

## **Configuration Partitioning**

The Configuration Partitioning feature provides modularization ("partitioning") of the running configuration state to provide granular access to the running configuration in Cisco IOS software.

This feature is enabled by default in Cisco IOS software images that include this feature.

The configuration state of a device is retrieved dynamically whenever a user issues the **showrunning-config** command. When the Configuration Partitioning feature is enabled, the system groups the configuration state of the device into parts (called "partitions") so that only the configuration state the user wishes to review is retrieved when generating a displayed list of commands in the running configuration. This feature improves performance for high-end systems with complex configurations because only a part of the running configuration state is processed when generating the running configuration command list, as opposed to the existing method of processing the entire system configuration state.

Default configuration partitions are provided by the introduction of this feature; other Cisco IOS software features may define their own command partitions in later releases.

- Information About Configuration Partitioning, on page 1
- How to Use the Configuration Partitioning Feature, on page 2
- Configuration Examples for Configuration Partitioning, on page 5
- Additional References, on page 15
- Feature Information for Configuration Partitioning, on page 16

## Information About Configuration Partitioning

### **System Running Configurations**

Managing the configuration of any Cisco IOS software-based device involves managing the startup configuration (startup-config), which is a file stored in nonvolatile memory, and the running configuration (running-config), which is the set of all configuration options currently in effect on the system. Typically, the startup configuration file is loaded when the system boots, and changes to the system's running configuration, applied using the command-line interface (CLI), are saved by copying the running configuration to a configuration file (either locally or on the network), which can then be used to configure the device at startup, or used to configure other devices.

### **Retrieving the Running Configuration for Display or Copy Operations**

In the Cisco IOS software configuration model, the configuration state is maintained in a distributed manner, with each component storing its own configuration state. To retrieve global configuration information, the software must poll every component to collect the distributed information. This configuration state retrieval operation is performed by a process known as nonvolatile generation (NVGEN), and it is invoked by commands such as **showrunning-config**, which is used to display the current configuration state, and **copysystem:running-configuration**, which is used to save the running configuration by copying it to a file. When invoked, the NVGEN process queries each system component, each interface instance, and all other configured component objects in a standard sequence. A running configuration file is constructed as NVGEN traverses the system performing these queries, and it is this "virtual file" that is displayed or copied.

### **Benefits of Partitioning the Running Configuration**

The Configuration Partitioning feature is the latest in a series of Configuration Generation Performance Enhancement Features for Cisco IOS software. (See the "Related Documents" section for related features.) This feature improves the system's response time by providing a method for querying only the system component you wish to review when issuing the **showrunning-config** command.

When the Configuration Partitioning feature is enabled, the system groups the configuration state of the device into parts (called "partitions") for the purpose of generating the virtual running configuration file (the list of configuration commands). A new command, **showrunning-configpartition**, allows you to display only the part of the running configuration that you want to examine, rather than having to display the entire running configuration at once, or displaying only lines that match a certain string.

The key benefit of this feature is that it increases system performance by allowing the system to run the NVGEN process for only the collection of system components (such as specific interfaces) that you need to display. This is in contrast to other existing extensions to the **showrunning-config** command, which only filter the generated list after all system components have been processed.

The selective processing of the system's configuration state for the purpose of generating a partial running configuration is called "configuration partitioning."

More granular access to configuration information offers important performance benefits for high-end routing platforms with very large configuration files, while also enhancing configuration management by allowing advanced configuration features to be implemented at a more granular level. Advanced configuration options include Cisco IOS software support for provisioning of customer services, Config Rollback, Config Locking, and configuration access control.

## **How to Use the Configuration Partitioning Feature**

### **Displaying Configuration Partitions**

The main method of taking advantage of this feature is by using the **showrunning-configpartition** part command in priveledge exec mode, which is a specialized extension to the **showrunning-config** command.



Note

The partition part command extension is not available for the more: systemrunning-config command.

