that should be attempted for sending bulk statistics files.
snmp mib bulkstat transfer	Names a bulk statistics transfer configuration and enters Bulk Statistics Transfer configuration mode.

Appendix A: Object Names Supported for the add Command

Table 2 through Table 4 contain the object names that can be used with the **add** command when configuring an object list and their associated OIDs. These object names can be used instead of specifying the OID number.

Table 2 IF-MIB Objects

Object Name	Object Identifier
mib_2	1.3.6.1.2.1
interfaces	1.3.6.1.2.1.2
ifNumber	1.3.6.1.2.1.2.1
ifTable	1.3.6.1.2.1.2.2
ifEntry	1.3.6.1.2.1.2.2.1
ifIndex	1.3.6.1.2.1.2.2.1.1
ifDescr	1.3.6.1.2.1.2.2.1.2
ifType	1.3.6.1.2.1.2.2.1.3
ifMtu	1.3.6.1.2.1.2.2.1.4
ifSpeed	1.3.6.1.2.1.2.2.1.5
ifPhysAddress	1.3.6.1.2.1.2.2.1.6
ifAdminStatus	1.3.6.1.2.1.2.2.1.7
ifOperStatus	1.3.6.1.2.1.2.2.1.8
ifLastChange	1.3.6.1.2.1.2.2.1.9
ifInOctets	1.3.6.1.2.1.2.2.1.10
ifInUcastPkts	1.3.6.1.2.1.2.2.1.11
ifInNUcastPkts	1.3.6.1.2.1.2.2.1.12
ifInDiscards	1.3.6.1.2.1.2.2.1.13
ifInErrors	1.3.6.1.2.1.2.2.1.14
ifInUnknownProtos	1.3.6.1.2.1.2.2.1.15
ifOutOctets	1.3.6.1.2.1.2.2.1.16
ifOutUcastPkts	1.3.6.1.2.1.2.2.1.17
ifOutNUcastPkts	1.3.6.1.2.1.2.2.1.18
ifOutDiscards	1.3.6.1.2.1.2.2.1.19
ifOutErrors	1.3.6.1.2.1.2.2.1.20
ifOutQLen	1.3.6.1.2.1.2.2.1.21
ifSpecific	1.3.6.1.2.1.2.2.1.22
ifMIB	1.3.6.1.2.1.31
ifMIBObjects	1.3.6.1.2.1.31.1
ifXTable	1.3.6.1.2.1.31.1.1
ifXEntry	1.3.6.1.2.1.31.1.1.1

Table 2 IF-MIB Objects (continued)

