Huawei Commands :

Basic Configuration:

Huawei privileges note `<switch1>super`	Privilege note: 0-VISIT, 1- MONITOR, 2-SYSTEM, 3-MANAGE Super command for manage mode.
Changing switch hostname	

`<Huawei>system-view`
`[Huawei]sysname switch1`
`[switch1]quit`	

Log in with console	

`<Huawei>system-view`
`[Huawei]user-interface console 0`
`[Huawei-ui-console0]user privilege level 3`
`[Huawei-ui-console0] quit`	

Configuring passwords	

`[switch1]user-interface vty 0 4`
`[switch1-ui-vty0-4]user privilege level 3`
`[switch1-ui-vty0-4]authentication-mode password`
`[switch1-ui-vty0-4]set authentication password`
`cipher password`
`[switch1-ui-vty0-4]display this`
	To set number of users concurrently work with.
	Default privilege level is 0. Set 3 for manage.
	Authentication mode aaa is recommended.
	  aaa AAA authentication
	  none Login without checking
	  password Authentication through the
	To check configuration.

Configuring passwords with username	

`[Huawei]user-interface vty 0 4`
`[Huawei-ui-vty0-4]authentication-mode aaa`
`[Huawei-ui-vty0-4]quit`
`[Huawei]aaa`
`[Huawei-aaa]local-user user1 password cipher`
`password1`
`Info: Add a new user.`
`[Huawei-aaa]local-user user1 service-type telnet`
`[Huawei-aaa]local-user user1 privilege level 3`
`[Huawei-aaa]display this`
`[Huawei-aaa]quit`	

Giving the switch an IP address	

`<Huawei>system-view`
`[Huawei]interface Vlanif 1`
`[Huawei-Vlanif1]ip address 10.1.1.1 30`
`[Huawei-Vlanif1]display this`
`[Huawei-Vlanif1]quit`
`<Huawei>display ip interface brief`	

Setting the default route	
`[Huawei]ip route-static 0.0.0.0 0 10.1.1.1` `[Huawei]display ip routing-table`	
Saving configuration	

`<Huawei>save`
`The current configuration will be written to the device.`
`Are you sure to continue?[Y/N]Y`
`Info: Please input the file name ( *.cfg, *.zip )`
`[vrpcfg.zip]:`
`Aug 10 2018 22:53:09-08:00 Huawei`
`%%01CFM/4/SAVE(l)[0]:The user chose Y when dec`
`iding whether to save the configuration to the device.`
`Now saving the current configuration to the slot 0.`
`Save the configuration successfully`	

Configuring switch to use SSH	
``` [Huawei]rsa local-key-pair create [Huawei]user-interface vty 0 4 [Huawei-ui-vty0-4]authentication-mode aaa [Huawei-ui-vty0-4]protocol inbound ssh [Huawei-ui-vty0-4]quit ```	To generate rsa key
``` [Huawei]aaa [Huawei-aaa]local-user user1 password cipher user1 [Huawei-aaa]local-user user1 privilege level 3 [Huawei-aaa]local-user user1 service-type ssh [Huawei-aaa]quit [Huawei]ssh authentication-type default password ```	User1 is username
``` Huawei]stelnet server enable From client/remote switch ssh client first-time enable [Huawei]stelnet 10.1.1.1 Please input the username:user1 The server is not authenticated. Continue to access it? [Y/N] :Y Save the server's public key? [Y/N] : %01SSH/4/SAVE_PUBLICKEY(l)[3]:When deciding whether to save the server's public key 10.1.1.1, the user chose Y. Enter password: ```	This section from other switch. Client switch configuration
Description, speed and duplex	
``` [huawei]interface GigabitEthernet 0/0/1 [huawei-GigabitEthernet0/0/1]speed 100 [huawei-GigabitEthernet0/0/1]duplex full [huawei-GigabitEthernet0/0/1]description Uplink ```	

Verify Basic Configuration	
`[huawei]display version`	To display version of VRP.
`[huawei]display version`	Shows the current configuration file stored in flash default file is vrpcfg.cfg
`<switch1>display startup`	To check the statrtup files used for the next startup.
`<switch1>display history-command`	Lists the commands currently held in the history buffer.
`<switch1>display ip interface brief`	Shows an overview of all interfaces, their physical status, protocol status and ip address if assigned.
`[switch1]display user-interface`	To check the user interface that a device supports
`[switch1]display interface Ethernet brief`	To display ether interface
`[switch1]display interface description`	To display interface description
`[switch1]display arp all`	To show all arp entry

