Startup Config vs Running Config

Cisco IOS devices maintain two primary configuration files: the running configuration and the startup configuration. Understanding the differences between these files and how to manage them is critical for network administrators to ensure proper device operation and configuration persistence.

Running Configuration (running-config)

Location: RAM (Random Access Memory)

View Command: *show running-config*

The running configuration is the active configuration currently being used by the device. All configuration changes made through the CLI are immediately applied to the running-config and take effect in real-time. Because this file resides in volatile RAM, it is lost when the device is powered off or rebooted unless explicitly saved.

Key Characteristics:

- Changes are applied immediately without requiring a reboot
- Stored in volatile memory (RAM)
- Lost upon power cycle or reload if not saved
- Reflects the current operational state of the device

Startup Configuration (startup-config)

Location: NVRAM (Non-Volatile RAM)

View Command: *show startup-config*

The startup configuration is the saved configuration that the device loads during the boot process. This file is stored in non-volatile memory (NVRAM), which retains data even when the device is powered off. The startup-config determines the initial state of the device after a reboot.

Key Characteristics:

- Loaded automatically during device boot-up
- Stored in non-volatile memory (NVRAM)
- Persists through power cycles and reboots
- Must be manually updated to reflect running-config changes

The Critical Difference

The most important distinction is that configuration changes affect only the running-config. If the device reboots before the running-config is saved to the startup-config, all unsaved changes will be lost. This is both a safety feature (allowing administrators to test changes before committing them) and a potential pitfall if changes are not properly saved.

Essential Configuration Management Commands

Command	Function
show running-config	Display the active configuration in RAM
show startup-config	Display the saved configuration in NVRAM
copy running-config startup-config	Save the running-config to NVRAM (persist changes)
write memory	Shortcut command to save running-config (legacy)
write	Another shortcut to save configuration
copy startup-config running-config	Restore startup-config to running-config (reload saved settings)
erase startup-config	Delete the startup configuration from NVRAM
reload	Restart the device (loads startup-config into RAM)

Understanding the relationship between running-config and startup-config is fundamental to effective Cisco device management. The separation between active and saved configurations provides flexibility for testing while requiring deliberate action to make changes permanent—a design that promotes careful network administration.