Object Name	Object Identifier
ifName	1.3.6.1.2.1.31.1.1.1.1
ifInMulticastPkts	1.3.6.1.2.1.31.1.1.1.2
ifInBroadcastPkts	1.3.6.1.2.1.31.1.1.1.3
ifOutMulticastPkts	1.3.6.1.2.1.31.1.1.1.4
ifOutBroadcastPkts	1.3.6.1.2.1.31.1.1.1.5
ifHCInOctets	1.3.6.1.2.1.31.1.1.1.6
ifHCInUcastPkts	1.3.6.1.2.1.31.1.1.1.7
ifHCInMulticastPkts	1.3.6.1.2.1.31.1.1.1.8
ifHCInBroadcastPkts	1.3.6.1.2.1.31.1.1.1.9
ifHCOutOctets	1.3.6.1.2.1.31.1.1.1.10
ifHCOutUcastPkts	1.3.6.1.2.1.31.1.1.1.11
ifHCOutMulticastPkts	1.3.6.1.2.1.31.1.1.1.12
ifHCOutBroadcastPkts	1.3.6.1.2.1.31.1.1.1.13
ifLinkUpDownTrapEnable	1.3.6.1.2.1.31.1.1.1.14
ifHighSpeed	1.3.6.1.2.1.31.1.1.1.15
ifPromiscuousMode	1.3.6.1.2.1.31.1.1.1.16
ifConnectorPresent	1.3.6.1.2.1.31.1.1.1.17
ifAlias	1.3.6.1.2.1.31.1.1.1.18
ifCounterDiscontinuityTime	1.3.6.1.2.1.31.1.1.1.19
ifStackTable	1.3.6.1.2.1.31.1.2
ifStackEntry	1.3.6.1.2.1.31.1.2.1
ifStackHigherLayer	1.3.6.1.2.1.31.1.2.1.1
ifStackLowerLayer	1.3.6.1.2.1.31.1.2.1.2
ifStackStatus	1.3.6.1.2.1.31.1.2.1.3
ifTestTable	1.3.6.1.2.1.31.1.3
ifTestEntry	1.3.6.1.2.1.31.1.3.1
ifTestId	1.3.6.1.2.1.31.1.3.1.1
ifTestStatus	1.3.6.1.2.1.31.1.3.1.2
ifTestType	1.3.6.1.2.1.31.1.3.1.3
ifTestResult	1.3.6.1.2.1.31.1.3.1.4
ifTestCode	1.3.6.1.2.1.31.1.3.1.5
ifTestOwner	1.3.6.1.2.1.31.1.3.1.6
ifRcvAddressTable	1.3.6.1.2.1.31.1.4
ifRcvAddressEntry	1.3.6.1.2.1.31.1.4.1
ifRcvAddressAddress	1.3.6.1.2.1.31.1.4.1.1
ifRcvAddressStatus	1.3.6.1.2.1.31.1.4.1.2

Table 2 IF-MIB Objects (continued)

Object Name	Object Identifier
ifRcvAddressType	1.3.6.1.2.1.31.1.4.1.3
ifTableLastChange	1.3.6.1.2.1.31.1.5
ifStackLastChange	1.3.6.1.2.1.31.1.6
ifConformance	1.3.6.1.2.1.31.2
ifGroups	1.3.6.1.2.1.31.2.1
ifGeneralGroup	1.3.6.1.2.1.31.2.1.1
ifFixedLengthGroup	1.3.6.1.2.1.31.2.1.2
ifHCFixedLengthGroup	1.3.6.1.2.1.31.2.1.3
ifPacketGroup	1.3.6.1.2.1.31.2.1.4
ifHCPacketGroup	1.3.6.1.2.1.31.2.1.5
ifVHCPacketGroup	1.3.6.1.2.1.31.2.1.6
ifRcvAddressGroup	1.3.6.1.2.1.31.2.1.7
ifTestGroup	1.3.6.1.2.1.31.2.1.8
ifStackGroup	1.3.6.1.2.1.31.2.1.9
ifGeneralInformationGroup	1.3.6.1.2.1.31.2.1.10
ifStackGroup2	1.3.6.1.2.1.31.2.1.11
ifOldObjectsGroup	1.3.6.1.2.1.31.2.1.12
ifCounterDiscontinuityGroup	1.3.6.1.2.1.31.2.1.13
ifCompliances	1.3.6.1.2.1.31.2.2
ifCompliance	1.3.6.1.2.1.31.2.2.1
ifCompliance2	1.3.6.1.2.1.31.2.2.2

Table 3 CISCO-CAR-MIB Objects

Object Name	Object Identifier
ciscoCarMIBObjects	1.3.6.1.4.1.9.9.113.1
ccarConfigs	1.3.6.1.4.1.9.9.113.1.1
ccarConfigTable	1.3.6.1.4.1.9.9.113.1.1.1
ccarConfigEntry	1.3.6.1.4.1.9.9.113.1.1.1.1
ccarConfigDirection	1.3.6.1.4.1.9.9.113.1.1.1.1.1
ccarConfigRowIndex	1.3.6.1.4.1.9.9.113.1.1.1.1.2
ccarConfigType	1.3.6.1.4.1.9.9.113.1.1.1.1.3
ccarConfigAccIdx	1.3.6.1.4.1.9.9.113.1.1.1.1.4
ccarConfigRate	1.3.6.1.4.1.9.9.113.1.1.1.1.5
ccarConfigLimit	1.3.6.1.4.1.9.9.113.1.1.1.1.6
ccarConfigExtLimit	1.3.6.1.4.1.9.9.113.1.1.1.1.7