Port Security		
``` [sw1]interface GigabitEthernet 0/0/2 [sw1-GigabitEthernet0/0/2]port-security enable [sw1-GigabitEthernet0/0/2]port-security mac-address sticky [sw1-GigabitEthernet0/0/2]port-security max-mac-num 5 [sw1-GigabitEthernet0/0/2]quit ```	The sticky MAC function usually applies to networks where terminal users seldom change
`` port-security protect-action { protect	restrict | shutdown } ```	It's optional. By default mode is restrict.

VLAN Configuration	
```<switch1>system-view [switch1]vlan 10 [switch1-vlan10]name technical [switch1-vlan10]quit```	Create a new VLAN and give it a name Name is not supported by all switches.
```[switch1]vlan vlan-name ece_dept [switch1-vlan10]quit```	After a name is configured for a VLAN, we can directly enter the VLAN view using the name.

There are three types VLAN in huawei
   • Access
   • Trunk
   • Hybrid
 	
Default VLAN on Huawei devices is Hybrid.
	• Hybrid interface allows tagged frames from multiple VLANs Frames send out from a hybrid interface are tagged or untagged according to the VLAN configuration.
	• Hybrid interface has the ability to selectively perform and removal of VLAN tags from frames that differ from PVID of the port interface.

Assign an access interface to access a specific VLAN: ```[switch1]interface GigabitEthernet 0/0/2 [switch1-GigabitEthernet0/0/2]port link-type access [switch1-GigabitEthernet0/0/2]port default vlan 10 [switch1-GigabitEthernet0/0/2]quit```	
Configuring the trunk interface: ```[switch1]interface GigabitEthernet 0/0/4 [switch1-GigabitEthernet0/0/4]port link-type trunk [switch1-GigabitEthernet0/0/4]port trunk allow-pass vlan 10 to 20 [switch1-GigabitEthernet0/0/4]port trunk allow-pass vlan all [switch1-GigabitEthernet0/0/4]port trunk pvid vlan 10 [switch1-GigabitEthernet0/0/4]quit```	• To set the link type as trunk. • Allow specific VLANS to this interface • Allow all vlans • Set default VLAN for trunk interface.
Configuring the hybrid interface: ```[switch1]interface GigabitEthernet 0/0/5 [switch1-GigabitEthernet0/0/5]port link-type hybrid [switch1-GigabitEthernet0/0/5]port hybrid untagged vlan 10 to 20 [switch1-GigabitEthernet0/0/5]port hybrid tagged vlan 5 to 7 [switch1-GigabitEthernet0/0/5]port hybrid pvid vlan 10 [switch1-GigabitEthernet0/0/5]quit```	• To set port type hybrid • The hybrid interface is added to the VLAN in untagged mode • The hybrid interface is added to the VLAN in tagged mode • The default VLAN is configured for the hybrid interface.
Create multiple VLAN: ```[switch1]vlan batch 11 to 20 [switch1]vlan batch 10 15 to 19 25 28 to 30```	

Link Type Negotiation protocol(LNP) Like Cisco DTP (Optional)	

Link-type Negotiation Protocol (LNP) dynamically negotiates the link type of an Ethernet Interface.The negotiated link type can be access or trunk.
- The Ethernet interface that is negotiated as an access interface joins VLAN 1 by default.
- The Ethernet interface that us negotiated as a trunk interface joins VLAN1 to VLAN 4094 by default.

After LNP is enabled, LNP negotiation is triggered in the following situations.
- The local device receives LNP packets from the remote device.
- The local configuration or interface status changes.

In addition to access, hybrid, trunk, Dot1q tunnel. LNP provides following link types:

Negotiation-desireable: The local device actively sends LNP packets.

Negotiation-auto : The local device does not actively send LNP packets.

Configuration:

`port link-type negotiation-auto`	Configure the link dynamic negotiation mode as auto.
`port link-type negotiation-desirable`	Configure the link dynamic negotiation mode as desirable
`port trunk allow-pass only-vlan 1 to 9 11 to 4094`	Remove an interface from a VLAN in negotiation mode. For example, remove an interface from VLAN 10.
`port negotiation disable`	Disable auto-negotiation of an interface.
`lnp disable`	Disable global LNP
`portswitch`	If the interface is not layer2
`display lnp summary`	To view auto negotiation to all interface
`display lnp interface gig0/0/5`	To view information to a specific interface

Verify VLAN Configuration	
`[switch1]display vlan summary`	Summary information of vlans
`[switch1]display vlan`	Display all vlan
`[switch1]display vlan 10`	Show all information of vlan 10
`[switch1]display port vlan`	To view types of port and VLAN configuration

GVRP/ Dynamic VLAN configuration.	

