CCNA COMMANDS

Command	Mode	Description
01 CISCO CLI AND PLATFORM INTRODUCTION		
`?`	Any Mode	Context sensitive help. Use the **?** to see command options in the present mode
`sh?`	Any Mode	Command search. Use the **?** with a prefix to see commands with that prefix
`sh<TAB>`	Any EXEC	Pressing TAB with any valid abbreviated command auto-fills the command
`configure terminal`	Priv EXEC	Changes the administration mode from PRIV EXEC to GLOBAL CONFIGURATION mode
`enable`	User EXEC	Changes the administration mode from USER EXEC to PRIV EXEC mode
`disable`	Priv EXEC	Returns from PRIV EXEC back down to USER EXEC mode
`exit`	Any Config	Moves back one level in the configuration hierarchy; from Global Config it leaves to EXEC
`end`	Any Config	Returns straight to PRIV EXEC from any configuration mode. **Ctrl-Z** does the same
`do COMMAND`	Any Config	Runs a PRIV EXEC command - **show**, **ping**, **copy** - without leaving configuration mode
`show running-config`	Priv EXEC	Displays the current active configuration running in RAM to the terminal window
`show startup-config`	Priv EXEC	Displays the current bootup configuration stored in NVRAM to the terminal window
`show version`	Priv EXEC	Displays RAM, flash memory, hardware, serial, model, bootstrap, IOS version, last reboot
`show history`	User EXEC	Displays the commands held in this session's history buffer
`terminal length <0-512>`	User EXEC	Lines per screen for this session. **0** disables the --More-- pager for a long capture
`terminal monitor`	Priv EXEC	Sends console log messages to the current telnet or SSH session
`logging synchronous`	Line Config	Reprints what you were typing after a log message interrupts the line
`exec-timeout <0-35791> [<0-2147483>]`	Line Config	Idle minutes and seconds before the line is disconnected. **0 0** never times out
`no ip domain-lookup`	Global Config	Stops the device treating a mistyped command as a hostname and stalling on a DNS lookup
`banner motd DELIMITER`	Global Config	Message of the day, shown before login and ended by the chosen delimiter character
02 SECURING THE PLATFORM		
`enable password`	Global Config	A deprecated option for establishing a priv EXEC password (unencrypted option)
`enable secret`	Global Config	Preferred option for establishing a priv EXEC password (automatically MD5 encrypted)
`line [con|aux|vty] <0-15>`	Global Config	Enter line configuration mode to configure Console 0, Auxiliary 0 or VTY 0 through 15
`password PASSWORD`	Line Config	Set an unencrypted password for users connecting to the Console, Auxiliary or VTY port
`login`	Line Config	Enforces the requirement to authenticate when connecting to the Console, Auxiliary, VTY
`login local`	Line Config	Configures authentication to vty, console and auxiliary using the local usernames
`service password-encryption`	Global Config	Encrypts clear text passwords in the configuration using a level 7 encryption (not secure)
`security passwords min-length <0-16>`	Global Config	Minimum length accepted for any new password configured on the device
`login block-for SEC attempts N within SEC`	Global Config	Refuses logins for a period after N failures, slowing a dictionary attack to a crawl
`crypto key generate rsa`	Global Config	Generates Rivest, Shamir, Adelman private/public key pairs (recommended modulus 2048)
`crypto key zeroize rsa`	Global Config	Deletes the key pair. SSH stops working until a new key is generated
`ip ssh version 2`	Global Config	Sets the global version of ssh to version 2
`ip ssh time-out <1-120>`	Global Config	Seconds the device waits for the SSH negotiation to finish before dropping it
`ip ssh authentication-retries <0-5>`	Global Config	Authentication attempts allowed before the SSH connection is closed
`transport input ssh`	Line VTY Config	Enables the ssh protocol and disables all other transport methods for connecting via VTY
`access-class ACL_NAME in`	Line VTY Config	Applies an access list so only listed source addresses may open a management session
`show ip ssh`	Priv EXEC	Displays whether SSH is enabled, its version, and the timeout and retry values in force
03 BASIC DEVICE SETUP AND MANAGEMENT		
`hostname HOSTNAME`	Global Config	Sets the hostname of the device
`ip domain-name DOMAIN`	Global Config	Sets the domain name of the platform (does not have to be a registered domain name)
`username USERNAME privilege <0-15> secret PASSWORD`	Global Config	Create username for AAA and ssh (login local) setting privilege level and secure password
