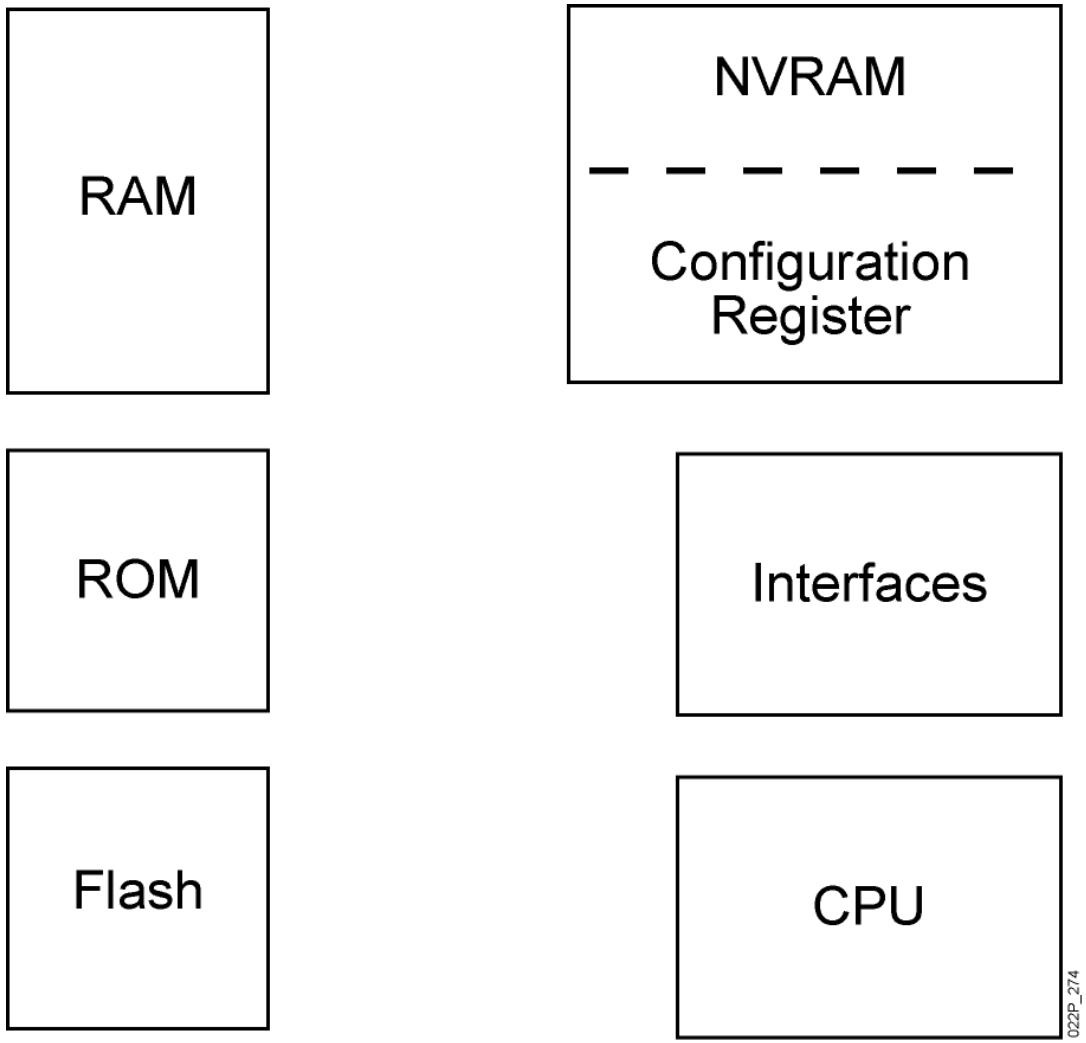
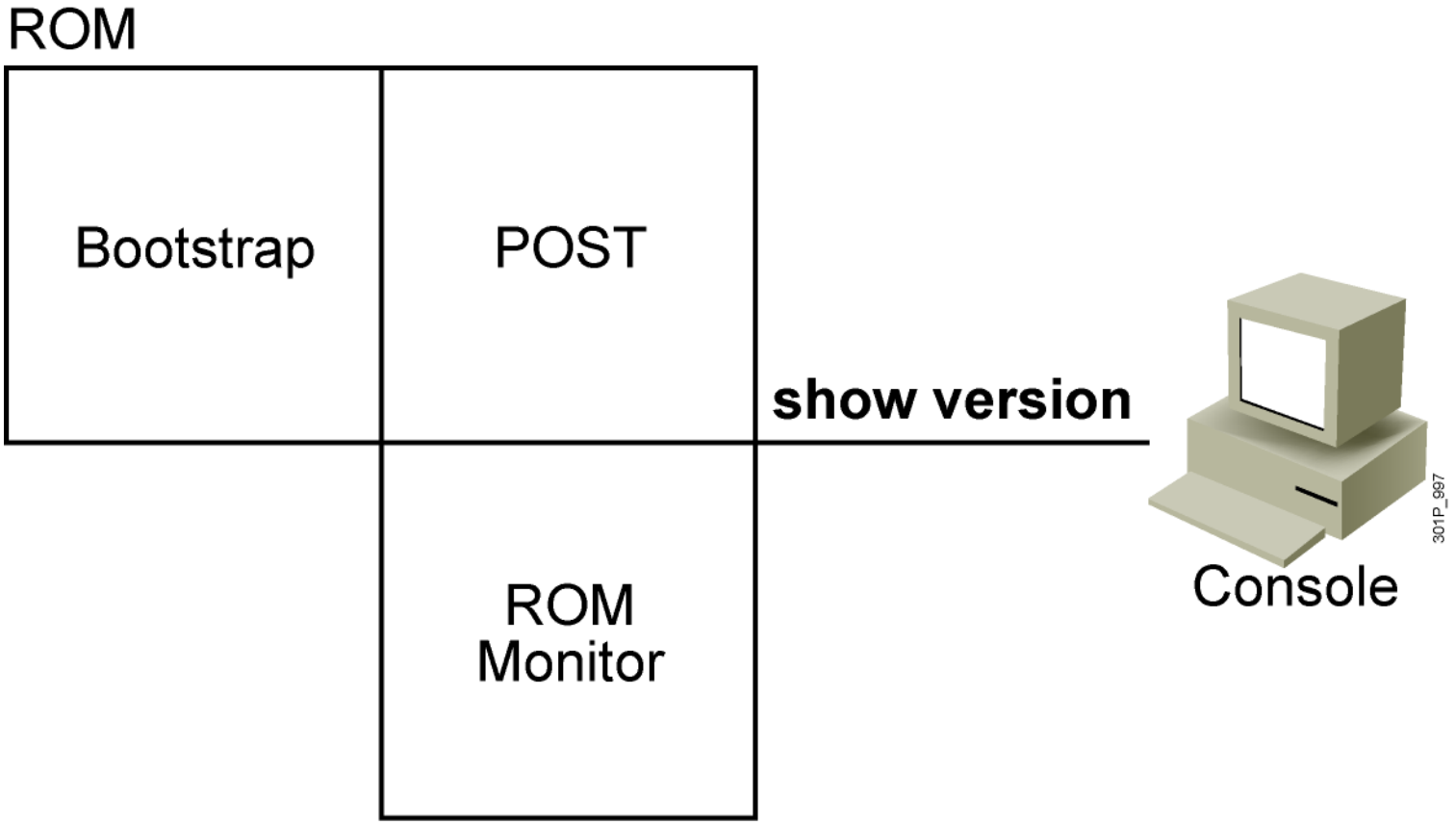
Basic config Router

