CCNA

Cisco Router Challenge 1

Outline

This challenge involves the configuration of the E0 port on a router.

Objectives

The objectives of this challenge are to:

- Setup the IP address on E0 port.
- Setup the subnet mask on E0 port.
- Enable the E0 port.
- Set the description for the E0 port.
- Define the speed of the E0 port.
- Define duplex on the E0 port.
- Define a host table.

Example

```
> enable
# config t
(config)# hostname mars
mars (config)# ip domain-n ?
  WORD  Default domain name
mars (config)# ip domain-name fred.co
mars (config)# int e0
mars (config-if)# ?
Interface configuration commands:
  access-expression       Build a bridge boolean access expression
  arp                     Set arp type (arpa, probe, snap) or timeout
  backup                  Modify backup parameters
  bandwidth               Set bandwidth informational parameter
  bgp-policy              Apply policy propogated by bgp community string
  bridge-group            Transparent bridging interface parameters
  carrier-delay           Specify delay for interface transitions
  cdp                     CDP interface subcommands
  clns                    CLNS interface subcommands
  cmns                    OSI CMNS
  crypto                  Encryption/Decryption commands
  custom-queue-list       Assign a custom queue list to an interface
  dampening               Enable event dampening
  default                 Set a command to its defaults
  delay                   Specify interface throughput delay
  description             Interface specific description
```

```
  diffserv                diffserv (Provisioning)
  dot1q                   dot1q interface configuration commands
  dot1x                   Interface Config Commands for 802.1x
  duplex                  Configure duplex operation.
  exit                    Exit from interface configuration mode
  fair-queue              Enable Fair Queuing on an Interface
  flow-sampler            Attach flow sampler to the interface
  full-duplex             Configure full-duplex operational mode
  glbp                    Gateway Load Balancing Protocol interface commands
  half-duplex             Configure half-duplex and related commands
  help                    Description of the interactive help system
  hold-queue              Set hold queue depth
  ip                      Interface Internet Protocol config commands
  isis                    IS-IS commands
  iso-igrp                ISO-IGRP interface subcommands
  keepalive               Enable keepalive
  llc2                    LLC2 Interface Subcommands
  load-interval           Specify interval for load calculation for an
                          interface
  logging                 Configure logging for interface
  loopback                Configure internal loopback on an interface
  mac-address             Manually set interface MAC address
  max-reserved-bandwidth  Maximum Reservable Bandwidth on an Interface
  mls                     mls interface commands
  mop                     DEC MOP server commands
  mtu                     Set the interface Maximum Transmission Unit (MTU)
  netbios                 Use a defined NETBIOS access list or enable
                          name-caching
  no                      Negate a command or set its defaults
  ntp                     Configure NTP
  pagp                    PAgP interface subcommands
  pppoe                   pppoe interface subcommands
  pppoe-client            pppoe client
  priority-group          Assign a priority group to an interface
  random-detect           Enable Weighted Random Early Detection (WRED) on an
                          Interface
  rate-limit              Rate Limit
  roles                   Specify roles (by entering roles mode)
  service-policy          Configure QoS Service Policy
  shutdown                Shutdown the selected interface
  snapshot                Configure snapshot support on the interface
  snmp                    Modify SNMP interface parameters
  speed                   Configure speed operation.
  standby                 HSRP interface configuration commands
  tarp                    TARP interface subcommands
  timeout                 Define timeout values for this interface
  traffic-shape           Enable Traffic Shaping on an Interface or
                          Sub-Interface
  transmit-interface      Assign a transmit interface to a receive-only
                          interface
  trunk-group             Configure interface to be in a trunk group
  tx-ring-limit           Configure PA level transmit ring limit
  vlan-id                 Process VLAN-encapsulated packets with a specific
                          VLAN ID
  vlan-range              Process VLAN-encapsulated packets with a range of
                          VLAN IDs
  vrrp                    VRRP Interface configuration commands
mars (config-if)# ip address 36.109.222.1 255.255.255.128
mars (config-if)# no shutdown
mars (config-if)# description testing123
mars (config-if)# speed ?
  10    Force 10 Mbps operation
  100   Force 100 Mbps operation
```

```
  auto  Enable AUTO speed configuration
mars (config-if)# speed 10
mars (config-if)# duplex ?
  auto  Enable AUTO duplex configuration
  full  Force full duplex operation
  half  Force half-duplex operation
mars (config-if)# duplex half
mars (config-if)# exit
mars (config)# ip host ?
  WORD  Name of host
mars (config)# ip host oregon ?
  <0-65535>   Default telnet port number
  A.B.C.D     Host IP address
  additional  Append addresses
mars (config)# ip host oregon 200.150.174.6
mars (config)# ip host idaho 192.49.172.8
mars (config)# ip host montana 99.33.235.9
(config)# exit
# sh running
```

Cisco Router Challenge 2

Outline

This challenge involves the setting up the serial port parameters.

Objectives

The objectives of this challenge are to:

- Setup the IP address on S0 port.
- Setup the subnet mask on S0 port.
- Enable the S0 port.
- Set the description for the S0 port.
- Setup the IP address on S1 port.
- Setup the subnet mask on S1 port.
- Enable the S1 port.
- Set the description for the S1 port.