`clock set hh:mm:ss <1-31> MONTH <1993-2035>`	Priv EXEC	Sets the system clock (time, day, month and year)
`interface <type> <number>`	Global Config	Changes configuration mode from Global Config to Interface Config (config-if)
`interface range <type> <first> - <last>`	Global Config	Applies one set of commands to a whole block of interfaces at once

Command	Mode	Description
`ip address <ip> <mask>`	Interface Config	Sets the IP address and mask of an interface (both written in dotted decimal format)
`ip address dhcp`	Interface Config	Takes the interface address from a DHCP server instead of configuring it statically
`no shutdown`	Interface Config	Enables the interface that has been administratively shut down
`description TEXT`	Interface Config	Free text label for the interface, returned by **`show interfaces description`**
`speed [10|100|1000|auto]`	Interface Config	Fixes the interface speed or leaves it to autonegotiation
`duplex [half|full|auto]`	Interface Config	Fixes the duplex setting or leaves it to autonegotiation. A mismatch shows as late collisions
`interface vlan <1-4094>`	Global Config	Creates the switched virtual interface used for switch management or inter-VLAN routing
`ip default-gateway <ip>`	Global Config	Sets the gateway used by a Layer 2 switch that is not itself routing
`show flash`	Priv EXEC	View the contents of the system flash directory (IOS image and vlan.dat stored here)
`dir nvram:`	Priv EXEC	View the contents of the non-volatile RAM (startup-config stored here)
`copy running-config startup-config`	Priv EXEC	Copies the current running-config in RAM to the startup-config in NVRAM
`copy flash tftp`	Priv EXEC	Copies files in flash to a backup location over the network
`copy <source> <destination>`	Priv EXEC	Copies source files to a destination (flash, tftp, startup-config, running-config)
`erase startup-config`	Priv EXEC	Deletes the saved configuration in NVRAM. The device next boots into setup mode
`delete vlan.dat`	Priv EXEC	Deletes the VLAN database in flash. Needed as well as erasing NVRAM for a full switch reset
`reload [in hh:mm | cancel]`	Priv EXEC	Restarts the device. The **`in`** form reboots to the saved config if a change locks you out
`telnet IP_ADDRESS`	User EXEC	Open a management session to a remote device using telnet
`ssh -l USERNAME IP_ADDR`	User EXEC	Open an encrypted management session to a remote device as the named user
`show sessions`	User EXEC	Display the active remote connections to the device
`show users`	User EXEC	Display the current information about the terminal lines
`show ip interface brief`	User EXEC	One line per interface - address, method, status and protocol. The quickest health check
`show interfaces <type> <number>`	User EXEC	Full interface detail - duplex, speed, counters, errors, drops, resets and last change
`show interfaces status`	User EXEC	Per port status, VLAN, duplex, speed and media type across the whole switch
`show mac address-table`	Priv EXEC	Learned and static MAC addresses with the VLAN and port each was heard on
04 DISCOVERY, TIME AND ADDRESSING SERVICES		
`cdp run`	Global Config	Enables Cisco Discovery Protocol for the device. On by default on most platforms
`no cdp enable`	Interface Config	Turns CDP off on one interface, normally one facing an untrusted network
`show cdp neighbors [detail]`	Priv EXEC	Directly connected Cisco devices. **`detail`** adds the IP address and IOS version
`lldp run`	Global Config	Enables Link Layer Discovery Protocol. Off by default, and vendor neutral
`show lldp neighbors [detail]`	Priv EXEC	Neighbours discovered by LLDP, including devices that are not Cisco
`ntp server <ip> [prefer]`	Global Config	Points the device at a time source. **`prefer`** marks the favoured server of several
`show ntp status`	Priv EXEC	Whether the clock is synchronised, at what stratum, and against which reference
`clock timezone NAME <-23-23>`	Global Config	Name and offset from UTC for the local time zone, so logs read in local time
`ip dhcp pool NAME`	Global Config	Creates an address pool and enters DHCP pool configuration mode
`network <ip> <mask>`	DHCP Pool Config	The subnet the pool leases addresses from
`default-router <ip>`	DHCP Pool Config	The gateway address handed to clients in the lease
`ip dhcp excluded-address <lo> <hi>`	Global Config	Holds a range back so the server never leases it - static addresses live there
