Chapter 2: VLANs

vlan [vlan-id]
name [vlan-name]

switchport mode access
switchport access vlan [vlan-id]
no switchport access vlan
show vlan summary

switchport mode trunk
switchport trunk [allowed / native] vlan [vlan-id]
no switchport trunk [allowed / native] vlan

switchport nonegotiate
switchport mode dynamic [auto / desirable]

show dtp interface [interface]
show interfaces trunk

Chapter 3: Inter-VLAN Routing

interface [interface].[subinterface]
encapsulation dot1q [subinterface]

show ip route
[ping / tracert] [ip-address]

Chapter 5: EtherChannel

int range [interfaces]
channel-group [group_num] mode [on/desirable/auto] (pagp)
channel-group [group_num] mode [on/active/passive] (lacp)
int port-channel [group_num]
switchport mode trunk
switchport trunk allowed vlan [vlan-id]

show interfaces port-channel
show etherchannel summary
show etherchannel port-channel
show interfaces etherchannel

no interface port-channel [group_num]

interface [interface]
duplex [half / full]

Chapter 6: FHRP

interface [interface]
standby version 2
standby [group-num] ip [virtual-ip-address]
standby [group-num] priority [priority]
[no] standby [group-num] preempt

Chapter 7: Routing Concepts

show ip route
show ip eigrp neighbors
show ip protocols

router eigrp [AS-number]
eigrp router-id [ipv4-address]
network [ipv4-address] [wildcard-mask]
passive-interface [interface]
no auto-summary

no switchport
ip route 0.0.0.0 0.0.0.0 [interface]
redistribute static

Chapter 8: LAN Security Concepts

line vty 0 4
password [password]
login

ip domain-name [domain]
crypto key generate rsa general-keys modulus [bits]
username [username] secret [password]
ip ssh version 2
line vty 0 4
transport input ssh
login local

Chapter 9: Switch Security Configuration

interface [interface]
switchport port-security
switchport port-security maximum [number]

switchport port-security mac-address [mac-address / sticky]
switchport port-security aging [time / type] [inactivity_min / [absolute / inactivity]]
switchport port-security violation [shutdown / restrict / protect]

show port-security interface [interface]

ip dhcp snooping
interface [interface]
ip dhcp snooping trust

interface [interface]
ip dhcp snooping limit rate [packets-per-second]
ip dhcp snooping vlan [vlan-id]

show ip dhcp snooping
show ip dhcp snooping binding

ip arp inspection vlan [vlan-id]
interface [interface]
ip arp inspection trust
ip arp inspection validate [src-mac / dst-mac / ip]

spanning-tree portfast default

interface [interface]
switchport mode access
spanning-tree portfast
show spanning-tree summary

spanning-tree portfast bpduguard default

interface [interface]
spanning-tree bpduguard enable

Extra

ip domain name [domain]
no ip domain-lookup
hostname [hostname]

security passwords min-length [length]
line [console 0 / vty 0 4]
password [password]
exec-timeout [inactivity-min] 0
login

login block-for [sec-not-allowed] attempts [attempt] within [within-sec]
service password-encryption
enable secret class
banner motd #[message]#

clock set [hour:min:sec] [day month year]

copy running-config startup-config

ipv6 unicast-routing
ipv6 address [ipv6-address / link-local-address] [- / link-local]

int [interface]
clock rate [clock rate]

```
!R1 Basic Config
en
conf t
hostname R1
ip domain name ccna-lab.com
no ip domain lookup
!skip:
service password-encryption
security passwords min-length 12
!
!can create many *secret cannot see, *password can see
username SSHadmin password Admin123
username PC3 password Admin123
username PC4 password Admin123
en secret cisco
crypto key generate rsa modulus 1024
!--ssh version2

!Console + VTY
line con 0
password class
exec-timeout 4 0
login
line vty 0 4
password cisco
exec-timeout 4 0
transport input ssh
login local

banner motd $ Authorized Users Only ! $
login block-for 120 attempts 3 within 60

!ipv4
ip routing

!IPv6 en
ipv6 unicast-routing

en
conf t
hostname R1

!S1
en
```

```
conf t
hostname S1
no ip domain-lookup

!S2
en
conf t
hostname S2
no ip domain-lookup

!vlan
!S1 & S2
vlan 3
name Management
vlan 4
name Operations
vlan 7
name ParkingLot
vlan 8
name Native

!S1
int vlan 3
ip add 192.168.3.11 255.255.255.0
no shut
exit
ip default-gateway 192.168.3.1
int range f0/2-4, f0/7-24, g0/1-2
sw m a
sw a vlan 7
shut
int f0/6
sw m a
sw a vlan 3

!S2
int vlan 3
ip add 192.168.3.12 255.255.255.0
no shut
exit
ip default-gateway 192.168.3.1
interface range f0/2 - 17, f0/19 - 24 , g0/1 - 2
sw m a
sw a vlan 7
```

```
shut
int f0/18
sw m a
sw a vlan 4

show vlan brief

!802.1Q
!S1S2
int f0/1
sw m t
sw t native vlan 8
sw t a vlan 3,4,8

show interfaces trunk

do wr

!S1
int f0/5
sw m t
sw t n vlan 8
sw t a vlan 3,4,8
do wr

!R1
en
conf t
int g0/0/1
no shut
exit

int g0/0/1.3
description Management Network
encapsulation dot1q 3
ip add 192.168.3.1 255.255.255.0
interface g0/0/1.4
description Operations Network
encapsulation dot1q 4
ip add 192.168.4.1 255.255.255.0
int g0/0/1.8
description Native VLAN
encapsulation dot1q 8 native
```

1. Router
1 vlan = 1 subinterface
int g0/0/1.3
encapsulation dot1q 3 (remove header??)
ip add 192.168.3.1 255.255.255.0
…
int g0/0/1
no shut

2. Switch
the port that connected to router must be a trunk

—
Before HSRP:
PC-A uses R1 as gateway.
PC-B uses R3 as gateway.
If a router fails → affected PC loses connectivity.

After HSRP:
Both PCs use 192.168.1.254.
If R1 fails → R3 takes over.
Connectivity is automatically restored.

What Happens When a Router Fails?
R1 goes down → HSRP detects failure after 10 seconds (hold time).
R3 becomes active and starts replying as 192.168.1.254.
Hosts don't notice — they continue sending traffic to the virtual IP.
If preempt is enabled on R1:
When R1 comes back, it automatically reclaims the active role.
If preempt is not enabled:
R3 remains active until it fails.
---
1. Design VR
2. Assign VR IP
3. end devices - use vr as gateway
4. VR as gw

Packet Tracer - HSRP Configuration Guide
!Router R1
en
conf t
int g0/1

```
 standby version 2
!vr ip
 standby 1 ip 192.168.1.254
!higher =active
 standby 1 priority 150
!auto reclaim if R1 recovers
 standby 1 preempt

!Router R3
en
conf t
 int g0/0
 standby version 2
!same vr ip
 standby 1 ip 192.168.1.254

!Switch S1
en
conf t
ip default-gateway 192.168.1.254

!Switch S3
en
conf t
ip default-gateway 192.168.1.254
```

—----------

PAgP → desirable ↔ auto

LACP → active ↔ passive

Always configure same speed/duplex/VLAN mode on all links.