Router Cisco 2811

Router Internal Components



ROM Functions

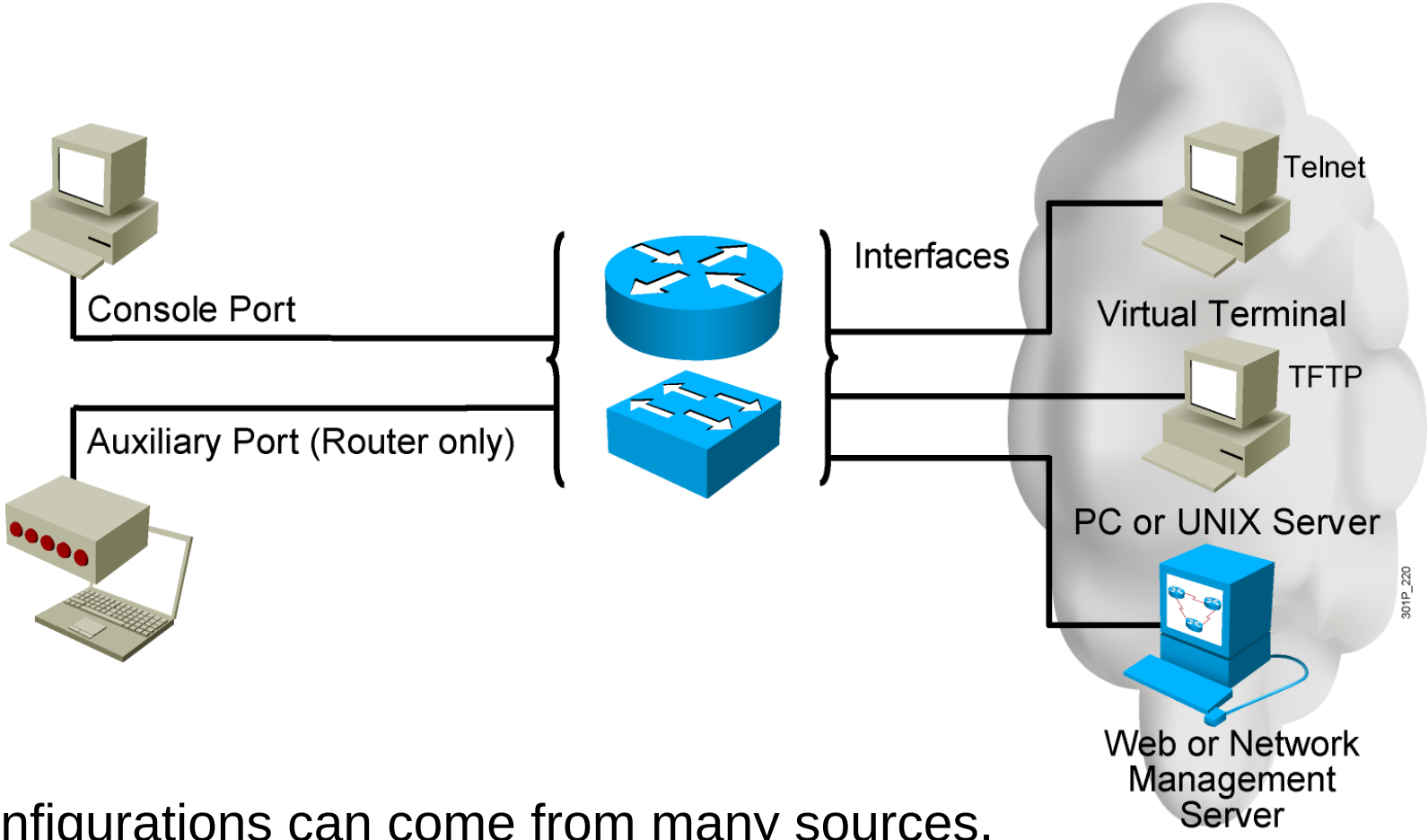


Contains microcode for basic functions

Router Power-On Boot Sequence

1. Perform power-on self-test (POST).
2. Load and run bootstrap code.
3. Find the Cisco IOS Software.
4. Load the Cisco IOS Software.
5. Find the configuration.
6. Load the configuration.
7. Run the configured Cisco IOS Software.

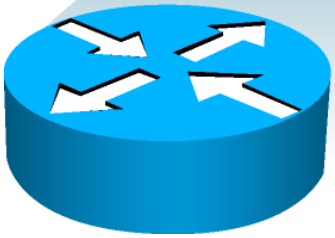
External Configuration Sources



- Configurations can come from many sources.
- Configurations will act in device memory.