`ip helper-address <ip>`	Interface Config	Forwards client broadcasts, DHCP among them, to a server on another subnet
`show ip dhcp binding`	Priv EXEC	Current leases - address, client identifier, lease expiry and type
05 PORT SECURITY		
`switchport mode access`	Interface Config	Required command to enable port security (can only be configured on static access ports)
`switchport port-security`	Interface Config	Enables the port security feature with defaults (violation shutdown and max mac one)
`switchport port-security violation [protect|restrict|shutdown]`	Interface Config	**protect** permits authorized hosts and drops unauthorized hosts with no notification **restrict** permits authorized hosts and drops unauthorized hosts with notification **shutdown** default mode forces port to err-disable blocking traffic and sends SNMP
`switchport port-security mac-address H.H.H`	Interface Config	Configures a secure static mac address on the port when port security is enabled
`switchport port-security mac-address sticky`	Interface Config	Enables learning of mac addresses - learned mac addresses are written to running-config

Command	Mode	Description
`switchport port-security maximum <1-132>`	Interface Config	Identify the maximum number of allowed mac addresses for the interface (range is platform dependent)
`switchport port-security aging time <0-1440>`	Interface Config	Minutes a learned secure address is kept before it ages out of the table
`switchport port-security aging type [absolute|inactivity]`	Interface Config	Age after a fixed period, or only once the host has stopped sending
`show port-security address`	Priv EXEC	Displays the secure mac address table (VLAN, mac, type, ports, age)
`show port-security interface <type> <number>`	Priv EXEC	Displays detailed port status, violation, aging, mac addresses, violation counters
`show port-security`	Priv EXEC	Every secured port on one screen with its maximum, current count and violation count
`errdisable recovery cause psecure-violation`	Global Config	Lets a port shut down by a violation bring itself back up instead of needing a visit
`errdisable recovery interval <30-86400>`	Global Config	Seconds an err-disabled port waits before recovery is attempted
`show interfaces status err-disabled`	Priv EXEC	Ports currently in err-disable and the reason each was shut down
06 VLAN (VIRTUAL LOCAL AREA NETWORK)		
`vlan <1-1005>`	Global Config	Create a VLAN globally - some switches may support an extended range (1006-4095)
`name WORD`	VLAN Config	Specifies the ascii name for the VLAN up to 32 alphanumeric characters (no spaces)
`switchport mode [access|dynamic auto|dynamic desirable|trunk]`	Interface Config	**access** configures the port as static access and disables Dynamic Trunking Protocol **dynamic auto** configures passive negotiation of a trunk (DTP not sent but accepted) **dynamic desirable** configures active negotiation of a trunk (DTP sent) **trunk** configures the port as static trunk but Dynamic Trunking Protocol messages sent
`switchport access vlan <1-1005>`	Interface Config	Assigns interface to a configured VLAN - ingress frames will be tagged in assigned VLAN
`switchport voice vlan <1-4094>`	Interface Config	Adds a tagged voice VLAN beside the untagged data VLAN so an IP phone and a PC share the port
`switchport trunk encapsulation [dot1q|isl]`	Interface Config	Sets the trunking mode when multiple modes supported and interface is in trunking mode
`switchport trunk native vlan <1-1005>`	Interface Config	Sets the VLAN ID of the native VLAN on the interface when it is in trunking mode
`switchport trunk allowed vlan [WORD|add|all|except|none|remove]`	Interface Config	**WORD** List the VLAN IDs of the allowed VLANs when the interface is in trunking mode **add|remove|except** add, remove or exclude VLANs from current list of allowed VLANs **all|none** allows all (default) or no VLANs when the interface is in trunking mode
`switchport trunk nonegotiate`	Interface Config	Used on trunk interfaces to disable the sending of Dynamic Trunking Protocol frames
`show vlan [<cr>|brief|id|name]`	User EXEC	Displays all, brief, per ID or name VLAN status including VLAN ID, name and membership
`show interfaces switchport`	User EXEC	Displays the interface switchport characteristics (mode, access, trunking, pvlan, pruning)
`show interfaces trunk`	User EXEC	Displays current interfaces in trunking mode, encapsulation, native vlan, allowed vlans