Example

```
> enable
# config t
(config)# int s0
(config-if)# ?
Interface configuration commands:
  access-expression           Build a bridge boolean access expression
  appletalk                   Appletalk interface subcommands
  arp                         Set arp type (arpa, probe, snap) or timeout
  autodetect                  Autodetect Encapsulations on Serial interface
  backup                      Modify backup parameters
  bandwidth                   Set bandwidth informational parameter
```

```
bridge-group                Transparent bridging interface parameters
carrier-delay               Specify delay for interface transitions
cdp                         CDP interface subcommands
clock                       Configure serial interface clock
compress                    Set serial interface for compression
custom-queue-list           Assign a custom queue list to an interface
dce-terminal-timing-enable  Enable DCE terminal timing
decnet                      Interface DECnet config commands
default                     Set a command to its defaults
delay                       Specify interface throughput delay
description                 Interface specific description
dialer                      Dial-on-demand routing (DDR) commands
dialer-group                Assign interface to dialer-list
down-when-looped            Force looped serial interface down
dxi                         ATM-DXI configuration commands
encapsulation               Set encapsulation type for an interface
exit                        Exit from interface configuration mode
fair-queue                  Enable Fair Queuing on an Interface
full-duplex                 Configure full-duplex operational mode
half-duplex                 Configure half-duplex and related commands
help                        Description of the interactive help system
hold-queue                  Set hold queue depth
idle-character              Set idle character type
ignore                      ignore signals
ignore-dcd                  ignore dcd
ignore-hw                   ignore a serial signal
invert                      Serial invert modes
ip                          Interface Internet Protocol config commands
ipx                         Novell/IPX interface subcommands
keepalive                   Enable keepalive
line-power                  Provide power on the line.
llc2                        LLC2 Interface Subcommands
load-interval               Specify interval for load calculation for an
                            interface
logging                     Configure logging for interface
loopback                    Configure internal loopback on an interface
mac-address                 Manually set interface MAC address
max-reserved-bandwidth      Maximum Reservable Bandwidth on an Interface
mop                         DEC MOP server commands
mtu                         Set the interface Maximum Transmission Unit (MTU)
multilink-group             Put interface in a multilink bundle
netbios                     Use a defined NETBIOS access list or enable
                            name-caching
network-clock-priority      Configure clock source priority
no                          Negate a command or set its defaults
nrzi-encoding               Enable use of NRZI encoding
ntp                         Configure NTP
physical-layer              Configure sync or async physical layer on serial
                            interface
ppp                         Point-to-Point Protocol
priority-group              Assign a priority group to an interface
pulse-time                  Force DTR low during resets
random-detect               Enable Weighted Random Early Detection (WRED) on
                            an Interface
rate-limit                  Rate Limit
serial                      serial interface commands
service-policy              Configure QoS Service Policy
shutdown                    Shutdown the selected interface
smds                        Modify SMDS parameters
smrp                        Simple Multicast Routing Protocol interface
                            subcommands
snapshot                    Configure snapshot support on the interface
snmp                        Modify SNMP interface parameters
```

```
  source                      Get config from another source
  timeout                     Define timeout values for this interface
  traffic-shape               Enable Traffic Shaping on an Interface or
                              Sub-Interface
  transmit-interface          Assign a transmit interface to a receive-only
                              interface
  transmitter-delay           Set dead-time after transmitting a datagram
  trunk-group                 Configure interface to be in a trunk group
  tx-ring-limit               Configure PA level transmit ring limit
(config-if)# ip address 160.52.39.9 255.248.0.0
(config-if)# no shutdown
(config-if)# description management
(config-if)# carrier-delay ?
  <0-60>  Carrier Transitions delay seconds
  msec    delay specified in milliseconds
(config-if)# carrier-delay 5
(config-if)# int s1
(config-if)# ip address 96.71.75.7 255.255.248.0
(config-if)# no shutdown
(config-if)# description production depart
(config-if)# carrier-delay 6
(config-if)# end
# sh running
```

Cisco Router Challenge 3

Outline

This challenge involves the configuration of the name server, user names and passwords.

Objectives

The objectives of this challenge are to:

- Setup the name server.
- Setup the privileged and executive password.
- Setup a username and password.

Example

```
> enable
# config t
(config)# ip name-server 51.16.207.1
(config)# ena ?
  last-resort  Define enable action if no TACACS servers respond
  password     Assign the privileged level password
  secret       Assign the privileged level secret
  use-tacacs   Use TACACS to check enable passwords
(config)# enable password default1
(config)# enable secret ankle
Router(config)# user bunty ?
  access-class         Restrict access by access-class
  autocommand          Automatically issue a command after the user logs in
  callback-dialstring  Callback dialstring
```

```
  callback-line        Associate a specific line with this callback
  callback-rotary      Associate a rotary group with this callback
  dnis                 Do not require password when obtained via DNIS
  nocallback-verify    Do not require authentication after callback
  noescape             Prevent the user from using an escape character
  nohangup             Do not disconnect after an automatic command
  nopassword           No password is required for the user to log in
  password             Specify the password for the user
  privilege            Set user privilege level
  secret               Specify the secret for the user
  user-maxlinks        Limit the user's number of inbound links
  view                 Set view name
  <cr>
(config)# username bunty password apple
(config)# exit
# sh running
```

Cisco Router Challenge 4

Outline

This challenge involves the configuration of the interface ports.

Objectives

The objectives of this challenge are to:

- Setup the domain name.
- Define the hostname.
- Enable the interface ports.

Example

```
> enable
# config t
(config)# ip domain-name work.org
(config)# hostname wyoming
wyoming (config)# int e0
wyoming (config-if)# no shutdown
wyoming (config-if)# int s0
wyoming (config-if)# no shutdown
wyoming (config-if)# int s1
wyoming (config-if)# no shutdown
(config)# exit
# sh running
```

Cisco Router Challenge 5

Outline

This challenge involves the configuration banners and the HTTP server.

Objectives

The objectives of this challenge are to:

- Define the hostname.
- Define the banners.
- Enable the HTTP server.

Example

```
> enable
# config t
(config)# hostname Amsterdam
amsterdam (config)# banner ?
  LINE            c banner-text c, where 'c' is a delimiting character
  exec            Set EXEC process creation banner
  incoming        Set incoming terminal line banner
  login           Set login banner
  motd            Set Message of the Day banner
  prompt-timeout  Set Message for login authentication timeout
  slip-ppp        Set Message for SLIP/PPP
amsterdam (config)# bann mo ?
  LINE  c banner-text c, where 'c' is a delimiting character
amsterdam (config)# banner motd my device
amsterdam (config)# banner login how are you
amsterdam (config)# banner exec main device
amsterdam (config)# ip http server
amsterdam (config)# ip http ?
  access-class        Restrict http server access by access-class
  authentication      Set http server authentication method
  client              Set http client parameters
  max-connections     Set maximum number of concurrent http server connections
  path                Set base path for HTML
  port                Set http server port
  secure-ciphersuite  Set http secure server ciphersuite
  secure-client-auth  Set http secure server with client authentication
  secure-port         Set http secure server port number for listening
  secure-server       Enable HTTP secure server
  secure-trustpoint   Set http secure server certificate trustpoint
  server              Enable http server
  timeout-policy      Set http server time-out policy parameters
(config)# exit
# sh running
```

Cisco Router Challenge 6

Outline

This challenge involves the configuration of RIP.