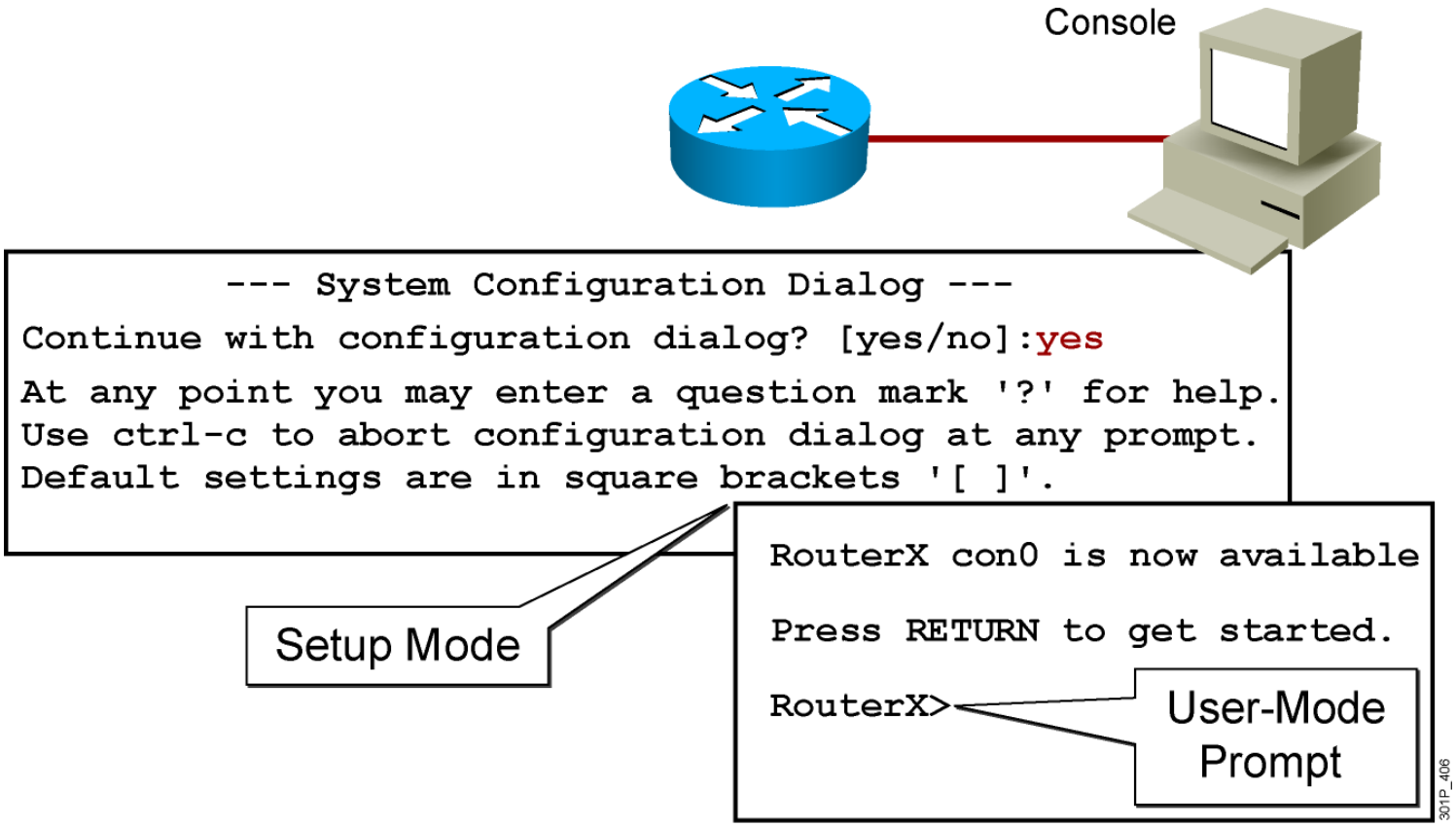
Initial Startup of the Cisco Router

- System startup routines initiate router software
- Router falls back to startup alternatives if needed



1. Before you start the router, verify the power, cabling, and console connection.
2. Push the power switch to “on.”
3. Observe the boot sequence:
   - Cisco IOS Software output text appears on the console.

Bootup Output from the Router

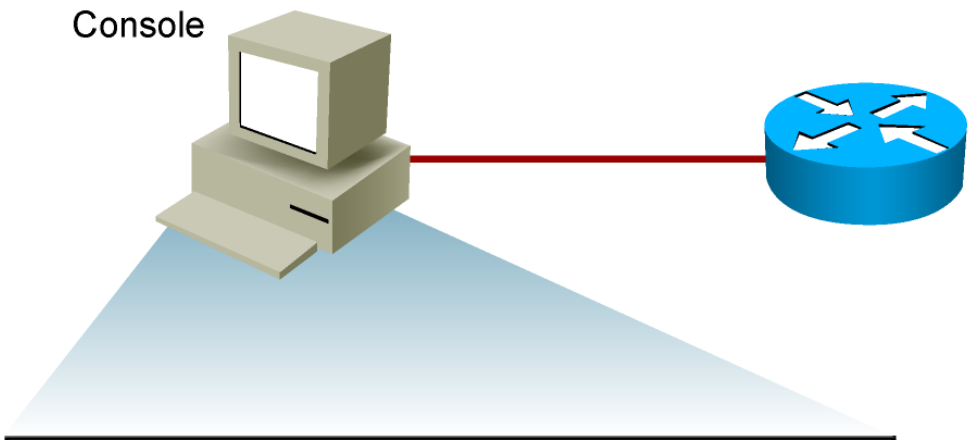


Unconfigured vs. Configured Router

Setup: The Initial Configuration Dialog

```
Router#setup


        --- System Configuration Dialog ---

Continue with configuration dialog? [yes/no]: yes

At any point you may enter a question mark '?' for help.
Use ctrl-c to abort configuration dialog at any prompt.
Default settings are in square brackets '[]'.


Basic management setup configures only enough connectivity
for management of the system, extended setup will ask you
to configure each interface on the system

Would you like to enter basic management setup? [yes/no]: no
```

Logging in to the Cisco Router



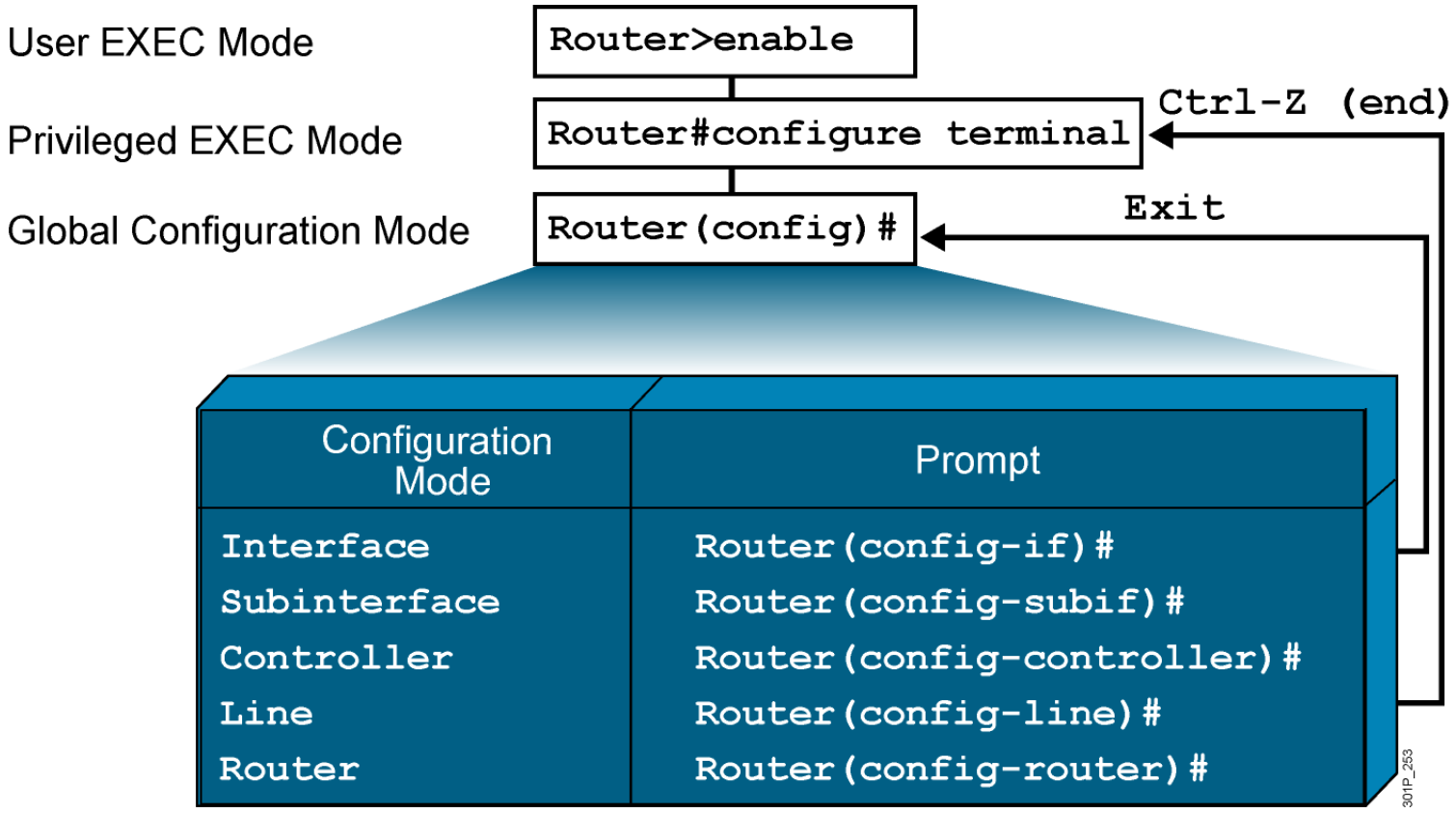

```
wg_ro_c con0 is now available
Press RETURN to get started.

RouterX>
RouterX>password
RouterX>enable
RouterX#
RouterX#disable
RouterX>
RouterX>logout
```

User-Mode Prompt

Privileged-Mode Prompt

301P_407

Overview of Router Modes



Router User-Mode Command List

```
RouterX>?
Exec commands:
  access-enable     Create a temporary Access-List entry
  access-profile    Apply user-profile to interface
  clear             Reset functions
  connect           Open a terminal connection
  disable           Turn off privileged commands
  disconnect        Disconnect an existing network connection
  enable            Turn on privileged commands
  exit              Exit from the EXEC
  help              Description of the interactive help system
  lat               Open a lat connection
  lock              Lock the terminal
  login             Log in as a particular user
  logout            Exit from the EXEC
-- More --
```

You can abbreviate a command to the fewest characters that make a unique character string.