`interface <type> <number>.<subif>`	Global Config	Creates a subinterface - the router-on-a-stick approach to inter-VLAN routing
`encapsulation dot1q <1-4094> [native]`	Subif Config	Tags the subinterface with a VLAN ID. **`native`** leaves that one VLAN untagged
`ip routing`	Global Config	Enables IPv4 routing on a multilayer switch so its SVIs can route between VLANs
`no switchport`	Interface Config	Turns a switch port into a routed port that carries its own IP address
07 VTP (VLAN TRUNKING PROTOCOL)		
`vtp mode [server|client|transparent]`	Global Config	Sets the VLAN Trunking Protocol device mode (server is the default)
`vtp domain WORD`	Global Config	Sets the ascii name for the VTP administrative domain (case sensitive - no spaces)
`vtp password WORD`	Global Config	Sets the ascii password for the VTP administrative domain (case sensitive - no spaces)
`vtp version <1-2>`	Global Config	Sets the administrative domain VTP version number
`vtp pruning [on|off]`	Global Config	Sets the state of the dynamic VTP pruning of unused VLANs
`show vtp counters`	User EXEC	Displays the VTP statistics (summary, subset, request, revision and digest errors, pruning)
`show vtp status`	User EXEC	Displays the VTP domain status (version, revision, operating mode, domain name)
`show vtp password`	Priv EXEC	Displays the configured ascii password for the VTP administrative domain in clear text
08 STP (SPANNING TREE PROTOCOL)		
`spanning-tree mode [pvst|rapid-pvst]`	Global Config	Sets the spanning tree operating mode for Per-VLAN STP or Rapid Per-VLAN STP
`spanning-tree portfast default`	Global Config	Enables portfast by default on all access ports (disabled on ports operating as trunks)
`spanning-tree portfast bpduguard default`	Global Config	Enables BPDU guard on every portfast port at once - the pairing Cisco recommends
`spanning-tree vlan <1-1005> root [primary|secondary]`	Global Config	A macro to set the priority of a switch ensuring its status as root or backup root per VLAN
`spanning-tree vlan <1-1005> priority <0-61440>`	Global Config	Sets the bridge priority used in the bridge ID in increments of 4096

Command	Mode	Description
`spanning-tree bpduguard [enable|disable]`	Interface Config	Enables or disables the bpduguard feature (err-disable on BPDU receipt) on the interface
`spanning-tree guard root`	Interface Config	Enables the root guard feature (temporarily disables port on superior BPDU receipt)
`spanning-tree link-type [point-to-point|shared]`	Interface Config	Instructs STP to consider an interface as point-to-point (to switch) or shared (to hub)
`spanning-tree portfast [<cr>|disable|trunk]`	Interface Config	Enables or disables the portfast feature per interface or force portfast mode on a trunk
`spanning-tree vlan WORD port-priority <0-240>`	Interface Config	Sets the interface STP priority to influence root path selection in increments of 16
`spanning-tree vlan WORD cost <1-200000000>`	Interface Config	Overrides the cost STP derived from bandwidth, for this VLAN on this interface
`show spanning-tree [<cr>|vlan WORD|active]`	Priv EXEC	Displays STP status for all VLANs or listed VLANs (root info, local info, int status and roles)
`show spanning-tree summary`	Priv EXEC	Displays STP mode, root status, extended system ID, portfast status, active STP features
`show spanning-tree detail`	Priv EXEC	Displays STP status detail for all VLANs (topology changes, timers, detailed port status)
`show spanning-tree interface <type> <number>`	Priv EXEC	Displays STP interface status and configuration (VLAN, role, status, cost, priority, type)
`show spanning-tree inconsistentports`	Priv EXEC	Displays STP ports in an inconsistent state (disabled by root guard feature)
`show spanning-tree root`	Priv EXEC	Root bridge ID, root cost, root port and the timers, one line per VLAN
`show spanning-tree blockedports`	Priv EXEC	The ports STP is currently holding in a blocking state, and for which VLANs
09 ETHERCHANNEL		
`channel-group <1-48> mode [on|active|passive|desirable|auto]`	Interface Config	**active|passive** negotiates with LACP (802.3ad) - active initiates, passive answers **desirable|auto** negotiates with PAgP - desirable initiates, auto answers **on** forms the bundle statically with no negotiation at all - both ends must match
`interface port-channel <1-48>`	Global Config	Configures the logical bundle. Settings here apply to every member port
