



Segmentation and Reassembly Buffer Management Enhancements

This feature module describes the Segmentation and Reassembly Buffer Management Enhancements feature. It includes information on the benefits of the enhancements, supported platforms, related documents, and configuration.

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Feature Overview

This feature module describes the following enhancements to segmentation and reassembly (SAR) buffer management:

- Reduced Segmentation Buffer Size
- Increased Input/Output Memory Size
- Reserved Segmentation Buffer Slot for High-Priority Packets

Reduced Segmentation Buffer Size

Prior to this release, the default size of the PVC segmentation buffer was 256 packets. This meant that each PVC could queue up to 256 packets to be segmented and sent. Now the default size is 32 packets, and a new command allows you to manually change the segmentation buffer size.

Increased Input/Output Memory Size

Prior to this release, the default input/output (I/O) memory size was 16 MB for NRPs with 64 MB or 128 MB DRAM. Now the default I/O memory size is 18 MB for an NRP with 64 MB DRAM, and 36 MB for an NRP with 128 MB DRAM. You can also manually set the I/O memory size with an environment variable under ROMMON.

Reserved Segmentation Buffer Slot for High-Priority Packets

For each PVC, a segmentation buffer slot is reserved for high-priority packets.

Benefits

Improved Distribution of Memory Resources

The SAR buffer management enhancements reduce the amount of memory resources that can be held by congested PVCs. This prevents a small group of congested PVCs from using all available memory resources and adversely affecting the performance of other PVCs.

Improved High-Priority Packet Transmission

With a segmentation buffer slot reserved for high-priority packets, each PVC accommodates high-priority packets even when the segmentation buffer is full.

Restrictions

Because of process memory usage, setting the I/O memory size to a larger value might reduce the number of sessions that your NRP can handle.

Related Documents

- *Cisco 6400 UAC Software Configuration Guide*

Supported Platforms

The Segmentation and Reassembly Buffer Management Enhancements are supported on the node route processor (NRP) of the Cisco 6400 UAC.

Supported Standards, MIBs, and RFCs

Standards

None

MIBs

None

RFCs

None

Prerequisites

Cisco recommends that you simultaneously run Cisco IOS Release 12.1(1) DB on the node switch processor (NSP) of the Cisco 6400 UAC.

Configuration Tasks

See the following sections for configuration tasks for the Segmentation and Reassembly Buffer Management Enhancements feature. Each task in the list is optional.

- Setting the Segmentation Buffer Size
- Setting the I/O Memory Size

Setting the Segmentation Buffer Size



Caution

Entering the **atm vc tx** command can cause service disruption. Only enter this command during maintenance windows.

To manually set the size of all PVC segmentation buffers, enter the following commands beginning in global configuration mode:

	Command	Purpose
Step 1	Router(config)# service internal	Enables modification of PVC segmentation buffers.
Step 2	Router(config)# interface atm 0/0/0	Specifies the ATM interface.
Step 3	Router(config-if-atm-vc)# atm vc tx number	Sets the maximum number of packets in the PVC segmentation buffers.

Verifying the PVC Segmentation Buffer Size

To verify successful configuration of the segmentation buffer size, use the **show running-config EXEC** command.

Setting the I/O Memory Size

To manually set the size of I/O memory, enter the following command in ROMMON mode:

Command	Purpose
Step 1 Rommon> IOMEM=size	Sets the size, in MB, of I/O memory. Allowed values depend on the amount of DRAM on your NRP, and they are listed in Table 1.

Table 1 Allowed Values of I/O Memory on the Cisco 6400 NRP

Main Memory on NRP	Allowed I/O Memory Range	Default IOMEM Setting
64 MB DRAM	18 MB to 24 MB	18 MB
128 MB DRAM	18 MB to 60 MB	36 MB



Note

IOMEM entries must be an even number. If you enter an odd number, the NRP will round it down to an even number. If you enter a number outside of the allowed I/O memory range, the NRP will use the default IOMEM setting. You can also enter **unset IOMEM** in ROMMON to return to the default setting.

Verifying the I/O Memory Size

To verify that you successfully set the I/O memory size, use the **show memory EXEC** command. The following example shows an NRP with an I/O memory size of 16 MB:

```
router# show memory
          Head  Total (b)  Used (b)  Free (b)  Lowest (b)  Largest (b)
Processor 60E27540 35490496 5517076 29973420 14919296 29838876
      I/O   3000000 16777216 6006460 10770756 5385388 10770108
```

Configuration Examples

This section provides the following configuration examples:

- PVC Segmentation Buffer Size Configuration
- I/O Memory Size Configuration

PVC Segmentation Buffer Size Configuration

In the following example, the PVC segmentation buffer size is set to 64 packets.

```
!  
service internal  
interface atm 0/0/0  
    atm vc tx 64  
!
```

I/O Memory Size Configuration

In the following example, the I/O memory size is set to 20 MB.

```
Rommon>IOMEM=20
```

Command Reference

This section documents new commands. All other commands used with this feature are documented in the Cisco IOS Release 12.1 command reference publications.

- **atm vc tx**

atm vc tx

To set the PVC segmentation buffer size, use the **atm vc tx** interface configuration command. To revert to the default value of 32, use the **no** form of this command.

atm vc tx *number*

no atm vc tx *number*

Syntax Description	<i>number</i>	Maximum number of packets in the buffer queue. Possible values: 32, 64, 128, 256.
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Defaults	32	
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Command Modes	ATM VC	
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Command History	Release	Modification
	12.1(1) DC1	This command was introduced on the node route processor (NRP) of the Cisco 6400.

Usage Guidelines For each PVC, a segmentation buffer slot is reserved for high-priority packets.



Caution

Entering the **atm vc tx** command can cause service disruption. Only enter this command during maintenance windows.

Examples The following example sets the maximum number of packets in the segmentation buffer of each PVC to 64:

```
!
service internal
interface atm 0/0/0
→  atm vc tx 64
!
```

Related Commands	Command	Description
	service internal	Enables modification of PVC segmentation buffers.
	interface atm	Configures an ATM interface type and enters interface configuration mode.

Glossary

buffer—Storage area used for handling data in transit. Buffers are used in internetworking to compensate for differences in processing speed between network devices. Bursts of data can be stored in buffers until they can be handled by slower processing devices. Sometimes referred to as a packet buffer.

congested PVC—A PVC is congested if traffic enters the PVC faster than the traffic can be sent, and the segmentation buffer is full.

I/O—Input/output.

PVC—Permanent virtual circuit. Virtual circuit that is permanently established. PVCs save bandwidth associated with circuit establishment and tear down in situations where certain virtual circuits must exist all the time.

VC—Virtual channel. Logical circuit created to ensure reliable communication between two network devices. A VC is defined by a VPI/VCI pair, and can be either permanent (PVC) or switched (SVC).