Because this feature offers improved performance for existing commands, this feature is enabled by default in Cisco IOS software images that support this feature. To quickly determine if this feature is supported and running on your system, issue the **showrunning-configpartition?** command in privileged EXEC mode.

### **SUMMARY STEPS**

- 1. show running-config partition?
- 2. show running-config partition part

#### **DETAILED STEPS**

### **Step 1** show running-config partition?

Issuing this command will show you the list of running configuration parts available for display on your system.

If the Configuration Partitioning feature is supported on your system and is enabled, you will see the string "config partition is TRUE" as the first line of help output.

If you receive an error message when entering the command syntax shown here, this feature is not supported on your system. See the command documentation for the **showrunning-config** command for existing extensions of that command in other releases that allow you to show only part of the running configuration.

Note

The list of available configuration parts may vary by software image and is dependent on what features are currently configured.

### **Example:**

```
Router# show running-config partition ?
config partition is TRUE
 access-list All access-list configurations
                All boot configurations
 boot
 class-map
common
global-cdp
                 All class-map configurations
                 All remaining unregistered configurations
               All global cdp configurations
                All Interface specific Configurations
 ip-as-path
 interface
 ip-static-routes All IP static configurations
                 All line mode configurations
 policy-map
route-map
                 All policy-map configurations
                  All route-map configurations
 router
                 All routing configurations
                 All SNMP configurations
 snmp
                  All TACACS configurations
 tacacs
```

Choose the part of the running configuration you want to display, and use the associated keyword as the *part* argument in Step 2.

### **Step 2 show running-config partition** *part*

As an example, to have the system perform the NVGEN process on only the components associated with the access-list parts of the running configuration state, and display only the access-list related configurations, you would enter the **showrunning-configpartitionaccess-list** command:

### **Example:**

#### Note

This command also allows you to run the NVGEN process and display the resulting output for specific interfaces. This is a key capability of this feature, as it was designed for systems with numerous active interfaces.

In the following example, the main configuration partition is the interface configuration, and the specific part of the configuration to be generated is the configuration for Fast Ethernet interface 0/0.

### **Example:**

```
Router# show running-config partition interface fastethernet0/0
Building configuration...
Current configuration: 213 bytes!
Configuration of Partition interface FastEthernet0/0!!
! interface FastEthernet0/0
ip address 10.4.2.39 255.255.255.0
no ip route-cache cef
no ip route-cache duplex half
ipv6 enable
no cdp enable
!
! end
```

### **Disabling the Configuration Partitioning Feature**

Because this feature offers improved performance for existing commands, this feature is enabled by default for Cisco IOS software images that support this feature. However, you may want to disable this feature if you determine that it is not needed, as this feature does use a small amount of system resources (memory and CPU utilization). To disable configuration partitioning, perform the following task, which assumes you are starting in user EXEC mode.

### **SUMMARY STEPS**

- 1. enable
- 2. configure terminal
- 3. no parser config partition

#### **DETAILED STEPS**

	Command or Action	Purpose
Step 1	enable	Enables privileged EXEC mode.
	Example:	• Enter your password if prompted.
	Router> enable	
Step 2	configure terminal	Enters global configuration mode.
	Example:	
	Router# configure terminal	
Step 3	no parser config partition	Disables the configuration partitioning feature.
	Example:	
	Router(config) # no parser config partition	
	Example:	
	Disabling config partitioning	
	Example:	
	Router(config)#	

### What to do next

### What to Do Next

To reenable the feature after it has been disabled, use the **parserconfigpartition** command in global configuration mode.



Note

As this feature is enabled by default, only the **no** form will appear in the running configuration file, or will be written to the startup configuration file when you issue the **copyrunning-configstartup-config**command.