Objectives

The objectives of this challenge are to:

- Define RIP routing.
- Define the networks associated.
- Define CDP
- Define IP subnet zero.
- Define IP classless.

Example

```
> enable
# config t
(config)# router ?
  bgp       Border Gateway Protocol (BGP)
  eigrp     Enhanced Interior Gateway Routing Protocol (EIGRP)
  isis      ISO IS-IS
  iso-igrp  IGRP for OSI networks
  mobile    Mobile routes
  odr       On Demand stub Routes
  ospf      Open Shortest Path First (OSPF)
  rip       Routing Information Protocol (RIP)
(config)# router rip
(config-router)# ?
Router configuration commands:
  address-family          Enter Address Family command mode
  auto-summary            Enable automatic network number summarization
  default                 Set a command to its defaults
  default-information     Control distribution of default information
  default-metric          Set metric of redistributed routes
  distance                Define an administrative distance
  distribute-list         Filter networks in routing updates
  exit                    Exit from routing protocol configuration mode
  flash-update-threshold  Specify flash update threshold in second
  help                    Description of the interactive help system
  input-queue             Specify input queue depth
  maximum-paths           Forward packets over multiple paths
  neighbor                Specify a neighbor router
  network                 Enable routing on an IP network
  no                      Negate a command or set its defaults
  offset-list             Add or subtract offset from RIP metrics
  output-delay            Interpacket delay for RIP updates
  passive-interface       Suppress routing updates on an interface
  redistribute            Redistribute information from another routing
                          protocol
  timers                  Adjust routing timers
  traffic-share           How to compute traffic share over alternate paths
  validate-update-source  Perform sanity checks against source address of
                          routing updates
  version                 Set routing protocol version
(config-router)# version 2
(config-router)# network 166.248.0.0
(config-router)# network 200.169.96.0
(config-router)# network 137.205.232.0
(config-network)# exit
(config)# cdp ?
  advertise-v2      CDP sends version-2 advertisements
```

```
  holdtime          Specify the holdtime (in sec) to be sent in packets
  log               Log messages generated by CDP
  source-interface  Insert the interface's IP in all CDP packets
  timer             Specify the rate at which CDP packets are sent
(in sec)
  run
(config)# cdp run
(config)# int e0
(config)# int fa0/0
(config-if)# cdp ?
  enable  Enable CDP on interface
  log     Log messages generated by CDP
(config-if)# cdp enable
(config-if)# exit
(config)# ip subnet-zero
(config)# ip classless
(config)# exit
# sh running
```

Cisco Router Challenge 8

Outline

This challenge involves the setting of logging, the clock and HTTP settings.

Objectives

The objectives of this challenge are to:

- Setup logging.
- Define the clock.
- Define HTTP settings.

Example

```
> enable
# config t
(config)# logging ?
  Hostname or A.B.C.D  IP address of the logging host
  buffered             Set buffered logging parameters
  cns-events           Set CNS Event logging level
  console              Set console logging parameters
  count                Count every log message and timestamp last occurance
  exception            Limit size of exception flush output
  facility             Facility parameter for syslog messages
  history              Configure syslog history table
  host                 Set syslog server IP address and parameters
  monitor              Set terminal line (monitor) logging parameters
  on                   Enable logging to all supported destinations
  origin-id            Add origin ID to syslog messages
  rate-limit           Set messages per second limit
  reload               Set reload logging level
```

```
  server-arp           Enable sending ARP requests for syslog servers when
                       first configured
  source-interface     Specify interface for source address in logging
                       transactions
  trap                 Set syslog server logging level
(config)# logging on
(config)# logging 212.72.52.7
(config)# logging buffer 440240
(config)# logging host 138.24.170.8
(config)# logging trap emergency
(config)# logging monitor emergency
(config)# logging console emergency
(config)# logging buffer emergency
(config)# clock timezone AKDT
(config)# ip http ?
  access-class        Restrict http server access by access-class
  authentication      Set http server authentication method
  client              Set http client parameters
  max-connections     Set maximum number of concurrent http server connections
  path                Set base path for HTML
  port                Set http server port
  secure-ciphersuite  Set http secure server ciphersuite
  secure-client-auth  Set http secure server with client authentication
  secure-port         Set http secure server port number for listening
  secure-server       Enable HTTP secure server
  secure-trustpoint   Set http secure server certificate trustpoint
  server              Enable http server
  timeout-policy      Set http server time-out policy parameters
(config)# ip http server
(config)# ip http max-connections 7
(config)# ip http port 1024
(config)# exit
# sh running
```

Cisco Router Challenge 9

Outline

This challenge involves the configuration of CDP and the default gateway.

Objectives

The objectives of this challenge are to:

- Define CDP.

Example

```
> enable
# config t
(config)# ip default-gateway 139.35.119.5
(config)# cdp ?
  advertise-v2  CDP sends version-2 advertisements
  holdtime      Specify the holdtime (in sec) to be sent in packets
  timer         Specify the rate at which CDP packets are sent      (in sec)
  run
```

```
(config)# cdp run
(config)# cdp holdtime ?
  <10-255>  Length  of time  (in sec) that receiver must keep this packet
(config)# cdp timer ?
  <5-254>  Rate at which CDP packets are sent (in  sec)
(config)# cdp holdtime 4
(config)# cdp timer 89
(config)# int e0
(config-if)# cdp enable
(config-if)# end
(config)# line vty 0 15
(config-line)# login
(config)# end
# sh running
```

Cisco Router Challenge 10

Outline

This challenge involves the configuration of SNMP.

Objectives

The objectives of this challenge are to:

- Define the main parameters for the SNMP server.