The **Generic Attribute Registration Protocol (GARP)** defined by IEEE effectively reduces the manual workload in VLAN configuration. GARP includes two protocols:

GARP Multicast Registration Protocol (GMRP) and

GARP VLAN Registration Protocol (GVRP).

Manually created VLANs are called static VLANs, and VLANs created by the GVRP are called dynamic VLANs. GVRP allows VLAN attribute transmission between switches to implement dynamic VLAN registration and deregistration on switches.

After configuring GVRP, you only need to manually configure VLANs on a few switches, and then these switches deliver VLAN configurations to other switches.

`[sw1]gvrp`	Enable GVRP on a port. (Note: GVRP must be globally enabled on a switch before it is enabled on a port of the switch.
`[sw1-GigabitEthernet0/0/1]gvrp`	GVRP can be configured only on Trunk ports.
[sw1]display vlan summary	After GVRP configuration, It shows Total 8 dynamic vlan.

Link technology (Link aggregation)

Ethernet Link aggregation, also called Eth-Trunk, bundles multiples physical links to form a logical link to increase link bandwidth.

- Bundle links back up each other, increase reliability.

Link aggregation has two modes a) Manual mode. b) LACP (Link aggregation control protocol) mode

Manual Mode: All links are active links. All active links participate in data forwarding.

LACP Mode: Some links are active links. All active links participate in data forwarding. If an active links fails, the system selects a link among the inactive links as the active link.

Link aggregation manual mode configuration [sw1]interface Eth-Trunk 1 [sw1-Eth-Trunk1]mode manual load-balance [sw1-Eth-Trunk1]trunkport GigabitEthernet 0/0/1 to 0/0/3 [sw1-Eth-Trunk1]port link-type trunk [sw1-Eth-Trunk1]port trunk allow-pass vlan 10 [sw1-Eth-Trunk1]quit	To create a Ethernet-Trunk interface. The value of trunk-id ranges from 0 to 127 .Mode configuration. . Add physical ports GE1/0/1, GE1/0/2, and GE1/0/3 to logical port Eth-Trunk1 . Logical port works like a physical trunk port Enable eth-trunk to allow frame from specific VLAN
Link aggregation LACP mode configuration [sw1]interface Eth-Trunk 2 [sw1-Eth-Trunk2]mode lacp-static [sw1-Eth-Trunk2]trunkport GigabitEthernet 0/0/4 to 0/0/10 [sw1-Eth-Trunk2]max active-linknumber 4 [sw1-Eth-Trunk2]least active-linknumber 2 [sw1-Eth-Trunk2]port link-type trunk [sw1-Eth-Trunk2]port trunk allow-pass vlan all [sw1-Eth-Trunk2]quit	LACP mode configure Set maximum active link (By default, it is 8) Set minimum active link (By default, it is1) Port configuration in trunk mode
LACP Priority configure: [sw1]lacp priority 100 [sw1-GigabitEthernet0/0/6]lacp priority 100	In system-view, The LACP system priority is set. A smaller LACP priority value indicates a higher priority. By Default LACP priority id 32768.It ranges from 0 to 65535 Set priority to interface.

Smart Link

[sw1]interface GigabitEthernet 0/0/1 [sw1-GigabitEthernet0/0/2]stp disable [sw1-GigabitEthernet0/0/2]quit	To enable smart link we have to disable STP to all port connected via smart link group
[sw1]smart-link group 1 [sw1-smlk-group1]port GigabitEthernet 0/0/1 master [sw1-smlk-group1]port GigabitEthernet 0/0/2 slave [sw1-smlk-group1]flush send control-vlan 10 password simple abc123 [sw1-smlk-group1]restore enable [sw1-smlk-group1]timer wtr 50 [sw1-smlk-group1]smart-link enable [sw1-smlk-group1]quit	Create a smart-link group. Set primary link Set secondary link To enable smart link group 1 to send send flush frames. Restore command is used for switchback function. Timer for switchback function. Finally enable the smart link
Others switches: [sw2-GigabitEthernet0/0/1]smart-link flush receive control-vlan 10 password simple abc123 [sw3-GigabitEthernet0/0/2]quit	smart-link flush receive command to enable their ports capable of receiving and processing flush frames that carry control VLAN ID 10.
[sw1]display smart-link group 1	To view the information of smart link group 1

Monitor link	
A Monitor link group consists of one uplink port and one or more downlink ports. If the uplink port goes down, all download port are immediately set to down state. • This protocols sometimes used with smart link minimize of frame loss	

`[sw1]monitor-link group 1`
`[sw1-mtlk-group1]smart-link group 1 uplink`
`[sw1-mtlk-group1]port GigabitEthernet 0/0/3`
`downlink 1`
`[sw1-mtlk-group1]timer recover-time 10`
`[sw1-mtlk-group1]quit`
	To create a monitor link.
	Set uplink port
	Set download port
	