`port-channel load-balance METHOD`	Global Config	The hash used to spread frames across members (src-mac, dst-ip, src-dst-ip and others)
`lacp port-priority <1-65535>`	Interface Config	Decides which ports are active when more than eight are configured in an LACP bundle
`show etherchannel summary`	Priv EXEC	One line per bundle - protocol, flags and the state of every member port
`show interfaces etherchannel`	Priv EXEC	Per member protocol state and the partner device seen on the far end
10 STATIC AND DEFAULT ROUTING		
`ip route <net> <mask> <next-hop>`	Global Config	Static route pointed at the address of the next router along the path
`ip route <net> <mask> <exit-int>`	Global Config	Static route out an interface. Safe only on point-to-point links
`ip route <net> <mask> <exit-int> <next-hop>`	Global Config	Fully specified static route - the form to use on any multi-access link
`ip route <net> <mask> <next-hop> <1-255>`	Global Config	Adds an administrative distance, making it a floating static route used only if the first fails
`ip route 0.0.0.0 0.0.0.0 <next-hop>`	Global Config	Default route, the gateway of last resort for any traffic with no more specific match
`ip route <net> <mask> null 0`	Global Config	Silently discards matching traffic. Used with summarisation to stop routing loops
`show ip route`	User EXEC	The routing table - source code, prefix, distance and metric, next hop, age and interface
`show ip route <ip>`	User EXEC	The single entry that would actually be used to forward toward that address
`show ip protocols`	User EXEC	Which routing protocols are running, their timers, networks, neighbours and distances
`ping <ip>`	User EXEC	Five ICMP echoes to test reachability and round trip time
`ping`	Priv EXEC	Extended ping - prompts for source interface, datagram size, count, timeout and DF bit
`traceroute <ip>`	User EXEC	Every hop toward the destination with three round trip times each
`undebug all`	Priv EXEC	Turns off every running debug. Worth memorising as `u all` before you ever start one
11 ACLS (ACCESS CONTROL LISTS)		
`access-list <1-99> [permit|deny] <src> <wildcard>`	Global Config	Numbered standard ACL. Matches on source address only, so apply it close to the destination
`access-list <100-199> [permit|deny] <proto> <src> <wc> <dst> <wc> [eq PORT]`	Global Config	Numbered extended ACL. Matches protocol, source, destination and port, so apply it close to the source
`ip access-list standard NAME`	Global Config	Named standard ACL. Entries are numbered, so a single line can be added or removed later
`ip access-list extended NAME`	Global Config	Named extended ACL, entered and edited the same way
`<seq> [permit|deny] ...`	ACL Config	A sequence number places the entry between existing lines instead of appending it
`remark TEXT`	ACL Config	A comment inside the list recording what the entries below it are for
`permit ip any any`	ACL Config	Explicit permit. Every ACL ends in an invisible `deny ip any any`
`ip access-group NAME [in|out]`	Interface Config	Applies the list to traffic entering or leaving the interface

Command	Mode	Description
`show access-lists`	Priv EXEC	Every list on the device with its entries and the hit count against each line
`show ip interface <type> <number>`	Priv EXEC	Confirms which access list is applied inbound and outbound on the interface
`clear access-list counters`	Priv EXEC	Resets the hit counters so the next test can be measured cleanly
12 OSPF (OPEN SHORTEST PATH FIRST)		
`router ospf <1-65535>`	Global Config	Starts an OSPFv2 process. The process ID is locally significant and need not match a neighbour
`router-id A.B.C.D`	Router Config	Fixes the 32-bit router ID instead of letting IOS pick a loopback or interface address
`network <ip> <wildcard> area <id>`	Router Config	Enables OSPF on every matching interface and places it in the named area
`passive-interface <type> <number>`	Router Config	Keeps advertising the network but stops hellos leaving the interface
`passive-interface default`	Router Config	Makes every interface passive. Re-enable each real neighbour with **`no passive-interface`**
`default-information originate`	Router Config	Advertises this router's own default route into the OSPF domain
`auto-cost reference-bandwidth <1-4294967>`	Router Config	Raises the reference bandwidth in Mb so links faster than 100 Mb still get distinct costs
`area <id> stub [no-summary]`	Router Config	Makes the area a stub, or totally stubby with **`no-summary`**