## **Configuration Examples for Configuration Partitioning**

This section provides examples of displaying configuration partitions with the **show running-config partition** command:

### **Displaying Configuration Partitions Example**

In this example, the **showrunning-configpartition**command is used with related commands in a series of steps an administrator might take to check the status of a specific interface and the current configuration of some of the system's other components. Comparable filtered output from the standard

**showrunning-config**command (for example, **showrunning-config**|**includeaccess-list**) is included for demonstration purposes.



Note

The *part* argument can consist of multiple partition name keywords, as in **showrunning-configpartroutereigrp1**.

```
gt3-7200-3# show running-config partition ?
                  All access-list configurations
  boot
                  All boot configurations
                  All class-map configurations
  class-map
                   All global cdp configurations
  global-cdp
  interface
                   All Interface specific Configurations
  ip-as-path
                 All IP as-path configurations
 ip-community
                  All IP community list configurations
  ip-domain-list All ip domain list configurations
  ip-static-routes All IP static configurations
                   All line mode configurations
                   All policy-map configurations
 policy-map
 route-map
                  All route-map configurations
 router
                  All routing configurations
 service
                   All service configurations
                   All SNMP configurations
gt3-7200-3# show running-config partition access-list
Building configuration...
Current configuration: 87 bytes
access-list 90 permit 0.0.0.0 1.2.3.5
access-list 100 permit 10 any any
end
gt3-7200-3\# show running-config | include access-list
access-list 90 permit 0.0.0.0 1.2.3.5
access-list 100 permit 10 any any
gt3-7200-3#
gt3-7200-3# show running-config partition boot
Building configuration...
Current configuration: 51 bytes
boot network tftp:/service config.txt
end
gt3-7200-3# show running-config partition class-map
Building configuration...
Current configuration: 78 bytes
!
class-map match-all abc
 match anv
class-map match-all xyz
```

```
!
1
end
gt3-7200-3# show running-config | begin class-map
class-map match-all abc
 match any
class-map match-all xyz
!
gt3-7200-3# show running-config partition global-cdp
Building configuration...
Current configuration: 43 bytes
1
!
cdp timer 20
cdp holdtime 100
!
end
gt3-7200-3# show running-config | include
global-cdp
cdp timer 20
cdp holdtime 100
qt3-7200-3#
gt3-7200-3# show ip interface brief
Interface
                         IP-Address
                                        OK? Method Status
                                                                         Protocol
                         unassigned
                                        YES NVRAM administratively down down
FastEthernet0/0
                                       YES NVRAM up
Ethernet2/0
                         10.4.2.32
Ethernet2/1
                        unassigned
                                        YES NVRAM administratively down down
                        unassigned YES NVRAM administratively down down
Ethernet2/2
Ethernet2/3
                                         YES NVRAM administratively down down
                         unassigned
                                      YES NVRAM administratively down down
Serial3/0
                         unassigned
                                       YES NVRAM administratively down down
Serial3/1
                         unassigned
Serial3/2
                         unassigned
                                        YES NVRAM administratively down down
                                       YES NVRAM administratively down down
Serial3/3
                         unassigned
Loopback0
                          unassigned
                                         YES NVRAM administratively down down
Loopback234
                         unassigned
                                         YES NVRAM administratively down down
gt3-7200-3\# show running-config partition interface fastethernet0/0
Building configuration...
Current configuration: 98 bytes
!
interface FastEthernet0/0
no ip address
no ip route-cache
shut.down
duplex half
1
gt3-7200-3# show running-config partition interface ethernet2/0
Building configuration...
Current configuration: 122 bytes
1
interface Ethernet2/0
```

```
ip address 10.4.2.32 255.255.255.0
