

# Switch Additional

## Cisco Switch Challenge 127

### Outline

This challenge involves setting up CNS.

### Objectives

The objectives of this challenge are to:

- Enable CNS.

### Example

```
> en
# config t
(config)# cn ?
  config          Configuration Agent
  event           Event Agent
  exec            Exec Agent
  id              Get CNS ID for CNS agents
  trusted-server  Trusted Server Configuration
(config)# cn ev ?
  WORD           Hostname or ip address of event gateway

(config)# cn ev 10.0.0.1 ?
<0-65535>       Event Gateway port number, default is 11011
  backup         Event Agent backup gateway
  encrypt        Enable Event Agent encryption
  failover-time  Seconds to wait for route to Primary after we already have
                 route to backup
  keepalive      Keepalive timeout retry_count
  source         bind socket to a source ip
  <cr>

(config)# cn ev 10.0.0.1 k ?
<0-65535>       timeout in seconds , default is 0

(config)# cn ev 10.0.0.1 k 120 ?
<0-65535>       retry count , default is 0

(config)# cn ev 10.0.0.1 k 120 10 ?
  failover-time  Seconds to wait for route to Primary after we already have
                 route to backup
```

```

<cr>
(config)# cns event 10.0.0.1 keepalive 120 10
(config)# cns config connect-intf serial ping-interval 1 retries 1
(config-cns-conn-if)# ?
CNS bootstrap configuration commands:
  config-cli  Connect interface config cli
  exit        Exit from connect interface config mode
  line-cli    line cli for configuring modem lines
(config-cns-conn-if)# config-cli ip address negotiated
(config-cns-conn-if)# config-cli encapsulation ppp
(config-cns-conn-if)# config-cli ip directed-broadcast
(config-cns-conn-if)# config-cli no keepalive
(config-cns-conn-if)# config-cli no shutdown
(config-cns-conn-if)# exit
(config)# cns id ?
  Async          Async interface
  BVI            Bridge-Group Virtual Interface
  Dialer        Dialer interface
  FastEthernet   FastEthernet IEEE 802.3
  GigabitEthernet GigabitEthernet IEEE 802.3z
  Group-Async    Async Group interface
  Lex           Lex interface
  Loopback      Loopback interface
  Multilink     Multilink-group interface
  Port-channel  Ethernet Channel of interfaces
  Tunnel        Tunnel interface
  Virtual-Template Virtual Template interface
  Virtual-TokenRing Virtual TokenRing
  Vlan          Catalyst Vlans
  hardware-serial Use hardware serial number as unique ID
  hostname      Use hostname as unique ID
  string        Use an arbitrary string as the unique ID
(config)# cns id FA0/1 ?
  dns-reverse  Use DNS reverse look up to assign the hostname
  ipaddress    Use IP address as unique ID
  mac-address  Use MAC address as unique ID
(config)# cns id FA0/1 ipaddress ?
  event  Set this ID as the event ID
<cr>
(config)# cns id FA0/1 ipaddress

```

# Cisco Switch Challenge 128

## Outline

This challenge involves setting up Web cache.

## Objectives

The objectives of this challenge are to:

- Enable Web-cache.
- Apply redirection on FA0/2 and FA0/3.

### Example

```

> en
Switch# config t
Switch(config)# ip wccp ?
  web-cache  Standard web caching service
Switch(config) # ip wccp web-cache ?
  password  Authentication password (key)
  <cr>
Switch(config)# ip wccp web-cache
Switch(config)# interface fastethernet0/1
Switch(config-if)# no switchport
Switch(config-if)# ip address 192.168.1.1 255.255.255.0
Switch(config-if)# no shutdown

Switch(config)# interface fastethernet0/2
Switch(config-if)# no switchport
Switch(config-if)# ip address 192.168.1.1 255.255.255.0
Switch(config-if)# no shutdown
Switch(config-if)# ip wccp ?
  web-cache  Standard web caching service

Switch(config-if)# ip wccp web-cache ?
  redirect   Set packet redirection options for the service

Switch(config-if)# ip wccp web-cache redirect ?
  in        Redirect to a Cache Engine appropriate inbound packets

Switch(config-if)# ip wccp web-cache redirect in ?
  <cr>
Switch(config-if)# ip wccp web-cache redirect in

```

### Explanation

The Web Cache Communication Protocol (WCCP) is used to configure the switch to redirect traffic to cache engines, which transparently store frequently accessed content and then deliver the cached version to the clients. WCCP is enabled on the switch with:

```
Switch(config)# ip wccp web-cache
```

Then on the interface Layer 3 access is defined with:

```
Switch(config-if)# no switchport
```

Then to redirect the traffic to the client engine:

```
Switch(config-if)# ip wccp web-cache redirect in
```

In this example the Web cache is connected to FA0/1, and web accesses are directed to this port.