`ip ospf <pid> area <id>`	Interface Config	Enables OSPF on the interface directly - the modern alternative to a network statement
`ip ospf cost <1-65535>`	Interface Config	Sets the cost outright, overriding the value derived from bandwidth
`ip ospf priority <0-255>`	Interface Config	Influences the DR and BDR election on a multi-access link. **`0`** never becomes DR
`ip ospf [hello-interval|dead-interval] <1-65535>`	Interface Config	Hello and dead timers in seconds. A mismatch stops the adjacency forming at all
`ip ospf network point-to-point`	Interface Config	Suppresses the DR/BDR election where only two routers share the link
`show ip ospf neighbor`	Priv EXEC	Neighbours, adjacency state, DR/BDR role, dead timer and the interface each was heard on
`show ip ospf interface [brief]`	Priv EXEC	Per interface cost, area, network type, timers, and how many neighbours are up
`show ip ospf database`	Priv EXEC	The link state database - LSA type, advertising router, age and sequence number
`clear ip ospf process`	Priv EXEC	Restarts the process and forces a fresh DR/BDR election. Disruptive - lab use
13 NAT (NETWORK ADDRESS TRANSLATION)		
`ip nat inside`	Interface Config	Marks the interface that faces the private network
`ip nat outside`	Interface Config	Marks the interface that faces the public network
`ip nat inside source static <local> <global>`	Global Config	One-to-one static translation for a host that must always keep the same public address
`ip nat inside source static tcp <local> <port> <global> <port>`	Global Config	Static PAT - publishes one internal service on a public address and port
`ip nat pool NAME <start> <end> netmask <mask>`	Global Config	The range of public addresses dynamic NAT draws from
`ip nat inside source list ACL pool NAME`	Global Config	Dynamic NAT - hosts permitted by the ACL take the next free address from the pool
`ip nat inside source list ACL interface <int> overload`	Global Config	PAT - many inside hosts share the interface address, told apart by port number
`show ip nat translations`	Priv EXEC	The translation table - inside local, inside global, outside local and outside global
`show ip nat statistics`	Priv EXEC	Hits, misses, active translations, and which interfaces are inside and outside
`clear ip nat translation *`	Priv EXEC	Clears the dynamic entries so the next packet is translated afresh
14 IPV6		
`ipv6 unicast-routing`	Global Config	Enables IPv6 routing and router advertisements. Nothing IPv6 routes until this is set
`ipv6 address <addr>/<len>`	Interface Config	Static global unicast address with its prefix length
`ipv6 address <prefix>/<len> eui-64`	Interface Config	Builds the host half of the address from the MAC using modified EUI-64
`ipv6 address autoconfig`	Interface Config	Derives the address from the router advertisement using SLAAC
`ipv6 enable`	Interface Config	Enables IPv6 and generates a link-local address without configuring a global one
`ipv6 route <prefix>/<len> <next-hop>`	Global Config	IPv6 static route. **`::/0`** in place of the prefix makes it the default route
`ipv6 router ospf <1-65535>`	Global Config	Starts an OSPFv3 process for IPv6
`ipv6 ospf <pid> area <id>`	Interface Config	Enables OSPFv3 on the interface. OSPFv3 has no network statement at all
`show ipv6 interface brief`	User EXEC	One line per interface with its link-local and global addresses
`show ipv6 neighbors`	Priv EXEC	The neighbour cache - IPv6's replacement for the ARP table

Command	Mode	Description
15 HSRP (FIRST HOP REDUNDANCY)		
`standby <0-255> ip <virtual-ip>`	Interface Config	Creates the HSRP group and the virtual address the hosts use as their gateway
`standby <0-255> priority <0-255>`	Interface Config	Highest priority becomes active. 100 is the default, so any higher value wins
`standby <0-255> preempt`	Interface Config	Lets a recovered higher priority router take the active role back
`standby <0-255> track <int> <decrement>`	Interface Config	Drops priority when the tracked uplink fails, handing the active role to the other router
`standby version 2`	Interface Config	HSRP version 2 - wider group range, millisecond timers and IPv6 support
`show standby [brief]`	Priv EXEC	Group state, virtual address, which router is active and which is standby
16 EIGRP (ENHANCED INTERIOR GATEWAY ROUTING PROTOCOL)		
`router eigrp <1-65535>`	Global Config	Starts a classic EIGRP process. The number is the autonomous system and MUST match every neighbour