Router Privileged-Mode Command List

```
RouterX#?
Exec commands:
  access-enable    Create a temporary Access-List entry
  access-profile   Apply user-profile to interface
  access-template  Create a temporary Access-List entry
  bfe              For manual emergency modes setting
  cd               Change current directory
  clear            Reset functions
  clock            Manage the system clock
  configure        Enter configuration mode
  connect          Open a terminal connection
  copy             Copy from one file to another
  debug            Debugging functions (see also 'undebug')
  delete           Delete a file
  dir              List files on a filesystem
  disable          Turn off privileged commands
  disconnect       Disconnect an existing network connection
  enable           Turn on privileged commands
  erase            Erase a filesystem
  exit             Exit from the EXEC
  help             Description of the interactive help system
-- More --
```

You can complete a command string by entering the unique character string, then pressing the Tab key.

show version **Command**

```
Cisco IOS Software, 2800 Software (C2800NM-ADVIPSERVICESK9-M), Version 12.4(12), RELEASE SOFTWARE (fc1)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2006 by Cisco Systems, Inc.
Compiled Fri 17-Nov-06 12:02 by prod_rel_team

ROM: System Bootstrap, Version 12.4(13r)T, RELEASE SOFTWARE (fc1)

RouterX uptime is 2 days, 21 hours, 15 minutes
System returned to ROM by power-on
System image file is "flash:c2800nm-advipservicesk9-mz.124-12.bin"


This product contains cryptographic features and is subject to United States and local country laws
governing import, export, transfer and use. Delivery of Cisco cryptographic products does not imply
third-party authority to import, export, distribute or use encryption. Importers, exporters, distributors
and users are responsible for compliance with U.S. and local country laws. By using this product you agree
to comply with applicable laws and regulations. If you are unable to comply with U.S. and local laws, return
this product immediately.

A summary of U.S. laws governing Cisco cryptographic products may be found at:
http://www.cisco.com/wwl/export/crypto/tool/stqrg.html

If you require further assistance please contact us by sending email to
export@cisco.com.

Cisco 2811 (revision 53.50) with 249856K/12288K bytes of memory.
Processor board ID FTX1107A6BB
2 FastEthernet interfaces
2 Serial(sync/async) interfaces
1 Virtual Private Network (VPN) Module
DRAM configuration is 64 bits wide with parity enabled.
239K bytes of non-volatile configuration memory.
62720K bytes of ATA CompactFlash (Read/Write)

Configuration register is 0x2102

RouterX#
```

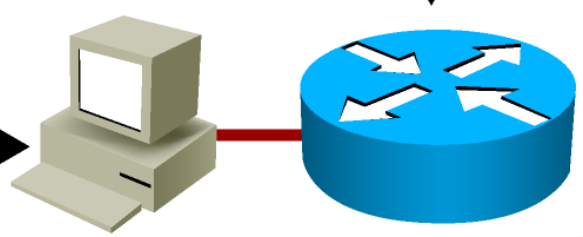
Configuring Router Identification

Router Name

```
Router(config)#hostname RouterX
RouterX(config)#
```

Message-of-the-Day Banner

```
RouterX(config)#banner motd  #
      Enter TEXT message. End with
      the character #. You have
      entered a secured system.
      Authorized access only! #
```



327P_131

Console-Line Commands

```
RouterX(config)#line console 0
RouterX(config-line)#exec-timeout 20 30
```

- Modifies console session timeout

```
RouterX(config)#line console 0
RouterX(config-line)#logging synchronous
```

- Redisplays interrupted console input

Configuring an Interface

```
RouterX(config)#interface type number
RouterX(config-if)#
```

- type includes serial, ethernet, token ring, fddi, hssi, loopback, dialer, null, async, atm, bri, tunnel, and so on
- number is used to identify individual interfaces

```
RouterX(config)#interface type slot/port
RouterX(config-if)#
```

- For modular routers, selects an interface

```
RouterX(config-if)#exit
```

- Quits from current interface configuration mode

Configuring an Interface Description

```
RouterX(config-if)# description string
```

- *string is a c*omment or a description to help you remember what is attached to this interface.
- The maximum number of characters for the *string* argument is 238.

Disabling or Enabling an Interface

```
RouterX#configure terminal
RouterX(config)#interface serial 0
RouterX(config-if)#shutdown
%LINK-5-CHANGED: Interface Serial0, changed state to administratively down
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0, changed state to down
```

- Administratively turns off an interface

```
RouterX#configure terminal
RouterX(config)#interface serial 0
RouterX(config-if)#no shutdown
%LINK-3-UPDOWN:  Interface Serial0, changed state to up
%LINEPROTO-5-UPDOWN: Line Protocol on Interface Serial0, changed state to up
```