## Cisco Switch Challenge 129

## Outline

This challenge involves setting up MSDP.

## Objectives

The objectives of this challenge are to:

- Enable MSDP.

## Example

```
> en
Switch# config t
Switch(config)# ip msdp ?
  cache-rejected-sa  Store rejected SAs from all peers
  cache-sa-state     Configure this system to cache SA state
  default-peer       Default MSDP peer to accept SA messages from
  description        Peer specific description
  filter-sa-request  Filter SA-Requests from peer
  keepalive          Configure keepalive parameters for a peer
  mesh-group         Configure an MSDP mesh-group
  originator-id      Configure MSDP Originator ID
  peer               Configure an MSDP peer
  redistribute       Inject multicast route entries into MSDP
  sa-filter          Filter SA messages from peer
  sa-limit           Configure SA limit for a peer
  shutdown           Administratively shutdown MSDP peer
  timer              MSDP timer
  ttl-threshold      Configure TTL Thresold for MSDP Peer
Switch(config)# ip msdp cache-sa-state ?
<cr>
Switch(config)# ip msdp cache-sa-state
Switch(config)# ip msdp filter-sa ?
  Hostname or A.B.C.D Peer name or address

Switch(config)# ip msdp filter-sa 1.2.3.4 ?
  list Access-list
  <cr>
Switch(config)# ip msdp filter-sa 1.2.3.4
```

# Cisco Switch Challenge 130

## Outline

This challenge involves the configuring MVR (Multicast VLAN Registration) which is used in applications that have a wide-scale deployment of multicast traffic over an Ethernet ring-

based service provider network. This is typical in broadcasting TV channels. With MVR subscribers can listen on multicast addresses on certain VLANs.

## Objectives

The objectives of this challenge are to:

- Define VLANs.
- Setup MVR

## Example

```
> enable
# config t
(config)# vlan 1
(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
  stp               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 edinburgh
(config-vlan)# no ?
  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
  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)# no shutdown
(config-vlan)# exit
(config)# int vlan 1
(config-if)# ip address 192.168.0.1 255.255.255.0
(config-if)# exit

(config)# mvr ?
  group        Configure a MVR multicast group
  mode         Configure MVR mode of operation
  querytime    Set MVR query response time
  vlan         Set MVR multicast VLAN
  <cr>
(config)# mvr
(config)# mvr group ?
  A.B.C.D      IP multicast address
(config)# mvr group 224.1.23.4
(config)# mvr querytime ?
  <1-100>      time value in units of 1/10 seconds
(config)# mvr querytime 5
(config)# mvr vlan ?
  <1-4094>     MVR Multicast VLAN id
(config)# mvr vlan 12
(config)# mv m ?
  compatible   Compatible Mode
  dynamic      Dynamic Mode
  <cr>
(config)# mvr mode dynamic

```

# Cisco Switch Challenge 131

## Outline

This challenge involves the setting up a bridge-group for fallback bridging (VLAN bridging) which fallback bridging, non-IP packets, that the switch does not route between VLAN bridge domains and routed ports, are forwarded.

## Objectives

The objectives of this challenge are to:

- Define a bridge-group.
- Apply it to FA0/2

## Example

```

> enable
# config t
Switch(config)# bridge ?
  <1-255>          Bridge Group number for Bridging.
  crb             Concurrent routing and bridging
  irb            Integrated routing and bridging
  mac-address-table  MAC-address table configuration commands
Switch(config)# bridge 10 ?
  acquire          Dynamically learn new, unconfigured stations
  address          Block or forward a particular Ethernet address
  aging-time       Set forwarding entry aging time
  bitswap-layer3-addresses  Bitswap embedded layer 3 MAC addresses
  bridge           Specify a protocol to be bridged in this bridge
                  group
  circuit-group    Circuit-group
  domain           Establish multiple bridging domains
  forward-time     Set forwarding delay time
  hello-time       Set interval between HELLOs
  lat-service-filtering  Perform LAT service filtering
  max-age          Maximum allowed message age of received Hello
BPDU
  priority         Set bridge priority
  protocol         Specify spanning tree protocol
  route           Specify a protocol to be routed in this bridge
                  group
  subscriber-policy  Subscriber group bridging
Switch(config)# bridge 10 protocol vlan-bridge
Switch(config)# bridge 10 aging-time ?
  <10-1000000>    Seconds
Switch(config)# bridge 10 aging-time 20
Switch(config)# bridge 10 hello-time 20
Switch(config)# bridge 10 forward-time 20
Switch(config)# bridge 10 max-age 10
Switch(config)# bridge 10 priority ?
  <0-65535>      Priority (low priority more likely to be root)
Switch(config)# bridge 10 priority 10
Switch(config)# interface fa0/1
Switch(config-if)# no switchport
Switch(config-if)# no shutdown
Switch(config-if)# bridge-group ?
  <1-255>        Assign an interface to a Bridge Group.

Switch(config-if)# bridge-group 10 ?
  <cr>
  circuit-group    Associate serial interface with a circuit group
  input-address-list  Filter packets by source address
  input-lat-service-deny  Deny input LAT service advertisements matching a
                        group list
  input-lat-service-permit  Permit input LAT service advertisements matching a
                        group list
  input-lsap-list  Filter incoming IEEE 802.3 encapsulated packets
  input-type-list  Filter incoming Ethernet packets by type code
  lat-compression  Enable LAT compression over serial or ATM
                  interfaces
  output-address-list  Filter packets by destination address
  output-lat-service-deny  Deny output LAT service advertisements matching a
                        group list
  output-lat-service-permit  Permit output LAT service advertisements matching
                        a group list
  output-lsap-list  Filter outgoing IEEE 802.3 encapsulated packets

```

output-type-list	Filter outgoing Ethernet packets by type code
port-protected	There will be no traffic between this interface and other protected
subscriber-loop-control	Configure subscriber loop control
port interface in	this bridge group
block-unknown-source	block traffic which come from unknown source MAC address
input-pattern-list	Filter input with a pattern list
output-pattern-list	Filter output with a pattern list
path-cost	Set interface path cost
priority	Set interface priority
source-learning	learn source MAC address
spanning-disabled	Disable spanning tree on a bridge group
unicast-flooding	flood packets with unknown unicast destination MAC addresses

```
Switch(config-if)# bridge-group 10
Switch(config-if)# bridge-group 10 path-cost ?
<0-65535> Path cost (higher values are higher costs)
Switch(config-if)# bridge-group 10 path-cost 10
Switch(config-if)# bridge-group 10 spanning-disable
```

## Cisco Switch Challenge 132

**Area:** Switches – DHCP Reforwarding

### Outline

This challenge involves defining DHCP reforwarding

### Objectives

The objectives of this challenge are to:

- Define DHCP reforwarding.

The commands used are:

```
> enable
# config t
(config)# service dhcp
(config)# ip dhcp relay information option
(config)# ip dhcp relay information policy drop
```

### Example

```
> enable
# config t
(config)# service ?
  compress-config  Compress the configuration file
  config          TFTP load config files
  dhcp           Enable DHCP server and relay agent
```

```

disable-ip-fast-frag  Disable IP particle-based fast fragmentation
exec-callback         Enable exec callback
exec-wait             Delay EXEC startup on noisy lines
finger               Allow responses to finger requests
hide-telnet-addresses Hide destination addresses in telnet command
linenumber           enable line number banner for each exec
nagle                Enable Nagle's congestion control algorithm
old-slip-prompts     Allow old scripts to operate with slip/ppp
pad                  Enable PAD commands
password-encryption  Encrypt system passwords
prompt              Enable mode specific prompt
pt-vty-logging       Log significant VTY-Async events
sequence-numbers     Stamp logger messages with a sequence number
slave-log            Enable log capability of slave IPs
tcp-keepalives-in    Generate keepalives on idle incoming network
                    connections
tcp-keepalives-out   Generate keepalives on idle outgoing network
                    connections
tcp-small-servers    Enable small TCP servers (e.g., ECHO)
telnet-zeroidle      Set TCP window 0 when connection is idle
timestamps           Timestamp debug/log messages
udp-small-servers    Enable small UDP servers (e.g., ECHO)