`network <classful-net>`	Router Config	Enables EIGRP on every interface inside that classful network
`network <net> <wildcard>`	Router Config	Enables EIGRP only on interfaces matching the wildcard - the form to prefer
`no auto-summary`	Router Config	Stops EIGRP summarising to the classful boundary. Off by default from IOS 15
`eigrp router-id A.B.C.D`	Router Config	Fixes the 32-bit router ID rather than letting IOS derive it
`passive-interface <type> <number>`	Router Config	Advertises the network but stops hellos, so no neighbour forms on that interface
`variance <1-128>`	Router Config	Multiplier that lets EIGRP load balance across unequal cost feasible successors
`maximum-paths <1-32>`	Router Config	How many equal cost routes EIGRP installs in the routing table. Default is four
`ip bandwidth-percent eigrp <as> <1-999>`	Interface Config	Share of interface bandwidth EIGRP may use. Default is 50 per cent
`ip summary-address eigrp <as> <net> <mask>`	Interface Config	Advertises one summary out of the interface in place of the component routes
`ip hello-interval eigrp <as> <sec>`	Interface Config	Hello timer. Unlike OSPF, EIGRP timers do not have to match to form an adjacency
`ip hold-time eigrp <as> <sec>`	Interface Config	How long a neighbour is held before it is declared down. Normally three times the hello
`show ip eigrp neighbors`	Priv EXEC	Neighbours, the interface each was heard on, hold time, uptime, SRTT and queue count
`show ip eigrp topology`	Priv EXEC	The topology table - successors, feasible successors, feasible distance and reported distance
`show ip eigrp interfaces`	Priv EXEC	Which interfaces are running EIGRP, peer count and pending routes
`show ip eigrp traffic`	Priv EXEC	Counts of hellos, updates, queries, replies and acknowledgements sent and received
17 LAYER 2 SECURITY, AAA AND 802.1X		
`ip dhcp snooping`	Global Config	Enables DHCP snooping globally. Nothing is inspected until VLANs are added below
`ip dhcp snooping vlan <list>`	Global Config	Applies snooping to the listed VLANs, blocking replies from a rogue DHCP server
`ip dhcp snooping trust`	Interface Config	Marks the uplink toward the real DHCP server. Every other port stays untrusted
`ip dhcp snooping limit rate <pps>`	Interface Config	Caps DHCP messages per second on an untrusted port to blunt a starvation attack
`ip arp inspection vlan <list>`	Global Config	Dynamic ARP Inspection - validates ARP against the DHCP snooping binding table
`ip arp inspection trust`	Interface Config	Exempts an inter-switch link from ARP inspection
`aaa new-model`	Global Config	Enables the AAA subsystem. Prerequisite for RADIUS, TACACS+ and 802.1X
`radius server NAME`	Global Config	Names a RADIUS server and enters its configuration to set address and key
`aaa authentication login default group radius local`	Global Config	Authenticates logins against RADIUS and falls back to the local database if it is unreachable
`dot1x system-auth-control`	Global Config	Enables 802.1X port based authentication for the switch
`authentication port-control auto`	Interface Config	The port forwards no user traffic until the supplicant authenticates
`show ip dhcp snooping binding`	Priv EXEC	The binding table - MAC, leased address, lease time, VLAN and interface
`show ip arp inspection`	Priv EXEC	ARP inspection state per VLAN with forwarded, dropped and error counts
`show dot1x [interface <type> <number>]`	Priv EXEC	802.1X state per port, and whether the supplicant has authorised
18 LOGGING, SNMP AND MONITORING		
`logging host <ip>`	Global Config	Sends syslog messages to an external collector. Local buffers survive nothing
`logging trap <0-7>`	Global Config	Severity sent to the syslog server, 0 emergency through 7 debugging
`logging buffered <size>`	Global Config	Keeps messages in a RAM buffer that **`show logging`** reads back
`logging console <0-7>`	Global Config	Severity displayed on the console. Lower it before a busy debug

Command	Mode	Description
`service timestamps log datetime msec`	Global Config	Stamps every message with the date and time to the millisecond
`show logging`	Priv EXEC	The logging configuration and the contents of the buffer
`snmp-server community STRING [ro|rw]`	Global Config	SNMPv2c community string and whether it grants read only or read write access
`snmp-server location TEXT`	Global Config	Where the device physically is, returned to the management station