Example

```
> enable
# config t
(config)# snmp-s ?
  chassis-id        String to uniquely identify this chassis
  community         Enable SNMP; set community string and access privs
  contact           Text for mib object sysContact
  context           Create/Delete a context apart from default
  drop              Silently drop SNMP packets
  enable            Enable SNMP Traps or Informs
  engineID          Configure a local or remote SNMPv3 engineID
  group             Define a User Security Model group
  host              Specify hosts to receive SNMP notifications
  ifindex           Enable ifindex persistence
  location          Text for mib object sysLocation
  packetsize        Largest SNMP packet size
  queue-length      Message queue length for each TRAP host
  system-shutdown   Enable use of the SNMP reload command
  tftp-server-list  Limit TFTP servers used via SNMP
  trap              SNMP trap options
  trap-source       Assign an interface for the source address of all traps
  trap-timeout      Set timeout for TRAP message retransmissions
  user              Define a user who can access the SNMP engine
  view              Define an SNMPv2 MIB view
(config)# smmp-server community annt RO
(config)# smmp-server contact steven
(config)# smmp-server location uk
(config)# smmp-server host 78.113.70.11
```

```
(config)# smmp-server enable traps
(config)# smmp-server chassis-ID paris
(config)# end
# sh running
```

Cisco Router Challenge 11

Outline

This challenge involves the configuration of the E0 port on a router.

Objectives

The objectives of this challenge are to:

- Setup the IP address on E0 port.
- Setup the subnet mask on E0 port.
- Enable the E0 port.
- Set the description for the E0 port.
- Define the speed of the E0 port.
- Define duplex on the E0 port.

Example

```
> enable
# config t
(config)# int s0
(config-if)# ip address 138.199.17.1 255.255.255.248
(config-if)# no shutdown
(config-if)# description students
(config-if)# encapsulation ?
  atm-dxi      ATM-DXI encapsulation
  frame-relay  Frame Relay networks
  hdlc         Serial HDLC synchronous
  lapb         LAPB (X.25 Level 2)
  ppp          Point-to-Point protocol
  smds         Switched Megabit Data Service (SMDS)
  x25          X.25
(config-if)# encapsulation ppp
(config-if)# ppp ?
  accm            Set initial Async Control Character Map
  acfc            Options for HDLC Address & Control Field Compression
  authentication  Set PPP link authentication method
  bridge          Enable PPP bridge translation
  chap            Set CHAP authentication parameters
  ipcp            Set IPCP negotiation options
  lcp             PPP LCP configuration
  link            Set miscellaneous link parameters
  max-bad-auth    Allow multiple authentication failures
  multilink       Make interface multilink capable
  pap             Set PAP authentication parameters
```

```
  pfc             Options for Protocol Field Compression
  quality         Set minimum Link Quality before link is down
  reliable-link   Use LAPB with PPP to provide a reliable link
  timeout         Set PPP timeout parameters
  use-tacacs      Use TACACS to verify PPP authentications
(config-if)# ppp authentication?
  chap     Challenge Handshake Authentication Protocol (CHAP)
  ms-chap  Microsoft Challenge Handshake Authentication Protocol (MS-CHAP)
  pap      Password Authentication Protocol (PAP)
(config-if)# ppp authentication chap
(config-if)# clock ?
  rate  Configure serial interface clock speed

(config-if)# clock rate ?
        Speed (bits per second)
  1200
  2400
  4800
  9600
  14400
  19200
  28800
  32000
  38400
  56000
  57600
  64000
  72000
  115200
  125000
  128000
  148000
  192000
  250000
  256000
  384000
  500000
  512000
  768000
  800000
  1000000
  1300000
  2000000
  4000000
  8000000

  <300-4000000>    Choose clockrate from list above
(config-if)# clock rate 56000
(config-if)# carrier-delay 8
(config-if)# bandwidth 198
(config-if)# no fair-queue
(config)# end
# sh running
```

Cisco Router Challenge 12

Outline

This challenge involves the configuration of the S1 port on a router.

Objectives

The objectives of this challenge are to:

- Setup the IP address on S1 port.
- Setup encapsulation on the S01port.
- Setup authentication on the S1 port.
- Define other S1 parameters.

Example

```
> enable
# config t
(config)# int s1
(config-if)# ip address 46.187.202.5 254.0.0.0
(config-if)# no shutdown
(config-if)# description academics
(config-if)# encapsulation ppp
(config-if)# ppp authentication pap
(config-if)# clock rate 56000
(config-if)# carrier-delay 2
(config-if)# bandwidth 63
(config-if)# no fair-queue
(config-if)# end
# sh running
```

Cisco Router Challenge 14

Outline

This challenge involves the configuration of the default-gateway and the hosts table.

Objectives

The objectives of this challenge are to:

- Setup the default gateway.
- Setup the hostname.
- Define a hosts table.

Example

```
> en
# config t
(config)# ip default-gateway 36.125.171.9
(config)# hostname montana
```

```
montana (config)# ip host tennessee 211.99.108.9
montana (config)# ip host kirkcaldy 154.242.2.8
montana (config)# ip host edinburgh 64.2.249.2
(config)# exit
# sh running
```

Cisco Router Challenge 15

Outline

This challenge involves the configuration of CON and VTY settings.

Objectives

The objectives of this challenge are to:

- Setup settings for CON.
- Setup setting for VTY.

Example

```
> en
# config t
(config)# line con ?
  <0-0>  First Line number
(config)# line con 0
(config-line)# pas ?
  0     Specifies an UNENCRYPTED password will follow
  7     Specifies a HIDDEN password will follow
  LINE  The UNENCRYPTED (cleartext) line password
(config-line)# password lothian
(config-line)# timeout ?
  login  Timeouts related to the login sequence
(config-line)#  timeout login ?
  response  Timeout for any user input during login sequences
(config-line)#  timeout login response ?
  <0-300>  Timeout in seconds
(config-line)#  timeout login response 19
(config-line)# exec-timeout ?
  <0-35791>  Timeout in minutes
(config-line)# exec-timeout 11
(config-line)# log
 synchronous  Synchronized message output
(config-line)# log synchronous
(config-line)# line vty 0 8
(config-line)# login
(config-line)# password mississippi
(config-line)# timeout login response 12
(config-line)# exec-timeout 10
(config-line)# exit
(config)# exit
# sh running
```

Cisco Router Challenge 16

Outline

This challenge involves the configuration of the boot and clock settings.