- Enables an interface that is administratively shut down

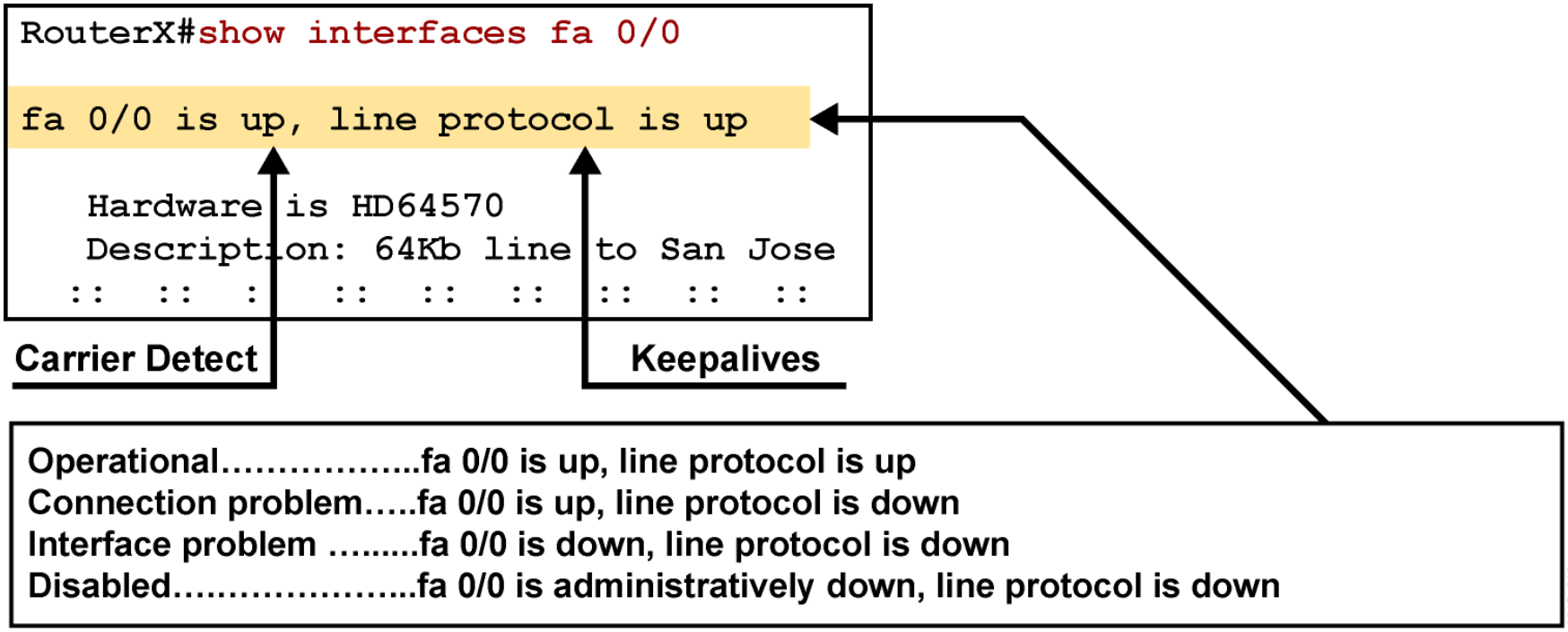
Configuring IP Addresses

```
RouterX#configure terminal
RouterX(config)#interface serial 0
RouterX(config-if)#ip address 192.168.1.1 255.255.255.0
RouterX(config-if)#no shutdown
%LINK-3-UPDOWN:  Interface Serial0, changed state to up
%LINEPROTO-5-UPDOWN: Line Protocol on Interface Serial0, changed state to up
```

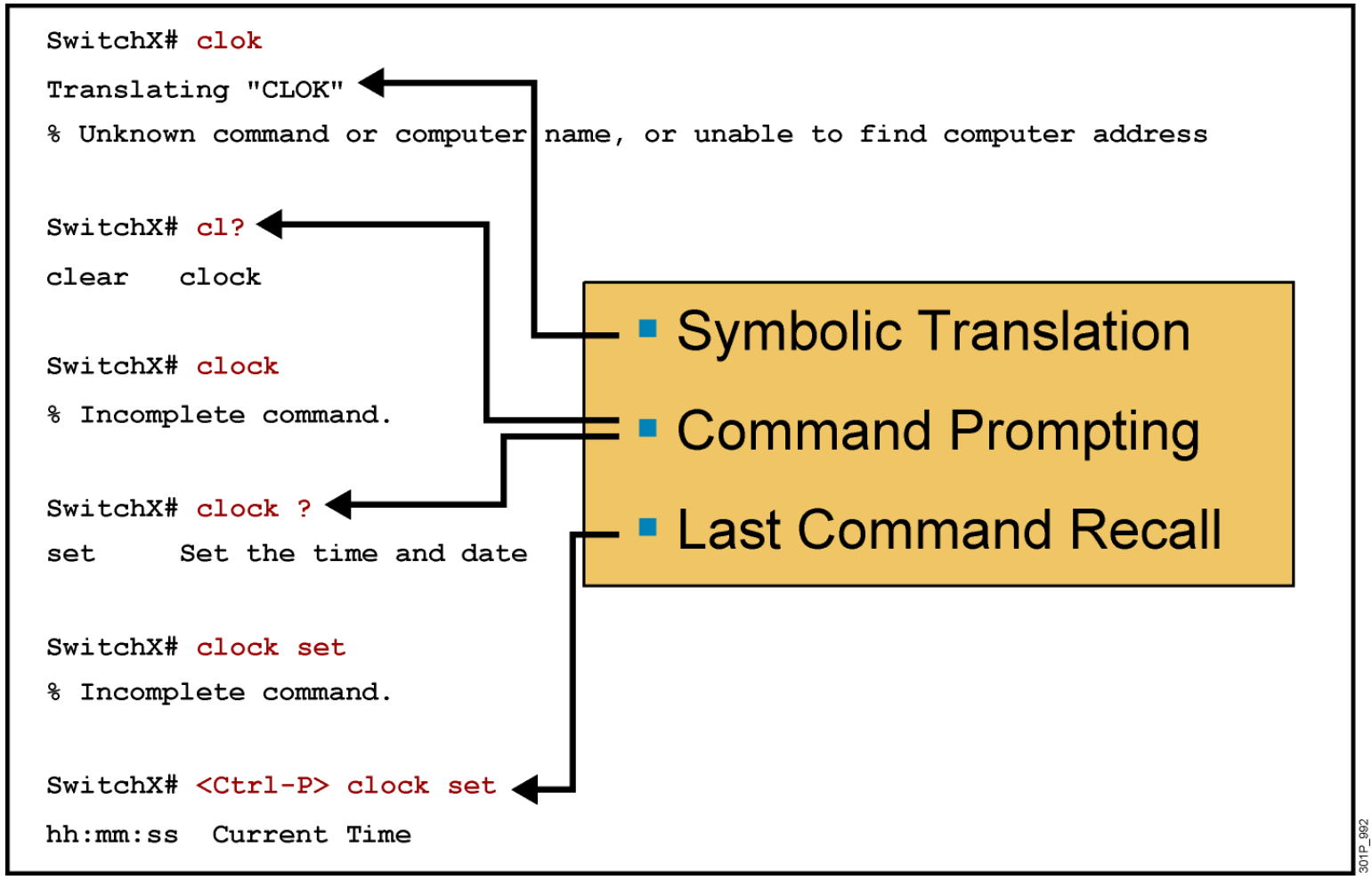
Router show interfaces **Command**

```
RouterX#show interfaces
Ethernet0 is up, line protocol is up
  Hardware is Lance, address is 00e0.1e5d.ae2f (bia 00e0.1e5d.ae2f)
  Internet address is 10.1.1.11/24
  MTU 1500 bytes, BW 10000 Kbit, DLY 1000 usec, rely 255/255, load 1/255
  Encapsulation ARPA, loopback not set, keepalive set (10 sec)
  ARP type: ARPA, ARP Timeout 04:00:00
  Last input 00:00:07, output 00:00:08, output hang never
  Last clearing of "show interface" counters never
  Queueing strategy: fifo
  Output queue 0/40, 0 drops; input queue 0/75, 0 drops
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
     81833 packets input, 27556491 bytes, 0 no buffer
     Received 42308 broadcasts, 0 runts, 0 giants, 0 throttles
     1 input errors, 0 CRC, 0 frame, 0 overrun, 1 ignored, 0 abort
     0 input packets with dribble condition detected
     55794 packets output, 3929696 bytes, 0 underruns
     0 output errors, 0 collisions, 1 interface resets
     0 babbles, 0 late collision, 4 deferred
     0 lost carrier, 0 no carrier
     0 output buffer failures, 0 output buffers swapped out
```