 no ip proxy-arp
no ip route-cache
duplex half
end
gt3-7200-3# show running-config partition interface ethernet2/1
Building configuration...
Current configuration : 94 bytes
interface Ethernet2/1
no ip address
no ip route-cache
 shutdown
 duplex half
end
gt3-7200-3# show running-config partition interface ethernet2/2
Building configuration...
Current configuration: 94 bytes
interface Ethernet2/2
no ip address
no ip route-cache
shutdown
duplex half
end
gt3-7200-3# show running-config partition interface ethernet2/3
Building configuration...
Current configuration : 94 bytes
interface Ethernet2/3
no ip address
no ip route-cache
 shutdown
duplex half
!
end
gt3-7200-3# show running-config partition interface serial3/0
Building configuration...
Current configuration: 103 bytes
interface Serial3/0
no ip address
no ip route-cache
shutdown
serial restart-delay 0
end
```

```
gt3-7200-3# show running-config partition interface serial3/1
Building configuration...
Current configuration : 103 bytes
interface Serial3/1
no ip address
no ip route-cache
shutdown
serial restart-delay 0
gt3-7200-3# show running-config partition interface serial3/2
Building configuration...
Current configuration: 103 bytes
interface Serial3/2
no ip address
no ip route-cache
shutdown
serial restart-delay 0
!
1
end
gt3-7200-3# show running-config partition interface serial3/3
Building configuration...
Current configuration: 103 bytes
interface Serial3/3
no ip address
no ip route-cache
shutdown
serial restart-delay 0
1
end
gt3-7200-3# show running-config partition interface loopback0
Building configuration...
Current configuration: 79 bytes
interface Loopback0
no ip address
no ip route-cache
shutdown
!
end
gt3-7200-3# show running-config partition interface loopback1
\mbox{\%} Invalid input detected at '^' marker.
gt3-7200-3\# show running-config partition interface loopback234
Building configuration...
Current configuration: 81 bytes
1
!
!
```

```
interface Loopback234
no ip address
no ip route-cache
shutdown
end
gt3-7200-3# configure terminal
Enter configuration commands, one per line. End with \mathtt{CNTL}/\mathtt{Z}.
gt3-7200-3(config) \# interface ethernet 2/0.1
gt3-7200-3(config-subif)# exit
gt3-7200-3(config)# exit
gt3-7200-3#
00:13:05: %SYS-5-CONFIG I: Configured from console by console
gt3-7200-3# show running-config partition interface ethernet2/0.1
Building configuration...
Current configuration : 58 bytes
interface Ethernet2/0.1
no ip route-cache
1
end
gt3-7200-3# show run partition ip?
ip-as-path ip-community ip-domain-list ip-static-routes
gt3-7200-3#sh run part ip-as
gt3-7200-3#sh run part ip-as-path
Building configuration...
Current configuration: 125 bytes
ip as-path access-list 2 permit $ABC
ip as-path access-list 2 permit $xyz*
ip as-path access-list 2 permit qwe*
end
gt3-7200-3# show running-config partition ip-community
Building configuration...
Current configuration: 92 bytes
ip community-list standard asd permit
ip community-list expanded qwe deny uio*
end
gt3-7200-3# show running-config | include ip community
ip community-list standard asd permit
ip community-list expanded qwe deny uio*
gt3-7200-3#
gt3-7200-3# show running-config partition ip-domain-list
Building configuration...
Current configuration: 70 bytes
ip domain-list iop
ip domain-list tyu
ip domain-list jkl
```

```
1
gt3-7200-3# show running-config partition
 ip-static-routes
Building configuration...
Current configuration: 98 bytes
ip route 0.0.0.0 0.0.0.0 Ethernet2/0
ip route 171.69.1.129 255.255.255.255 10.4.29.1
end
gt3-7200-3# show running-config partition line
Building configuration...
Current configuration: 489 bytes
1
line con 0
 exec-timeout 0 0
 transport output lat pad v120 mop telnet rlogin udptn nasi
 stopbits 1
line aux 0
 transport output lat pad v120 mop telnet rlogin udptn nasi
 stopbits 1
line vty 0
password lab
 login
 transport input lat pad v120 mop telnet rlogin udptn nasi
 transport output lat pad v120 mop telnet rlogin udptn nasi
line vty 1 4
 transport input lat pad v120 mop telnet rlogin udptn nasi
transport output lat pad v120 mop telnet rlogin udptn nasi
end
\verb|gt3-7200-3| \verb| show running-config partition policy-map|
Building configuration...
Current configuration: 162 bytes
policy-map qwer
description policy-map qwer.
 class xyz
   shape peak 8000 32 32
policy-map p1
policy-map sdf
 class abc
   set precedence 4
gt3-7200-3# show running-config partition route-map
Building configuration...
Current configuration: 65 bytes
```

```
route-map iop permit 10
route-map rty permit 10
!
!
end
gt3-7200-3#sh run part router bgp 1
Building configuration...