Objectives

The objectives of this challenge are to:

- Setup the local clock.
- Define different boot settings.

Example

```
# clock ?
  set  Set the time and date
# clock set 06:25
# config t
(config)# ip subnet-zero
(config)# ip classless
(config)# boot system ?
  WORD   TFTP filename or URL
  flash  Boot from flash memory
  mop    Boot from a Decnet MOP server
  rcp    Boot from a server via rcp
  tftp   Boot from a tftp server
(config)# boot system tftp c28.bin
(config)# ip dhcp ?
  conflict                   DHCP address conflict parameters
  database                   Configure DHCP database agents
  excluded-address           Prevent DHCP from assigning certain addresses
  limited-broadcast-address  Use all 1's broadcast address
  ping                       Specify ping parameters used by DHCP
  pool                       Configure DHCP address pools
  relay                      DHCP relay agent parameters
  smart-relay                Enable Smart Relay feature

(config)# ip dhcp pool ?
  WORD  Pool name
(config)# ip dhcp pool paris
(config-dhcp)# exit
(config)# aaa ?
  new-model  Enable NEW access control commands and functions.(Disables OLD
             commands.)
(config)# aaa new-model
```

Cisco Router Challenge 17

Outline

This challenge involves the configuration of a standard ACL.

Objectives

The objectives of this challenge are to:

- Setup a standard ACL.
- Setup an ACL to permit and deny a single host.
- Setup an ACL to permit and deny a single network.
- Setup an ACL to permit everything else.
- Apply it on the incoming port of E0.

Example

```
> en
# config t
(config)# access-list 2 permit host 130.152.162.10
(config)# access-list 2 deny host 193.68.36.8
(config)# access-list 2 permit 207.182.133.0 0.1.255.255
(config)# access-list 2 deny 153.246.194.0 0.0.127.255
(config)# access-list 2 permit any

(config)# int e0
(config-if)# ip access-group
(config-if)# ip access-group 2 in
```

Cisco Router Challenge 18

Outline

This challenge involves the configuration of a standard ACL.

Objectives

The objectives of this challenge are to:

- Setup a standard ACL.
- Setup an ACL to permit and deny a single host.
- Setup an ACL to permit and deny a single network.
- Setup an ACL to deny everything else.
- Apply it on the incoming port of S0.

Example

```
> en
# config t
(config)# access-list 2 permit host 130.152.162.10
```

```
(config)# access-list 2 deny host 193.68.36.8
(config)# access-list 2 permit 207.182.133.0 0.1.255.255
(config)# access-list 2 deny 153.246.194.0 0.0.127.255
(config)# access-list 2 deny any

(config)# int s0
(config-if)# ip access-group
(config-if)# ip access-group 2 in
```

Cisco Router Challenge 19

Outline

This challenge involves the configuration of an extended ACL.

Objectives

The objectives of this challenge are to:

- Define an extended ACL.
- Define a host to be allowed.
- Define a host to be denied.
- Define a network to be allowed.
- Define a network to be denied.
- Permit everything else.
- Apply ACL onto E0.

Example

```
> en
# config t
(config)# access-list 105 ?
  deny     Specify packets to reject
  dynamic  Specify a DYNAMIC list of PERMITs or DENYs
  permit   Specify packets to forward
  remark   Access list entry comment
(config)# access-list 105 permit ?
  <0-255>  An IP protocol number
  ahp      Authentication Header Protocol
  eigrp    Cisco's EIGRP routing protocol
  esp      Encapsulation Security Payload
  gre      Cisco's GRE tunneling
  icmp     Internet Control Message Protocol
  igmp     Internet Gateway Message Protocol
  igrp     Cisco's IGRP routing protocol
  ip       Any Internet Protocol
  ipinip   IP in IP tunneling
  nos      KA9Q NOS compatible IP over IP tunneling
  ospf     OSPF routing protocol
  pcp      Payload Compression Protocol
  pim      Protocol Independent Multicast
```

```
  tcp      Transmission Control Protocol
  udp      User Datagram Protocol
(config)# access-list 105 permit tcp host 208.89.101.4 host 41.153.91.2 eq ftp

(config)# access-list 105 deny tcp host 197.119.92.8 host 144.98.220.6 eq ftp

(config)#  access-list  105  permit  tcp  100.120.83.0  255.255.255.0  71.252.23.0
255.255.255.0 eq ftp

(config)#  access-list  105  deny  tcp  35.208.170.0  255.255.255.0  184.124.8.0
255.255.255.0 eq ftp

(config)# access-list 105 ?
  deny     Specify packets to reject
  dynamic  Specify a DYNAMIC list of PERMITs or DENYs
  permit   Specify packets to forward
  remark   Access list entry comment
 (config)# access-list 105 permit tcp
  A.B.C.D  Source address
  any      Any source host
  host     A single source host
 (config)# access-list 105 permit tcp any ?
  A.B.C.D  Destination address
  any      Any destination host
  eq       Match only packets on a given port number
  gt       Match only packets with a greater port number
  host     A single destination host
  lt       Match only packets with a lower port number
  neq      Match only packets not on a given port number
  range    Match only packets in the range of port numbers
(config)# access-list 105 permit tcp any any
(config)# int e0
(config-if)# ip access-group 105 in
```

Cisco Router Challenge 20

Outline

This challenge involves the configuration of named ACLs.

Objectives

The objectives of this challenge are to:

- Define a named standard ACL.
- Define a named extended ACL.