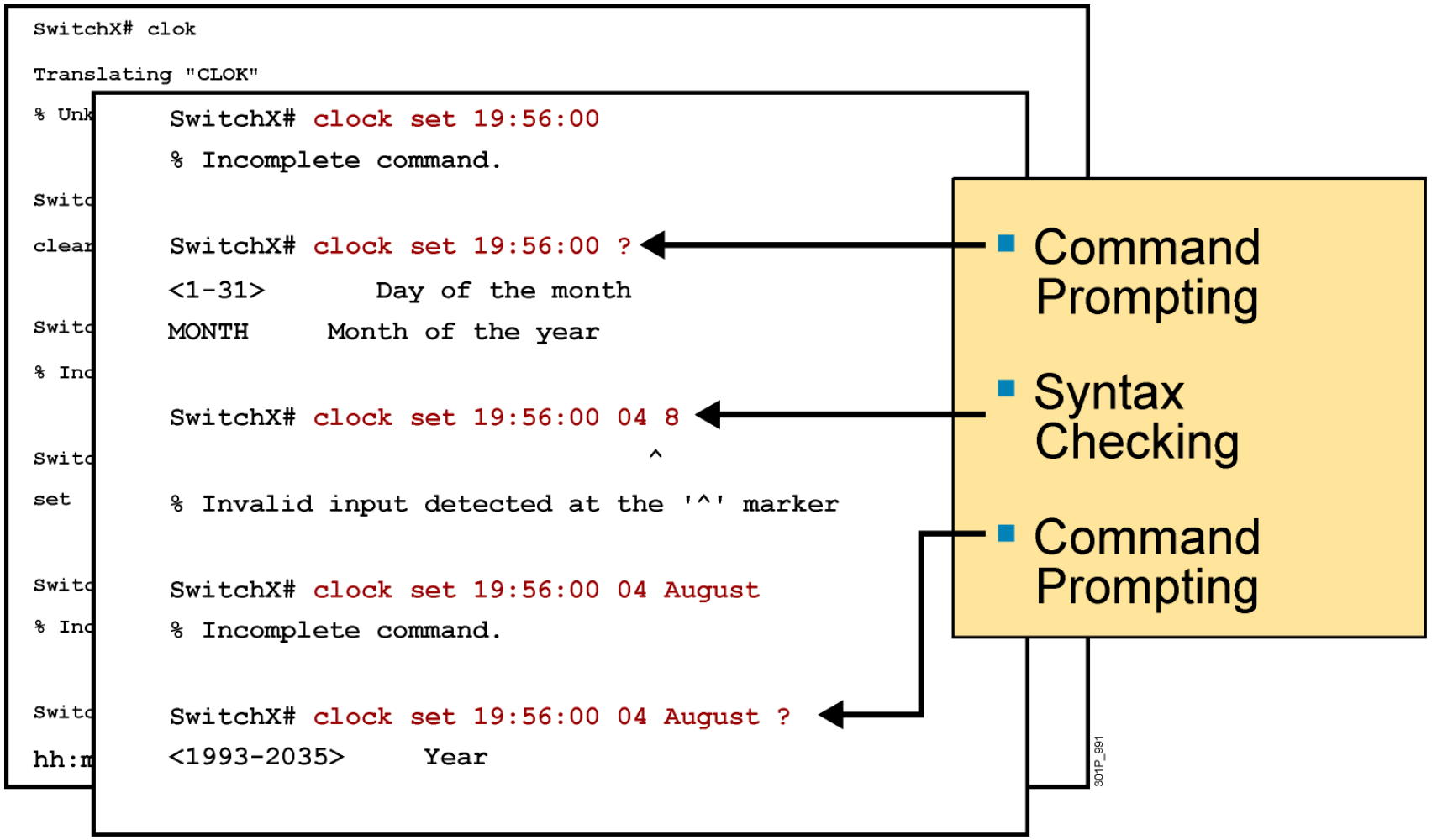
Interpreting the Interface Status



Context-Sensitive Help



Context-Sensitive Help (Cont.)



Enhanced Editing Commands (Cont.)

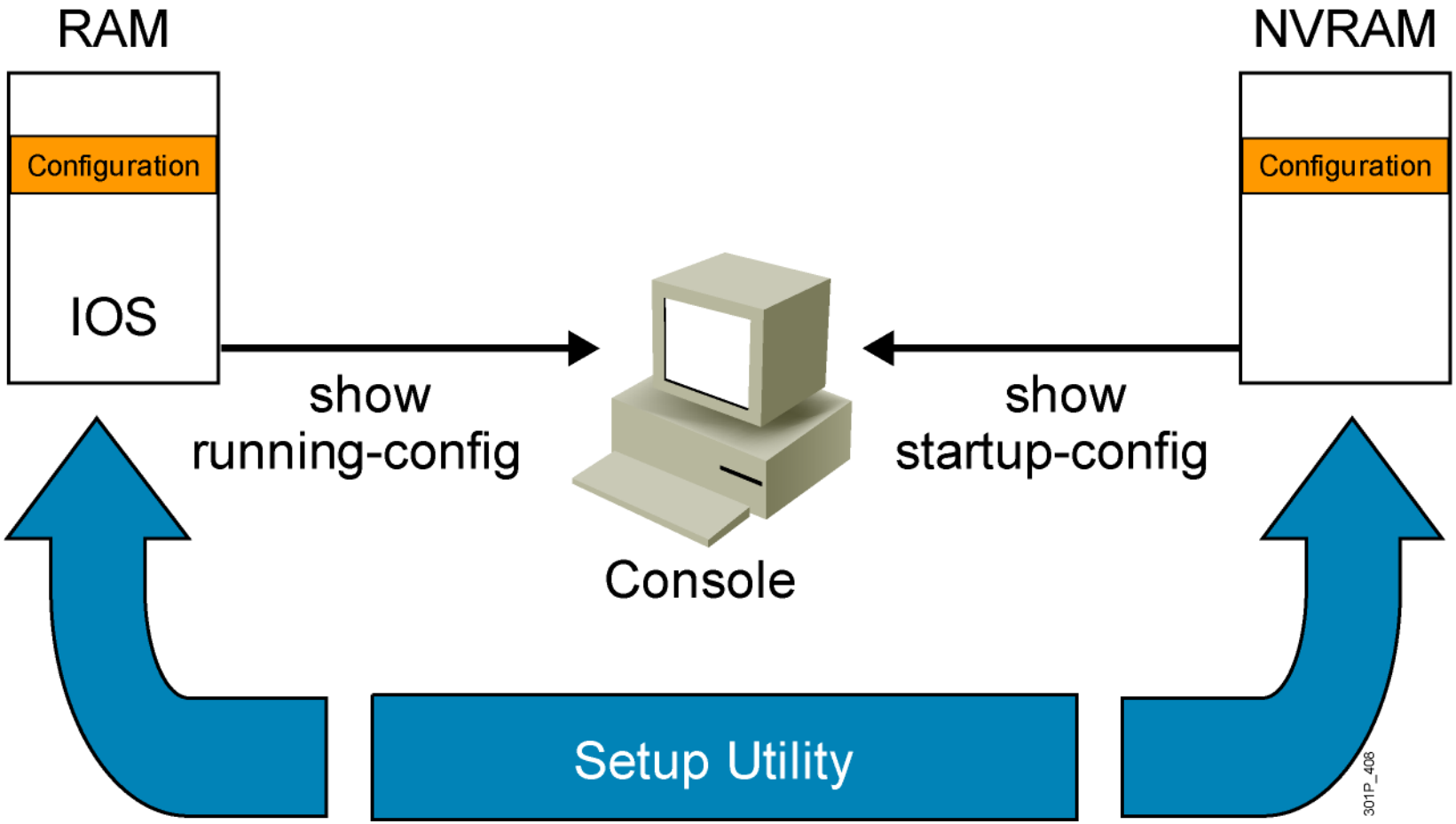
```
SwitchX>$ value for customers, employees, and partners.
```

	(Automatic scrolling of long lines)
Ctrl-A	Move to the beginning of the command line.
Ctrl-E	Move to the end of the command line.
Esc-B	Move back one word.
Esc-F	Move forward one word.
Ctrl-B	Move back one character.
Ctrl-F	Move forward one character.
Ctrl-D	Delete a single character.