Current configuration: 111 bytes
router bgp 1
no synchronization
bgp log-neighbor-changes
distance bgp 2 2 2
no auto-summary
end
gt3-7200-3\#sh run part router egp ?
<0-65535> Remote autonomous system number
gt3-7200-3#sh run part router egp 1
Building configuration...
Current configuration: 46 bytes
!
router egp 1
timers egp 20 20
end
gt3-7200-3# show running-config partition router ?
 bgp
          Border Gateway Protocol (BGP)
           Exterior Gateway Protocol (EGP)
 egp
          Enhanced Interior Gateway Routing Protocol (EIGRP)
 eigrp
           ISO IS-IS
 isis
 iso-igrp IGRP for OSI networks
 mobile
           Mobile routes
           On Demand stub Routes
 odr
           Open Shortest Path First (OSPF)
 ospf
 rip
           Routing Information Protocol (RIP)
gt3-7200-3# show running-config partition router eigrp ?
<1-65535> Autonomous system number
gt3-7200-3# show running-config partition router eigrp 1
Building configuration...
Current configuration: 13 bytes
!
end
gt3-7200-3#
gt3-7200-3\# sh run part router eigrp 2
Building configuration...
Current configuration : 57 bytes
router eigrp 2
variance 10
```

```
auto-summary
1
end
gt3-7200-3\# show running-config partition router ?
 bgp
           Border Gateway Protocol (BGP)
           Exterior Gateway Protocol (EGP)
  egp
           Enhanced Interior Gateway Routing Protocol (EIGRP)
  eigrp
  isis
           ISO IS-IS
 iso-igrp IGRP for OSI networks
          Mobile routes
 mobile
 odr
           On Demand stub Routes
 ospf
           Open Shortest Path First (OSPF)
           Routing Information Protocol (RIP)
gt3-7200-3# show running-config partition router isis ?
 WORD ISO routing area tag
 Output modifiers
 <cr>
gt3-7200-3\# show running-config partition router isis qwe
Building configuration...
Current configuration: 86 bytes
router isis qwe
set-attached-bit route-map qwer
use external-metrics
end
gt3-7200-3\# show running-config partition router isis ?
 WORD ISO routing area tag
        Output modifiers
 <cr>
gt3-7200-3# show running-config partition router iso
gt3-7200-3# show running-config partition router iso-igrp ?
  WORD ISO routing area tag
  Output modifiers
 <cr>
gt3-7200-3\# show running-config partition router iso-igrp
Building configuration...
Current configuration : 31 bytes
!
!
router iso-igrp
!
gt3-7200-3\# show running-config | begin iso
router iso-igrp
router isis qwe
set-attached-bit route-map qwer
use external-metrics
!
router egp 1
timers egp 20 20
router bgp 1
no synchronization
bgp log-neighbor-changes
distance bgp 2 2 2
```

```
no auto-summary
gt3-7200-3# show running-config partition router ?
            Border Gateway Protocol (BGP)
  eap
            Exterior Gateway Protocol (EGP)
            Enhanced Interior Gateway Routing Protocol (EIGRP)
 isis
            ISO IS-IS
 iso-igrp IGRP for OSI networks
 mobile
            Mobile routes
            On Demand stub Routes
 odr
 ospf
            Open Shortest Path First (OSPF)
 rip
            Routing Information Protocol (RIP)
gt3-7200-3# show running-config partition router mobile ?
 | Output modifiers
  <cr>
gt3-7200-3# show running-config partition router mobile
Building configuration...
Current configuration: 42 bytes
router mobile
distance 20
end
gt3-7200-3# sh run | include router
router mobile
router odr
router eigrp 2
router ospf 4
router iso-igrp
router isis qwe
router egp 1
router bgp 1
gt3-7200-3\# show running-config partition router ?
            Border Gateway Protocol (BGP)
 bgp
  egp
            Exterior Gateway Protocol (EGP)
            Enhanced Interior Gateway Routing Protocol (EIGRP)
  eigrp
 isis
            ISO IS-IS
 iso-igrp IGRP for OSI networks
            Mobile routes
 mobile
            On Demand stub Routes
 odr
 ospf
            Open Shortest Path First (OSPF)
            Routing Information Protocol (RIP)
qt3-7200-3# show running-config partition router ospf ?
 <1-65535> Process ID
\verb|gt3-7200-3| # \mathbf{show} \ \mathbf{running-config} \ \mathbf{partition} \ \mathbf{router} \ \mathbf{ospf} \ \mathbf{4}
Building configuration...
Current configuration: 64 bytes
router ospf 4
log-adjacency-changes
distance 4
end
gt3-7200-3# sh run part service
```

```
Building configuration...
Current configuration: 190 bytes
no service pad
service timestamps debug uptime
service timestamps log uptime
no service password-encryption
service internal
service udp-small-servers
service tcp-small-servers
end
gt3-7200-3# sh run part snmp
Building configuration...
Current configuration: 84 bytes
!
\verb|snmp-server| community user 101 RW|
snmp mib target list qwe host 0.0.0.0
end
```