Table 3 CISCO-CAR-MIB Objects (continued)

Object Name	Object Identifier
ccarConfigConformAction	1.3.6.1.4.1.9.9.113.1.1.1.1.8
ccarConfigExceedAction	1.3.6.1.4.1.9.9.113.1.1.1.1.9
ccarStats	1.3.6.1.4.1.9.9.113.1.2
ccarStatTable	1.3.6.1.4.1.9.9.113.1.2.1
ccarStatEntry	1.3.6.1.4.1.9.9.113.1.2.1.1
ccarStatSwitchedPkts	1.3.6.1.4.1.9.9.113.1.2.1.1.1
ccarStatSwitchedBytes	1.3.6.1.4.1.9.9.113.1.2.1.1.2
ccarStatFilteredPkts	1.3.6.1.4.1.9.9.113.1.2.1.1.3
ccarStatFilteredBytes	1.3.6.1.4.1.9.9.113.1.2.1.1.4
ccarStatCurBurst	1.3.6.1.4.1.9.9.113.1.2.1.1.5
ccarStatSwitchedPktsOverflow	1.3.6.1.4.1.9.9.113.1.2.1.1.6
ccarStatSwitchedBytesOverflow	1.3.6.1.4.1.9.9.113.1.2.1.1.7
ccarStatFilteredPktsOverflow	1.3.6.1.4.1.9.9.113.1.2.1.1.8
ccarStatFilteredBytesOverflow	1.3.6.1.4.1.9.9.113.1.2.1.1.9
ccarStatHCSwitchedPkts	1.3.6.1.4.1.9.9.113.1.2.1.1.10
ccarStatHCSwitchedBytes	1.3.6.1.4.1.9.9.113.1.2.1.1.11
ccarStatHCFilteredPkts	1.3.6.1.4.1.9.9.113.1.2.1.1.12
ccarStatHCFilteredBytes	1.3.6.1.4.1.9.9.113.1.2.1.1.13

Table 4 MPLS-TE-MIB Objects

Object Name	Object Identifier
mplsTeMIB	1.3.6.1.3.95
mplsTeScalars	1.3.6.1.3.95.1
mplsTunnelConfigured	1.3.6.1.3.95.1.1
mplsTunnelActive	1.3.6.1.3.95.1.2
mplsTunnelTEDistProto	1.3.6.1.3.95.1.3
mplsTunnelMaxHops	1.3.6.1.3.95.1.4
mplsTeObjects	1.3.6.1.3.95.2
mplsTunnelIndexNext	1.3.6.1.3.95.2.1
mplsTunnelTable	1.3.6.1.3.95.2.2
mplsTunnelEntry	1.3.6.1.3.95.2.2.1
mplsTunnelIndex	1.3.6.1.3.95.2.2.1.1
mplsTunnelInstance	1.3.6.1.3.95.2.2.1.2
mplsTunnelIngressLSRId	1.3.6.1.3.95.2.2.1.3
mplsTunnelEgressLSRId	1.3.6.1.3.95.2.2.1.4

Table 4 MPLS-TE-MIB Objects (continued)