Example

```
> en
# config t
(config)# ip access-list ?
  extended    Extended Access List
  log-update  Control access list log updates
```

```
  logging     Control access list logging
  standard    Standard Access List
(config)# ip access-list standard
  <1-99>  Standard IP access-list number
  WORD    Access-list name
(config)# ip access-list standard leeds
(config-std-nacl)# deny ?
  Hostname or A.B.C.D  Address to match
  any                  Any source host
  host                 A single host address
(config-std-nacl)# deny host 193.34.245.4
(config-std-nacl)# permit host 16.21.50.10
(config-std-nacl)# deny 18.223.156.0 0.15.255.255
(config-std-nacl)# permit 139.32.80.0 0.15.255.255
(config-std-nacl)# exit
(config)# int s0
(config-if)# ip access-group
  <1-199>      IP access list (standard or extended)
  <1300-2699>  IP expanded access list (standard or extended)
  WORD         Access-list name
(config-if)# ip access-group leeds in
(config-if)# exit
(config)# ip access-list extended tennessee
(config-ext-nacl)# deny ?
  <0-255>  An IP protocol number
  ahp      Authentication Header Protocol
  eigrp    Cisco's EIGRP routing protocol
  esp      Encapsulation Security Payload
  gre      Cisco's GRE tunneling
  icmp     Internet Control Message Protocol
  igmp     Internet Gateway Message Protocol
  igrp     Cisco's IGRP routing protocol
  ip       Any Internet Protocol
  ipinip   IP in IP tunneling
  nos      KA9Q NOS compatible IP over IP tunneling
  ospf     OSPF routing protocol
  pcp      Payload Compression Protocol
  pim      Protocol Independent Multicast
  tcp      Transmission Control Protocol
  udp      User Datagram Protocol
(config-ext-nacl)# deny tcp host 198.89.74.1 host 208.177.41.6 eq telnet
(config-ext-nacl)# permit tcp host 205.198.245.6 host 202.226.135.3 eq telnet
(config-ext-nacl)#  deny  tcp  54.83.187.0  255.255.255.0  101.167.107.0  255.255.255.0
eq telnet
(config-ext-nacl)# permit tcp 56.248.48.0 255.255.255.0 138.236.218.0 255.255.255.0
eq telnet
(config-ext-nacl)# exit
(config)# int s1
(config-if)# ip access-group tennessee in
```

Cisco Router Challenge 51

Outline

This challenge involves getting rid of users.

Objectives

The objectives of this challenge are to:

- Remove users from the configuration.

Example

```
> en
# config t
# sh run
Building configuration...
Current configuration : 1380 bytes
!
version 12.0
service udp-small-servers
service tcp-small-servers
no ip subnet-zero
!
!
username fred password bert
username albert password ink
username martin password orange
!
no ip classless
no ip subnet-zero
!
interface ethernet 0
 shutdown
!
interface ethernet 1
 shutdown
!
interface serial 0
 --More------ press any key ---
 shutdown
!
interface serial 1
 shutdown
!
interface bri 0
 shutdown
!
!
ip host sun 192.168.1.1
ip host mars 10.0.0.1
ip host jupiter 172.10.1.1
cdp holdtime 120
cdp timer 60
!
end
(config)# no username fred password bert
(config)# no username albert password ant
(config)# no username martin password animal
(config)# no ip host sun
(config)# no ip host jupiter
(config)# no ip host mars
```

Cisco Router Challenge 52

Outline

This challenge involves getting rid of network configurations.

Objectives

The objectives of this challenge are to:

- Remove networks from RIP.

Example

```
> en
# sh run
Building configuration...
Current configuration : 1380 bytes
!
version 12.0
service udp-small-servers
service tcp-small-servers
no ip subnet-zero
!
no ip classless
no ip subnet-zero
!
interface ethernet 0
 shutdown
!
interface ethernet 1
 shutdown
!
interface serial 0
 shutdown
!
interface serial 1
 --More------ press any key ---
 shutdown
!
interface bri 0
 shutdown
!
!
router rip
 network 192.168.1.0
 network 10.0.0.0
 network 172.10.10.0
!
cdp holdtime 120
cdp timer 60
!
!
end
# config t
```

```
(config)# router rip
(config-router)# no network 192.168.1.0
(config-router)# no network 10.0.0.0
(config-router)# no network 172.10.10.0
```

Cisco Router Challenge 53

Outline

This challenge involves getting rid of the SNMP configurations

Objectives

The objectives of this challenge are to:

- Get rid of the SNMP-server configurations.

Example

```
> en
# sh run
Building configuration...
Current configuration : 1380 bytes
!
version 12.0
service udp-small-servers
service tcp-small-servers
no ip subnet-zero
!
!
snmp-server community annt ro
snmp-server contact steven
snmp-server location uk
snmp-server host 78.113.70.11
snmp-server enable traps
snmp-server chassis-ID paris
!
!
!
no ip classless
no ip subnet-zero
!
!
interface ethernet 0
 shutdown
!
interface ethernet 1
 --More------ press any key ---
 shutdown
!
interface serial 0
 shutdown
!
interface serial 1
 shutdown
```

```
!
interface bri 0
 shutdown
!
!
!
!
!
!
!
cdp holdtime 120
cdp timer 60
!
!
end
# config t
(config)# no snmp-server community annt RO
(config)# no snmp-server contact steven
(config)# no snmp-server location uk
(config)# no snmp-server host 78.113.70.11
(config)# no snmp-server enable traps
(config)# no snmp-server chassis-ID paris
```

Cisco Router Challenge 58

Outline

This is a test. Good luck!

Cisco Switch Challenge 1

Outline

This challenge involves the configuration an IP address on a VLAN

Objectives

The objectives of this challenge are to:

- Setup the VLAN address.
- Define a domain-name.
- Define the default gateway.

Example

```
> en
# config t
(config)# int vlan 1
(config-if)# ip address 148.183.229.5 255.255.248.0
(config-if)# exit
(config)# ip domain-name perthshire.cc
(config)# ip default-gateway 148.183.229.6
```

Cisco Switch Challenge 2

Outline

This challenge involves the configuration of the console password and to enable the HTTP server.

Objectives

The objectives of this challenge are to:

- Setup the console password.
- Enable the HTTP server.
- Define the HTTP port.
- Define the name server.

Example

```
> en
# config t
(config)# line con 0
(config-line)# password texas
(config-line)# exit
(config)# ip http server
(config)# ip http port 1024
(config)# cdp run
(config)# ip name-server 14.154.109.7
```

Cisco Switch Challenge 3

Outline

This challenge involves the configuration of the VTY server and SNMP settings

Objectives

The objectives of this challenge are to:

- Setup a password on the Telnet session.
- Define a username and password.
- Define SNMP parameters.