Router Command History

Ctrl-P or Up Arrow	Recalls last (previous) commands.
Ctrl-N or Down Arrow	Recalls more recent commands.
`show history`	Shows command buffer contents.
`terminal history size` *`lines`*	Sets session command buffer size.

Viewing the Configuration



Saving Configurations

```
RouterX#
RouterX#copy running-config startup-config
Destination filename [startup-config]?
Building configuration…

RourterX#
```

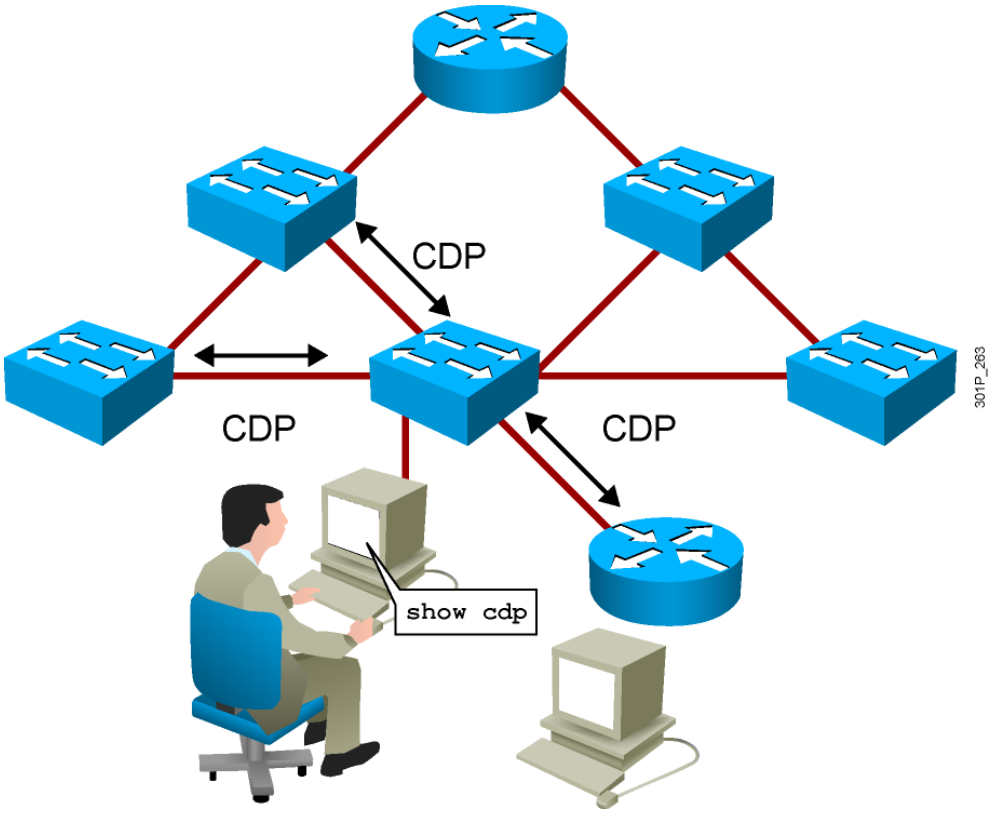
Copies the current configuration to NVRAM

Network Environment Management

CDP - LLDP

Discovering Neighbors with Cisco Discovery Protocol

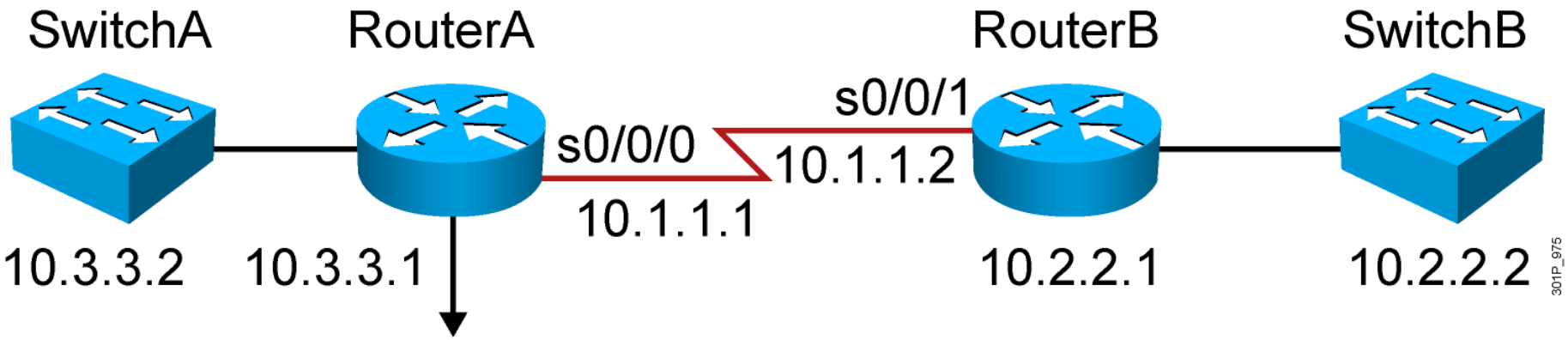
- **Cisco Discovery Protocol runs on Cisco IOS devices.**
- **Summary information includes:**
  - Device identifiers
  - Address list
  - Port identifier
  - Capabilities list
  - Platform



Neighbor Discovery Protocols

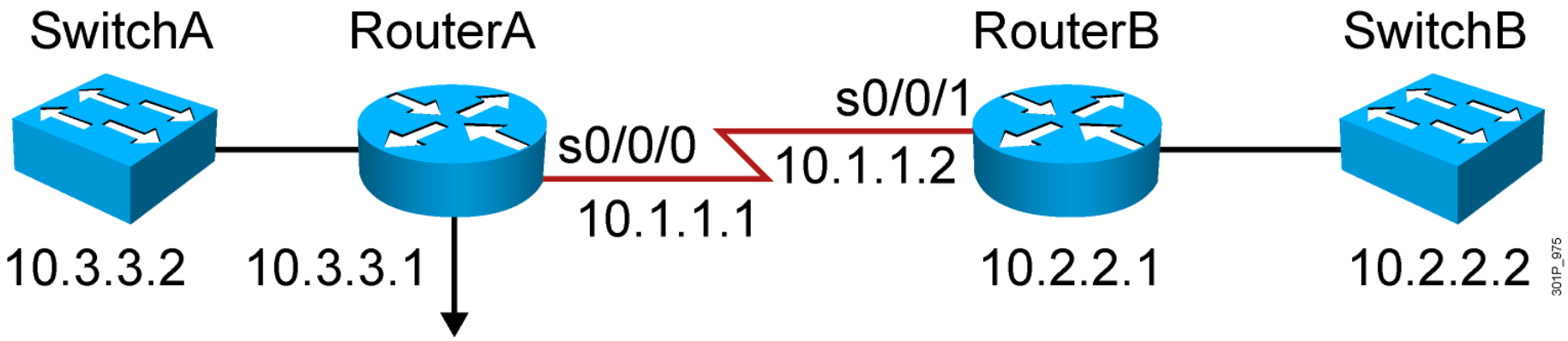
- **Cisco Discovery Protocol**
  - Cisco Layer 2 protocol
  - Has additional capabilities (VLAN or PoE negotiation)
  - Enabled by default
- **LLDP**
  - Standard-based Layer 2 protocol
  - Disabled by default
- Provides a summary of directly connected switches, routers, and other Cisco devices
- Discovers neighbor devices regardless of which protocol suite they are running