Object Name	Object Identifier
mplsTunnelName	1.3.6.1.3.95.2.2.1.5
mplsTunnelDescr	1.3.6.1.3.95.2.2.1.6
mplsTunnelIsIf	1.3.6.1.3.95.2.2.1.7
mplsTunnelIfIndex	1.3.6.1.3.95.2.2.1.8
mplsTunnelXCPointer	1.3.6.1.3.95.2.2.1.9
mplsTunnelSignallingProto	1.3.6.1.3.95.2.2.1.10
mplsTunnelSetupPrio	1.3.6.1.3.95.2.2.1.11
mplsTunnelHoldingPrio	1.3.6.1.3.95.2.2.1.12
mplsTunnelSessionAttributes	1.3.6.1.3.95.2.2.1.13
mplsTunnelOwner	1.3.6.1.3.95.2.2.1.14
mplsTunnelLocalProtectInUse	1.3.6.1.3.95.2.2.1.15
mplsTunnelResourcePointer	1.3.6.1.3.95.2.2.1.16
mplsTunnelInstancePriority	1.3.6.1.3.95.2.2.1.17
mplsTunnelHopTableIndex	1.3.6.1.3.95.2.2.1.18
mplsTunnelARHopTableIndex	1.3.6.1.3.95.2.2.1.19
mplsTunnelCHopTableIndex	1.3.6.1.3.95.2.2.1.20
mplsTunnelPrimaryInstance	1.3.6.1.3.95.2.2.1.21
mplsTunnelPrimaryTimeUp	1.3.6.1.3.95.2.2.1.22
mplsTunnelPathChanges	1.3.6.1.3.95.2.2.1.23
mplsTunnelLastPathChange	1.3.6.1.3.95.2.2.1.24
mplsTunnelCreationTime	1.3.6.1.3.95.2.2.1.25
mplsTunnelStateTransitions	1.3.6.1.3.95.2.2.1.26
mplsTunnelIncludeAnyAffinity	1.3.6.1.3.95.2.2.1.27
mplsTunnelIncludeAllAffinity	1.3.6.1.3.95.2.2.1.28
mplsTunnelExcludeAllAffinity	1.3.6.1.3.95.2.2.1.29
mplsTunnelPathInUse	1.3.6.1.3.95.2.2.1.30
mplsTunnelRole	1.3.6.1.3.95.2.2.1.31
mplsTunnelTotalUpTime	1.3.6.1.3.95.2.2.1.32
mplsTunnelInstanceUpTime	1.3.6.1.3.95.2.2.1.33
mplsTunnelAdminStatus	1.3.6.1.3.95.2.2.1.34
mplsTunnelOperStatus	1.3.6.1.3.95.2.2.1.35
mplsTunnelRowStatus	1.3.6.1.3.95.2.2.1.36
mplsTunnelStorageType	1.3.6.1.3.95.2.2.1.37
mplsTunnelHopListIndexNext	1.3.6.1.3.95.2.3
mplsTunnelHopTable	1.3.6.1.3.95.2.4
mplsTunnelHopEntry	1.3.6.1.3.95.2.4.1

Table 4 MPLS-TE-MIB Objects (continued)