Example

```
# config t
(config)# line vty 0 15
(config-line)# login
(config-line)# password manchester
(config-line)# exit
(config)# username june password default1
(config)# snmp-server ?
  chassis-id        String to uniquely identify this chassis
  community         Enable SNMP; set community string and access privs
  contact           Text for mib object sysContact
  enable            Enable SNMP Traps or Informs
  engineID          Configure a local or remote SNMPv3 engineID
  group             Define a User Security Model group
  host              Specify hosts to receive SNMP notifications
  ifindex           Enable ifindex persistence
  inform            Configure SNMP Informs options
  location          Text for mib object sysLocation
  manager           Modify SNMP manager parameters
  packetsize        Largest SNMP packet size
  queue-length      Message queue length for each TRAP host
  system-shutdown   Enable use of the SNMP reload command
  tftp-server-list  Limit TFTP servers used via SNMP
  trap              SNMP trap options
  trap-source       Assign an interface for the source address of all traps
  trap-timeout      Set timeout for TRAP message retransmissions
  user              Define a user who can access the SNMP engine
  view              Define an SNMPv2 MIB view
(config)# snmp-server community popup
(config)# snmp-server contact june
(config)# snmp-server location glasgow
(config)# snmp-server ?
  chassis-id        String to uniquely identify this chassis
  community         Enable SNMP; set community string and access privs
  contact           Text for mib object sysContact
  enable            Enable SNMP Traps or Informs
  engineID          Configure a local or remote SNMPv3 engineID
  group             Define a User Security Model group
  host              Specify hosts to receive SNMP notifications
  ifindex           Enable ifindex persistence
  inform            Configure SNMP Informs options
  location          Text for mib object sysLocation
  manager           Modify SNMP manager parameters
  packetsize        Largest SNMP packet size
  queue-length      Message queue length for each TRAP host
  system-shutdown   Enable use of the SNMP reload command
  tftp-server-list  Limit TFTP servers used via SNMP
  trap              SNMP trap options
  trap-source       Assign an interface for the source address of all traps
  trap-timeout      Set timeout for TRAP message retransmissions
  user              Define a user who can access the SNMP engine
  view              Define an SNMPv2 MIB view
(config)# snmp-server enable ?
  informs  Enable SNMP Informs
```

```
  traps    Enable SNMP Traps
(config)# snmp-server enable traps
(config)# snmp-server chassis-id brighton
```

Cisco Switch Challenge 4

Outline

This challenge involves the configuration of a hosts table

Objectives

The objectives of this challenge are to:

- Define the default gateway.
- Enable an IP hosts table.

Example

```
# config t
Enter configuration commands, one per line.  End with CNTL/Z.
(config)# ip default-gateway 142.163.250.7

(config)# ip host ?
         WORD  Name of host
(config)# ip host brechin
  <0-65535>   Default telnet port number
  A.B.C.D     Host IP address
  additional  Append addresses
(config)# ip host brechin 209.250.181.10

(config)# ip host mississippi 208.194.196.5

(config)# ip host westvirginia 205.27.128.4
(config)# exit
# show hosts
```

Cisco Switch Challenge 5

Outline

This challenge involves the configuration of ethernet port settings and CDP.

Objectives

The objectives of this challenge are to:

- Setup a description on FA0/1.
- Setup a speed on FA0/1.
- Setup duplex on FA0/1.
- Define CDP details.

Example

```
# config t
Enter configuration commands, one per line.  End with CNTL/Z.
(config)# int fa0/1
(config-if)# no shutdown
(config-if)# description aironet 1200
(config-if)# speed 100
(config-if)# duplex full

(config-if)# int fa0/2
(config-if)# no shutdown
(config-if)# exit

(config)# cdp run

(config)# int fa0/1
(config-if)# cdp enable
(config-if)# exit

(config)# cdp ?
  advertise-v2  CDP sends version-2 advertisements
  holdtime      Specify the holdtime (in sec) to be sent in packets
  timer         Specify the rate at which CDP packets are sent (in sec)
  run
(config)# cdp timer ?
  <5-254>  Rate at which CDP packets are sent (in  sec)
(config)# cd holdtime ?
  <10-255>  Length  of time  (in sec) that receiver must keep this packet
(config)# cdp timer 89
(config)# cdp holdtime 41
```

Cisco Switch Challenge 6

Outline

This challenge involves the configuration of VLANs

Objectives

The objectives of this challenge are to:

- Setup VLAN 1, and define an IP address.
- Setup VLAN 2, and define an IP address.

The commands used are:

```
> en
# config t
(config)# int vlan 1
(config-if)# ip address 131.45.110.4 255.192.0.0
(config-if)# shutdown
(config)# vlan 1
(config-vlan)# name test
(config-vlan)# exit

(config)# int vlan 2
(config-if)# ip address 81.200.53.4 255.255.0.0
(config-if)# exit
(config)# vlan 2
(config-vlan)# name test2
(config-vlan)# exit
```

Or .. using the legacy method:

```
> en
# vlan database
(vlan)# vlan 1 name newjersey
 (vlan)# exit
# config t
(config)# int vlan 1
(config-if)# ip address 131.45.110.4 255.192.0.0
(config-if)# shutdown
(config-if)# exit
(config)# int vlan 2
(config-if)# ip address 81.200.53.4 255.255.0.0
(config-if)# exit
```