# **Additional References**

The following sections provide references related to the Configuration Partitioning feature.

### **Related Documents**

Related Topic	Document Title
Running configuration performance enhancementparserconfigcache for interfaces.	Configuration Generation Performance Enhancement
Provisioning of customer services, Config Rollback, Config Locking, and configuration access control	Contextual Configuration Diff Utility
Configuration managementConfig change logging.	Configuration Change Notification and Logging
Configuration managementQuick-save for config change logging <sup>1</sup> .	Configuration Logger Persistency
Cisco IOS software configuration access control and config session locking ("Config Lock").	Exclusive Configuration Change Access and Access Session Locking

The "Configuration Logger Persistency" feature allows saving just the commands entered since the last startup-config file was generated, rather than saving the entire startup configuration.

#### **Standards**

Standard	Title
No standards are associated with this feature.	

#### **MIBs**

MIB	MIBs Link
No new or modified MIBs are supported by this feature, and support for existing MIBs has not	
been modified by this feature.	

### **RFCs**

	itle		RF
No new or modified RFCs are supported by this feature, and support for existing RFCs has not been modified by this feature.	-	11 , 11	1

#### **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.	1 1
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	

# **Feature Information for Configuration Partitioning**

The following table provides release information about the feature or features described in this module. This table 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.

Use Cisco Feature Navigator to find information about platform support and Cisco software image support. To access Cisco Feature Navigator, go to <a href="https://www.cisco.com/go/cfn">www.cisco.com/go/cfn</a>. An account on Cisco.com is not required.

Table 1: Feature Information for Configuration Partitioning

Feature Name	Releases	Feature Information
Configuration Partitioning	12.2(33)SRB 12.2(33)SB 12.2(33)SXI	The Configuration Partitioning feature provides modularization ("partitioning") of the running configuration state to provide granular access to the running configuration in Cisco IOS software. This feature is enabled by default in Cisco IOS software images that include this feature.  In 12.2(33)SB, this feature was implemented on the Cisco 10000 series.  The following sections provide information about this feature:  • Information About Configuration Partitioning  • How to Use the Configuration Partitioning Feature

**Feature Information for Configuration Partitioning**