Periodic MIB Data Collection and Transfer Mechanism

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This document describes how to periodically transfer selected MIB data from Cisco IOS-based devices to specified Network Management Systems (NMS).

Finding Feature Information

Your software release may not support all the features documented in this module. For the latest feature information and caveats, see the release notes for your platform and software release. To find information about the features documented in this module, and to see a list of the releases in which each feature is supported, see the "Feature Information for Periodic MIB Data Collection and Transfer Mechanism" section on page 18.

Use Cisco Feature Navigator to find information about platform support and Cisco software image support. To access Cisco Feature Navigator, go to http://www.cisco.com/go/cfn. An account on Cisco.com is not required.

Contents

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

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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 Mechanism

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.
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 the Periodic MIB Data Collection and Transfer Mechanism 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** {**exact** \| **wild**} {**interface** *interface-id* [**sub-if**] \| **controller** *controller-id* [**sub-if**] \| **oid** *oid*}

4. **instance range start** *oid* **end** *oid* (optional)

5. **instance repetition** *oid-instance* **max** *repeat-number* (optional)

6. **poll-interval** *minutes*

7. **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 (config-bulk-sc) 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
	
	Example:
	`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.)

Step 4	`instance range start` *oid* **end** *oid* **Example:** `instance range start 1 end 2`	(Optional) When used in conjunction with the **snmp mib bulkstat schema** command, the **instance range** command can be used to configure a range of instances on which to collect data.

	Command or Action	**Purpose**
Step 5	`instance repetition` *oid-instance* `max` *repeat-number* **Example:** `instance repetition 1 max 4`	(Optional) When used in conjunction with the **snmp mib bulkstat schema** command, the **instance repetition** command can be used to configure data collection to repeat for a certain number of instances of a MIB object.
Step 6	`poll-interval` *minutes* **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 7	`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.

	Command or Action	Purpose
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.
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 is 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.
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.

	Command or Action	Purpose
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 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** [*transfer-name*]

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:

Example: Configuring Periodic MIB Data Collection and Transfer Mechanism

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 are 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 are 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.

```
snmp mib bulkstat object-list ifmib
 add ifInoctets
 add ifOutoctets
 add ifInUcastPkts
 add ifInDiscards
 exit
snmp mib bulkstat object-list CAR-mib
 add CcarStatSwitchedPkts
 add CcarStatSwitchedBytes
 add CcarStatFilteredBytes
 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
snmp mib bulkstat schema ATM2/0-IFMIB
! The following command points to the IF-MIB object list, defined above.
 object-list ifmib
 poll-interval 5
 instance exact interface ATM2/0 subif
 exit

! ATM CAR-MIB schema
snmp mib bulkstat schema-def ATM2/0-CAR
 object-list CAR-mib
 poll-interval 5
 instance wildcard interface ATM2/0 subif
 exit

!Ethernet IF-MIB schema
snmp mib bulkstat schema Ethernet2/1-IFMIB
 object-list ifmib
 poll-interval 5
 instance exact interface Ethernet2/1
 exit

! Ethernet CAR-MIB schema
snmp mib bulkstat schema Ethernet2/1-CAR
 object-list CAR-mib
 poll-interval 5
! Note: ifindex of Ethernet2/1 is 3
 instance wildcard oid 3.1
 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.

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

Related Documents

Related Topic	Document Title
Cisco IOS commands	*Cisco IOS Master Commands List, All Releases*
SNMP commands	*Cisco IOS Network Management Command Reference*
SNMP configuration tasks	"Configuring SNMP Support" module in the *Cisco IOS Network Management Configuration Guide*

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, as well as with SNMP.	To locate and download MIBs for selected platforms, Cisco software 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/cisco/web/support/index.html

Feature Information for Periodic MIB Data Collection and Transfer Mechanism

Use Cisco Feature Navigator to find information about platform support and software image support. Cisco Feature Navigator enables you to determine which software images support a specific software release, feature set, or platform. To access Cisco Feature Navigator, go to http://www.cisco.com/go/cfn. An account on Cisco.com is not required.

Note Table 1 lists only the software release that introduced support for a given feature in a given software release train. Unless noted otherwise, subsequent releases of that software release train also support that feature.

Table 1   Feature Information for Periodic MIB Data Collection and Transfer Mechanism

Feature Name	Releases	Feature Information
Periodic MIB Data Collection and Transfer Mechanism	12.0(24)S 12.3(2)T 12.2(25)S 12.2(33)SRA 12.2(33)SXH 12.2(33)SRC 12.2(33)SB 15.0(1)S Cisco IOS XE 3.1.0SG	This feature provides the ability to periodically transfer selected MIB data from Cisco IOS-based devices to specified Network Management Systems (NMS). Using the command-line interface (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. This feature was integrated into Cisco IOS Release 15.0(1)S.