Example

```
> en
# config t
(config)# int vlan 1
(config-if)# ip address 131.45.110.4 255.192.0.0
(config-if)# shutdown
(config)# vlan 1
Switch(config-vlan)# ?
VLAN configuration commands:
  are           Maximum number of All Route Explorer hops for this VLAN (or
                zero if none specified)
  backupcrf     Backup CRF mode of the VLAN
  bridge        Bridging characteristics of the VLAN
  exit          Apply changes, bump revision number, and exit mode
  media         Media type of the VLAN
  mtu           VLAN Maximum Transmission Unit
  name          Ascii name of the VLAN
  no            Negate a command or set its defaults
  parent        ID number of the Parent VLAN of FDDI or Token Ring type VLANs
  private-vlan  Configure a private VLAN
  remote-span   Configure as Remote SPAN VLAN
  ring          Ring number of FDDI or Token Ring type VLANs
  said          IEEE 802.10 SAID
  shutdown      Shutdown VLAN switching
  state         Operational state of the VLAN
  ste           Maximum number of Spanning Tree Explorer hops for this VLAN (or
```

```
                zero if none specified)
  stp           Spanning tree characteristics of the VLAN
  tb-vlan1      ID number of the first translational VLAN for this VLAN (or
                zero if none)
  tb-vlan2      ID number of the second translational VLAN for this VLAN (or
                zero if none)
(config-vlan)# name ?
  WORD  The ascii name for the VLAN
(config-vlan)# name test
(config-vlan)# exit

(config)# int vlan 2
(config-if)# ip address 81.200.53.4 255.255.0.0
(config-if)# exit
(config)# vlan 2
(config-vlan)# name test2
(config-vlan)# exit
```

Or .. using the legacy method:

```
> en
# vlan database
(vlan)# vlan 1 name newjersey

       VLAN 1 added:

     Name: newjersey
(vlan)# vlan 2 name brighton

       VLAN 2 added:

     Name: brighton
(vlan)# exit
APPLY completed.
Exiting....
# config t
(config)# int vlan 1
(config-if)# ip address 131.45.110.4 255.192.0.0
(config-if)# shutdown
(config-if)# exit
(config)# int vlan 2
(config-if)# ip address 81.200.53.4 255.255.0.0
(config-if)# exit
```

Cisco Switch Challenge 7

Outline

This challenge involves the configuration of switchport access parameters.

Objectives

The objectives of this challenge are to:

- Setup VLAN 2.

- Define switchport access for VLAN 2.

Example

```
> en
# vlan database
(vlan)# vlan 2 name amsterdam

       VLAN 2 added:

     Name: amsterdam
(vlan)# exit
APPLY completed.
Exiting....
# config t
(config)# int vlan 2

(config-if)# ip address 161.161.238.9 255.255.255.248

(config-if)# exit
(config)# int fa0/2
(config-if)# switchport access ?
 vlan  Set VLAN when interface is in access mode
(config-if)# switchport access vlan 2

(config-if)# int fa0/5
(config-if)# switchport access vlan 2
```

Cisco Switch Challenge 8

Outline

This challenge involves the configuration of timeouts for the console.

Objectives

The objectives of this challenge are to:

- Setup a password on the console.
- Define timeouts for the console.

Example

```
> en
# config t
(config)# line con 0
(config-line)# password lothian
(config-line)#  timeout ?
  login  Timeouts related to the login sequence
(config-line)#  timeout login ?
  response  Timeout for any user input during login sequences
(config-line)#  timeout login response ?
```

```
  <0-300>  Timeout in seconds
(config-line)#  timeout login response 19
(config-line)# exec-timeout ?
  <0-35791>  Timeout in minutes
(config-line)# exec-timeout 11
(config-line)# log ?
 synchronous  Synchronized message output
(config-line)# log synchronous
(config-line)# line vty 0 8
(config-line)# login
(config-line)# password mississippi
(config-line)# timeout login response 12
(config-line)# exec-timeout 10
```

Cisco Router Test

Outline

This is a router test. Good luck!

Router Challenge 32

Outline

This challenge involves the configuration of Simple Network Time Protocol (SNTP).

Objectives

The objectives of this challenge are to:

- Setup SNTP to receive time updates from a specific server.
- Setup device to receive SNTP broadcasts.
- Set the system clock (this would not be required if an SNTP server is used, obviously).

Example

```
> enable
# config t
(config)# hostname amsterdam
amsterdam (config)# sntp server 192.168.1.100
amsterdam (config)# sntp broadcast client
amsterdam (config)# exit
amsterdam # clock set 05:44
amsterdam # show sntp
SNTP server     Stratum   Version    Last Receive
```

```
192.168.1.100      16        1        never

Broadcast client mode is enabled.
```

Router Challenge 125 (Filtering)

Outline: This challenge involves filtering the output of the show command.

Objectives: The objectives of this challenge are to outline the usage of the filtering of the output in the show command.

Explanation

The filtering output includes:

show "command" | **include** "word" this finds all lines with "word"
show "command" | **begin** "word" this finds all lines which begin with "word"
show "command" | **exclude** "word" this finds all lines without "word"

An example is:

```
# show running | include udp
# show running | include tcp
# show running | include !
# show running | begin version
# show running | exclude int
```

Router Challenge 126 (Filtering)

Outline: This challenge involves filtering the output of the show command.

Objectives: The objectives of this challenge are to outline the usage of the filtering of the output in the show command.

Explanation

The filtering output includes:

show "command" | **include** "word" this finds all lines with "word"
show "command" | **begin** "word" this finds all lines which begin with "word"
show "command" | **exclude** "word" this finds all lines without "word"

An example is:

```
# show version | include cisco
# show version | include product
# show version | include ver
# show version | begin power
# show version | exclude pca
```

Switch Challenge 39 (Filtering)

Outline: This challenge involves filtering the output of the show command.

Objectives: The objectives of this challenge are to outline the usage of the filtering of the output in the show command.

Explanation

The filtering output includes:

show "command" | **include** "word" this finds all lines with "word"
show "command" | **begin** "word" this finds all lines which begin with "word"
show "command" | **exclude** "word" this finds all lines without "word"

An example is:

```
# show running | include udp
# show running | include tcp
# show running | include !
# show running | begin version
# show running | exclude int
```

Switch Challenge 40 (Filtering)

Outline: This challenge involves filtering the output of the show command.

Objectives: The objectives of this challenge are to outline the usage of the filtering of the output in the show command.

Explanation

The filtering output includes:

show “command” | **include** “word” this finds all lines with “word”
show “command” | **begin** “word” this finds all lines which begin with “word”
show “command” | **exclude** “word” this finds all lines without “word”

An example is:

```
# show version | include cisco
# show version | include product
# show version | include ver
# show version | begin power
# show version | exclude pca
```