```

**(config)# service dhcp**

**(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
snoooping           DHCP Snooping

```

**(config)# ip dhcp relay ?**

```

forward             Enable forwarding DHCP broadcasts
information         Relay agent information option

```

**(config)# ip dhcp relay information ?**

```

check              Validate relay information in BOOTREPLY
option             Insert relay information in BOOTREQUEST
policy             Define reforwarding policy
trust-all         Received DHCP packets may contain relay info option with zero
                    giaddr

```

**(config)# ip dhcp relay information option ?**

<cr>

**(config)# ip dhcp relay information option**

**(config)# ip dhcp relay information policy ?**

```

drop              Do not forward BOOTREQUEST message with existing information
keep              Leave existing information alone
replace           Replace existing information

```

**(config)# ip dhcp relay information policy drop**

## Cisco Switch Challenge 133

Area: Switches – Static MAC setup

## Outline

MAC address notification allows the tracking of MAC address activity through SNMP using a trap which sends information to an SNMP server when there is activity. The trap interval defines the time that the updates will be send to the SNMP server which can reduce network traffic when there are a great deal of MAC address activity.

## Objectives

The objectives of this challenge are to:

- Define static MAC addresses.

The commands used are:

```
# config t
(config)# mac address-table static 1.1.1 vlan 1 interface fa0/1
(config)# mac address-table static 1.1.2 vlan 1 interface fa0/2
```

## Example

```
# config t
(config)# mac add ?
aging-time      Set MAC address table entry maximum age
notification    Enable/Disable MAC Notification on the switch
static          static keyword

(config)# mac add s ?
H.H.H 48 bit mac address

(config)# mac add s 1.1.1 ?
vlan VLAN keyword

(config)# mac add s 1.1.1 v ?
<1-4094> VLAN id of mac address table

(config)# mac add s 1.1.1 v 1 ?
drop           drop frames
interface      interface

Switch(config)# mac add s 1.1.1 v 1 interface ?
FastEthernet   FastEthernet IEEE 802.3
GigabitEthernet GigabitEthernet IEEE 802.3z
Port-channel   Ethernet Channel of interfaces

(config)# mac address-table static 1.1.1 vlan 1 interface fa0/1
(config)# mac address-table static 1.1.2 vlan 1 interface fa0/2

# sh mac address-table static
Mac Address Table
-----
```

Vlan	Mac Address	Type	Ports
----	-----	-----	-----
All	0012.00b0.2780	STATIC	CPU
All	0012.00b0.2781	STATIC	CPU
All	0012.00b0.2782	STATIC	CPU
All	0012.00b0.2783	STATIC	CPU
All	0012.00b0.2784	STATIC	CPU
All	0012.00b0.2785	STATIC	CPU
All	0012.00b0.2786	STATIC	CPU
All	0012.00b0.2787	STATIC	CPU
All	0012.00b0.2788	STATIC	CPU
All	0012.00b0.2789	STATIC	CPU
All	0012.00b0.278a	STATIC	CPU
All	0012.00b0.278b	STATIC	CPU
All	0012.00b0.278c	STATIC	CPU
All	0012.00b0.278d	STATIC	CPU
All	0012.00b0.278e	STATIC	CPU
All	0012.00b0.278f	STATIC	CPU
All	0012.00b0.2790	STATIC	CPU
All	0012.00b0.2791	STATIC	CPU
All	0012.00b0.2792	STATIC	CPU
All	0012.00b0.2793	STATIC	CPU
All	0012.00b0.2794	STATIC	CPU
All	0012.00b0.2795	STATIC	CPU
All	0012.00b0.2796	STATIC	CPU
All	0012.00b0.2797	STATIC	CPU
All	0012.00b0.2798	STATIC	CPU
All	0012.00b0.2799	STATIC	CPU
All	0012.00b0.279a	STATIC	CPU
All	0100.0c00.0000	STATIC	CPU
All	0100.0ccc.cccc	STATIC	CPU
All	0100.0ccc.cccd	STATIC	CPU
All	0100.0ccd.cdce	STATIC	CPU
All	0180.c200.0000	STATIC	CPU
All	0180.c200.0001	STATIC	CPU
All	0180.c200.0002	STATIC	CPU
All	0180.c200.0003	STATIC	CPU
All	0180.c200.0004	STATIC	CPU
All	0180.c200.0005	STATIC	CPU
All	0180.c200.0006	STATIC	CPU
All	0180.c200.0007	STATIC	CPU
All	0180.c200.0008	STATIC	CPU
All	0180.c200.0009	STATIC	CPU
All	0180.c200.000a	STATIC	CPU
All	0180.c200.000b	STATIC	CPU
All	0180.c200.000c	STATIC	CPU
All	0180.c200.000d	STATIC	CPU
All	0180.c200.000e	STATIC	CPU
All	0180.c200.000f	STATIC	CPU
All	0180.c200.0010	STATIC	CPU

Total Mac Addresses for this criterion: 48

## Cisco Switch Challenge 134

**Area:** Switches – SDR (Session Announcement Protocol (SAP) designated router) listener

### Outline

This challenge defines setting up an SDR listening on the switch.

## Objectives

The objectives of this challenge are to:

- Define SDR cache timeout.
- Define SRD listener on an interface.

The commands used are:

```
# config t
(config)# ip sdr cache-timeout 10

(config)# int fa0/1
(config-if)# no switchport
(config-if)# ip sdr listen
(config)# int fa0/2
(config-if)# no switchport
(config-if)# ip sdr listen
(config)# int fa0/3
(config-if)# no switchport
(config-if)# ip sdr listen
```

## Notes

```
# config t
(config)# ip sdr ?
  cache-timeout  Timeout period for entries
(config)#ip sdr cache-timeout ?
  <1-4294967295>  Timeout in minutes
(config)#ip sdr cache-timeout 10 ?
  <cr>
(config)#ip sdr cache-timeout 10

(config)# int fa0/1
(config-if)# no switchport
(config-if)# ip ?
Interface IP configuration subcommands:
  access-group      Specify access control for packets
  accounting        Enable IP accounting on this interface
  address           Set the IP address of an interface
  authentication    authentication subcommands
  bandwidth-percent Set EIGRP bandwidth limit
  bgp               BGP interface commands
  broadcast-address Set the broadcast address of an interface
  cef               Cisco Express Forwarding interface commands
  cgmp              Enable/disable CGMP
  dhcp              Configure DHCP parameters for this interface
  directed-broadcast Enable forwarding of directed broadcasts
  dvmrp             DVMRP interface commands
  hello-interval    Configures IP-EIGRP hello interval
  helper-address    Specify a destination address for UDP broadcasts
  hold-time         Configures IP-EIGRP hold time
  igmp              IGMP interface commands
  irdp              ICMP Router Discovery Protocol
  load-sharing      Style of load sharing
  local-proxy-arp   Enable local-proxy ARP
```

```

mask-reply      Enable sending ICMP Mask Reply messages
mrm             Configure IP Multicast Routing Monitor tester
mrout-cache    Enable switching cache for incoming multicast packets
mtu            Set IP Maximum Transmission Unit
multicast      IP multicast interface commands
ospf           OSPF interface commands
pim            PIM interface commands
policy         Enable policy routing
probe          Enable HP Probe support
proxy-arp      Enable proxy ARP
rarp-server    Enable RARP server for static arp entries
redirects      Enable sending ICMP Redirect messages
rgmp           Enable/disable RGMP
rip            Router Information Protocol
route-cache    Enable fast-switching cache for outgoing packets
sap            Session Advertisement Protocol interface commands
sdr            Session Directory Protocol interface commands
security       DDN IP Security Option
split-horizon  Perform split horizon
summary-address Perform address summarization
unnumbered     Enable IP processing without an explicit address
unreachables   Enable sending ICMP Unreachable messages
urd            Configure URL Rendezvousing
vrf            VPN Routing/Forwarding parameters on the interface
wccp          WCCP interface commands
(config-if)# ip cgmp ?
  proxy        CGMP for hosts and proxy for multicast routers
  router-only  CGMP proxy for multicast routers only
  <cr>
(config-if)# ip cgmp
(config)# int fa0/2
(config-if)# no switchport
(config-if)# ip cgmp proxy
(config)# int fa0/3
(config-if)# no switchport
(config-if)# ip cgmp router-only

```