Using Cisco Discovery Protocol



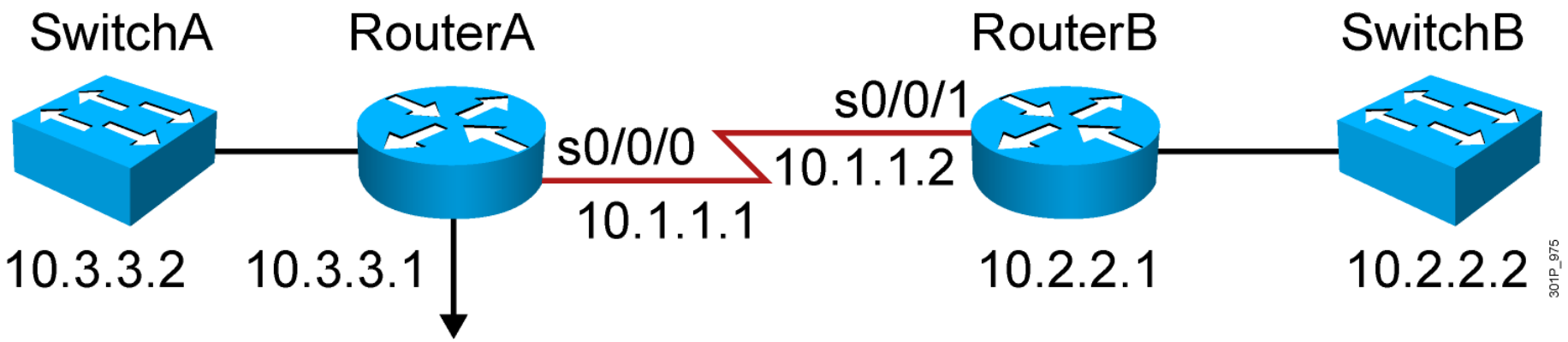

```
RouterA#show cdp ?
  entry       Information for specific neighbor entry
  interface   CDP interface status and configuration
  neighbors   CDP neighbor entries
  traffic     CDP statistics
  …
RouterA(config)#no cdp run
! Disable CDP Globally
RouterA(config)#interface serial0/0/0
RouterA(config-if)#no cdp enable
! Disable CDP on just this interface
```

Using the show cdp neighbors Command



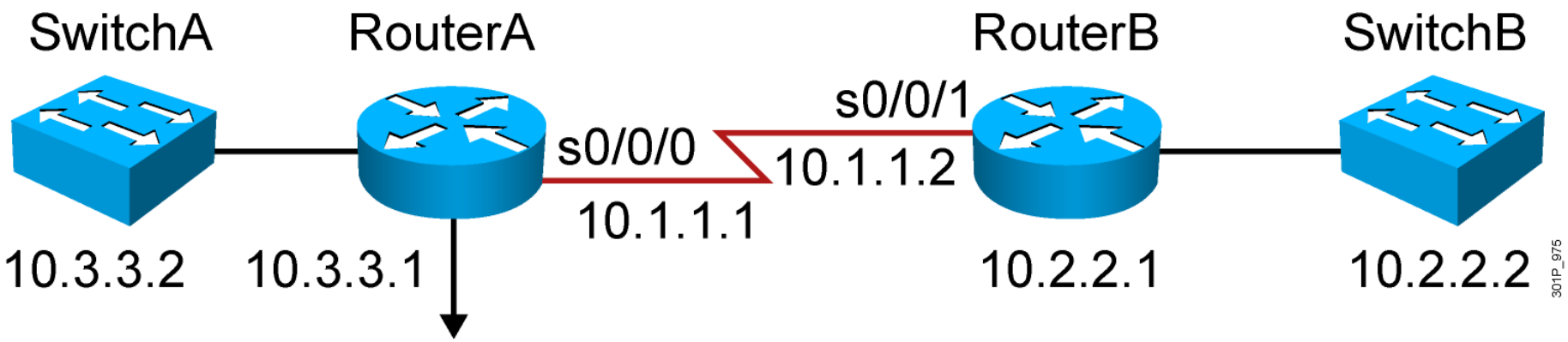

```
RouterA#show cdp neighbors
Capability Codes: R - Router, T - Trans Bridge, B - Source Route Bridge
                  S - Switch, H - Host, I - IGMP, r - Repeater

Device ID    Local Intrfce    Holdtme    Capability  Platform  Port ID
SwitchA          fa0/0          122          S I       WS-C2960- fa0/2
RouterB          s0/0/0         177        R S I       2811      s0/0/1
```

Using the show cdp entry Command




```
Device ID: RouterB
Entry address(es):
  IP address: 10.1.1.2
Platform: Cisco 2811,  Capabilities: Router Switch IGMP
Interface: Serial0/0/0,  Port ID (outgoing port): Serial0/0/1
Holdtime : 155 sec

Version :
Cisco IOS Software, 2800 Software (C2800NM-ADVIPSERVICESK9-M), Version
12.4(12), RELEASE SOFTWARE (fc1)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2006 by Cisco Systems, Inc.
Compiled Fri 17-Nov-06 12:02 by prod_rel_team
```

Additional Cisco Discovery Protocol Commands




```
RouterA#show cdp traffic
CDP counters :
        Total packets output: 8680, Input: 8678
        Hdr syntax: 0, Chksum error: 0, Encaps failed: 5
        No memory: 0, Invalid packet: 0, Fragmented: 0
        CDP version 1 advertisements output: 0, Input: 0
        CDP version 2 advertisements output: 8680, Input: 8678

RouterA#show cdp interface s0/0/0
Serial0/0/0 is up, line protocol is up
  Encapsulation PPP
  Sending CDP packets every 60 seconds
  Holdtime is 180 seconds
```

LLDP Configuration

```
switch(config)# [no] lldp run
switch(config-if)# [no] lldp enable
switch# show lldp neighbor [detail]
```

```
switch# show lldp neighbor
Capability codes:
    (R) Router, (B) Bridge, (T) Telephone, (C) DOCSIS Cable Device
    (W) WLAN Access Point, (P) Repeater, (S) Station, (O) Other
Device ID           Local Intf     Hold-time  Capability      Port
ID
c2960-8             Fa0/8          120        B               Fa0/8
Total entries displayed: 1
```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