`snmp-server host <ip> version 2c STRING`	Global Config	Where to send traps, and the community string to send them with
`snmp-server group NAME v3 priv`	Global Config	SNMPv3 group requiring both authentication and encryption - the only secure version
`ip flow-export destination <ip> <port>`	Global Config	Sends NetFlow records to a collector for traffic analysis
`ip flow ingress`	Interface Config	Collects NetFlow on traffic entering the interface
`show ip cache flow`	Priv EXEC	The NetFlow cache - protocol, source and destination, ports and packet counts
`monitor session <1-66> source interface <int>`	Global Config	SPAN source - the port whose traffic is copied for a packet analyser
`monitor session <1-66> destination interface <int>`	Global Config	SPAN destination - the port the analyser is plugged into
`show monitor session all`	Priv EXEC	Configured SPAN sessions with their sources, destinations and direction
19 QUALITY OF SERVICE		
`mls qos`	Global Config	Enables QoS on a Catalyst switch. Until it is set, every marking is ignored
`mls qos trust [cos|dscp]`	Interface Config	Accepts the marking arriving from the neighbour instead of rewriting it to zero
`auto qos voip trust`	Interface Config	Applies Cisco's recommended voice QoS settings to the port in one command
`class-map match-all NAME`	Global Config	Identifies the traffic a policy will act on, by ACL, protocol or existing marking
`policy-map NAME`	Global Config	Says what happens to the traffic each class map matched - mark, police or queue
`service-policy [input|output] NAME`	Interface Config	Applies the policy map to the interface in one direction
`show mls qos interface <type> <number>`	Priv EXEC	Trust state, queueing and policing configured on the interface
`show policy-map interface <type> <number>`	Priv EXEC	Per class packet and byte counts, so you can see the policy actually matching
20 WIRELESS LAN CONTROLLER (AIREOS CLI) the CCNA wireless configuration is done through the controller GUI — these are the equivalents at its command line		
`show sysinfo`	WLC EXEC	Controller model, software version, uptime, and the AP and client counts
`show ap summary`	WLC EXEC	Access points joined to the controller with model, MAC, address and AP group
`show wlan summary`	WLC EXEC	Configured WLANs with their ID, SSID, admin status and mapped interface
`show client summary`	WLC EXEC	Associated clients, the AP each is on, its WLAN, protocol and data rate
`show interface summary`	WLC EXEC	Controller interfaces, their VLAN, address and the port each is bound to
`config wlan disable <id>`	WLC EXEC	A WLAN must be disabled before most of its settings can be changed
`config wlan security wpa akm 802.1x enable <id>`	WLC EXEC	Sets WPA2 Enterprise (802.1X) authentication on the WLAN
`config wlan security wpa akm psk enable <id>`	WLC EXEC	Sets WPA2 Personal - a pre-shared key rather than a RADIUS server
`config interface vlan NAME <vlan>`	WLC EXEC	Maps a dynamic interface to the VLAN that carries that WLAN's traffic
`config wlan enable <id>`	WLC EXEC	Brings the WLAN back into service once its settings are complete
21 LEGACY WAN AND DISTANCE VECTOR ROUTING not on the current CCNA 200-301 blueprint — retained for reference and for older equipment		
`router rip`	Global Config	Starts the RIP routing process
`version 2`	Router Config	RIPv2 - classless, carries the subnet mask in updates and supports VLSM
`network <classful-net>`	Router Config	Advertises the classful network and enables RIP on every interface inside it
`no auto-summary`	Router Config	Stops RIP summarising back to the classful boundary at every major network edge
`encapsulation hdlc`	Interface Config	Cisco HDLC, the default serial encapsulation between two Cisco routers
`encapsulation ppp`	Interface Config	Point-to-Point Protocol, used where the far end is not a Cisco device
`ppp authentication chap`	Interface Config	Requires CHAP authentication before the PPP link comes up
`clock rate <bps>`	Interface Config	Set on the DCE end of a back-to-back serial cable in a lab. **`show controllers`** finds it
`encapsulation frame-relay [ietf]`	Interface Config	Frame Relay encapsulation - Cisco by default, **`ietf`** toward another vendor
`show frame-relay pvc`	Priv EXEC	PVC status and DLCI with the FECN, BECN and DE counters
`show interfaces serial <number>`	Priv EXEC	Serial line status, encapsulation, keepalives, and the input and output error counters