Object Name	Object Identifier
mplsTunnelHopListIndex	1.3.6.1.3.95.2.4.1.1
mplsPathOptionIndex	1.3.6.1.3.95.2.4.1.2
mplsTunnelHopIndex	1.3.6.1.3.95.2.4.1.3
mplsTunnelHopAddrType	1.3.6.1.3.95.2.4.1.4
mplsTunnelHopIpv4Addr	1.3.6.1.3.95.2.4.1.5
mplsTunnelHopIpv4PrefixLen	1.3.6.1.3.95.2.4.1.6
mplsTunnelHopIpv6Addr	1.3.6.1.3.95.2.4.1.7
mplsTunnelHopIpv6PrefixLen	1.3.6.1.3.95.2.4.1.8
mplsTunnelHopAsNumber	1.3.6.1.3.95.2.4.1.9
mplsTunnelHopLspId	1.3.6.1.3.95.2.4.1.10
mplsTunnelHopType	1.3.6.1.3.95.2.4.1.11
mplsTunnelHopRowStatus	1.3.6.1.3.95.2.4.1.12
mplsTunnelHopStorageType	1.3.6.1.3.95.2.4.1.13
mplsTunnelResourceIndexNext	1.3.6.1.3.95.2.5
mplsTunnelResourceTable	1.3.6.1.3.95.2.6
mplsTunnelResourceEntry	1.3.6.1.3.95.2.6.1
mplsTunnelResourceIndex	1.3.6.1.3.95.2.6.1.1
mplsTunnelResourceMaxRate	1.3.6.1.3.95.2.6.1.2
mplsTunnelResourceMeanRate	1.3.6.1.3.95.2.6.1.3
mplsTunnelResourceMaxBurstSize	1.3.6.1.3.95.2.6.1.4
mplsTunnelResourceRowStatus	1.3.6.1.3.95.2.6.1.5
mplsTunnelResourceStorageType	1.3.6.1.3.95.2.6.1.6
mplsTunnelARHopTable	1.3.6.1.3.95.2.7
mplsTunnelARHopEntry	1.3.6.1.3.95.2.7.1
mplsTunnelARHopListIndex	1.3.6.1.3.95.2.7.1.1
mplsTunnelARHopIndex	1.3.6.1.3.95.2.7.1.2
mplsTunnelARHopAddrType	1.3.6.1.3.95.2.7.1.3
mplsTunnelARHopIpv4Addr	1.3.6.1.3.95.2.7.1.4
mplsTunnelARHopIpv4PrefixLen	1.3.6.1.3.95.2.7.1.5
mplsTunnelARHopIpv6Addr	1.3.6.1.3.95.2.7.1.6
mplsTunnelARHopIpv6PrefixLen	1.3.6.1.3.95.2.7.1.7
mplsTunnelARHopAsNumber	1.3.6.1.3.95.2.7.1.8
mplsTunnelARHopType	1.3.6.1.3.95.2.7.1.9
mplsTunnelCHopTable	1.3.6.1.3.95.2.8
mplsTunnelCHopEntry	1.3.6.1.3.95.2.8.1
mplsTunnelCHopListIndex	1.3.6.1.3.95.2.8.1.1

Table 4 MPLS-TE-MIB Objects (continued)

Object Name	Object Identifier
mplsTunnelCHopIndex	1.3.6.1.3.95.2.8.1.2
mplsTunnelCHopAddrType	1.3.6.1.3.95.2.8.1.3
mplsTunnelCHopIpv4Addr	1.3.6.1.3.95.2.8.1.4
mplsTunnelCHopIpv4PrefixLen	1.3.6.1.3.95.2.8.1.5
mplsTunnelCHopIpv6Addr	1.3.6.1.3.95.2.8.1.6
mplsTunnelCHopIpv6PrefixLen	1.3.6.1.3.95.2.8.1.7
mplsTunnelCHopAsNumber	1.3.6.1.3.95.2.8.1.8
mplsTunnelCHopType	1.3.6.1.3.95.2.8.1.9
mplsTunnelPerfTable	1.3.6.1.3.95.2.9
mplsTunnelPerfEntry	1.3.6.1.3.95.2.9.1
mplsTunnelPerfPackets	1.3.6.1.3.95.2.9.1.1
mplsTunnelPerfHCPackets	1.3.6.1.3.95.2.9.1.2
mplsTunnelPerfErrors	1.3.6.1.3.95.2.9.1.3
mplsTunnelPerfBytes	1.3.6.1.3.95.2.9.1.4
mplsTunnelPerfHCBytes	1.3.6.1.3.95.2.9.1.5
mplsTunnelTrapEnable	1.3.6.1.3.95.2.10
mplsTeNotifications	1.3.6.1.3.95.3
mplsTeNotifyPrefix	1.3.6.1.3.95.3.0
mplsTunnelUp	1.3.6.1.3.95.3.0.1
mplsTunnelDown	1.3.6.1.3.95.3.0.2
mplsTunnelRerouted	1.3.6.1.3.95.3.0.3