	Set recovery time in seconds

`[sw1]display monitor-link group 1`	To view monitor link group info.

STP	
`[sw1]stp mode stp` `[sw1]stp mode rstp`	Set the STP mode. The mode is set to MSTP by default.
`[sw1]stp root primary`	Set the root bridge Once the command is run on the device, the device's bridge priority value is automatically set to 0
`[sw2]stp root secondary`	Set the secondary root bridge.
Optional: Setting a Priority for a Switching Device `[sw1]stp priority 100`	A priority is set for the switching device. The default priority value of a switching device is 32768. If the stp root primary or stp root secondary command has been executed to configure the device as the root bridge or secondary root bridge, run the undo stp root command to disable the root bridge or secondary root bridge function and then run the stp priority priority command to set a priority.

Optional: Setting a Path Cost for a Port
 	
`[sw3]stp pathcost-standard dot1t`
 	
`[sw3-GigabitEthernet0/0/1]stp cost 100`
	A path cost calculation method is specified.
	By default, the IEEE 802.1t standard (dot1t) is used to calculate the path costs.
	All switching devices on a network must use the same path cost calculation method.
	A path cost is set for the interface.
	When the Huawei calculation method is used, cost ranges from 1 to 200000.
	When the IEEE 802.1d standard method is used, cost ranges from 1 to 65535.
	When the IEEE 802.1t standard method is used, cost ranges from 1 to 200000000.

Setting a priority for a port
`[sw1-GigabitEthernet0/0/1]stp port`
`priority 16`
`[sw1-GigabitEthernet0/0/1]quit`
	In spanning tree calculation, **priorities of the ports in a ring affect designated port election**.
	To block a port on a switching device, set a greater priority value than the default priority value for the port.
	In spanning tree calculation, priorities of the ports in a ring affect designated port election.
	To block a port on a switching device, set a greater priority value than the default priority value for the port.

`[sw1]display stp brief`
`[sw1]display stp interface`
`GigabitEthernet 0/0/1`
	To checking STP configuration.

`[sw1]stp enable`	Configurations on a switching device, such as the device priority and port priority, affect spanning tree calculation. Any change to the configurations may cause network flapping. To ensure rapid, stable spanning tree calculation, perform basic configuration on the switching device and its ports before enabling STP/RSTP.

MSTP
MSTP implements load balancing among VLANs. Traffic in different VLANs is transmitted along different paths. MSTP Implements fast convergence and provides multiple paths to load balance VLAN Traffic. MSTP divides a switching network into multiple regions, each of which has multiple spanning trees that are independent of each other. • An MST (Multiple spanning tree) region consists of several switching devices on the switching network and the network segments between the switches. • Each spanning tree is called an MSTI(MST Instance). The VLANs in a region are allocated into different groups. Each group has certain topology. Then MST instances are configured. MSTP maps one or multiple VLANs to each MSTI.

MSTP Configuration	
`[sw1]stp  mode mstp`	The working mode of the switching device is configured as MSTP. By default, the working mode is MSTP.

MSTP region configuration. Configure to all switches.
`[sw1]stp region-configuration`
`[sw1-mst-region]region-name RG1`
`[sw1-mst-region]instance 1 vlan 2 to 10`
`[sw1-mst-region]instance 2 vlan 11 to 20`
`[sw1-mst-region]active region-configuration`
`[sw1-mst-region]quit`
	MST region view is displayed.
	Create MST region
	Configure VLAN-to-instance mappings.
	
	MST configurations are activated.

Configuring root bridge and secondary root bridge.
`[sw1]stp instance 1 root primary`
`[sw1]stp instance 2 root secondary`
 	
`[sw2]stp instance 2 root primary`
`[sw2]stp instance 1 root secondary`
	
	Set switch1 as primary root for instance 1
	Set switch1 as secondary root for instance 2
	
	Set switch2 as primary root for instance 2
	Set switch2 as secondary root for instance 1

(Optional) Setting a Path Cost of a Port in an MSTI
 	
`[sw3]stp pathcost-standard legacy`
`[sw3-GigabitEthernet0/0/3]stp instance 2 cost 2000`
`[sw3-GigabitEthernet0/0/3]quit`
	The MSTP **path cost determines root port selection** in an MSTI. The port with the lowest path cost to the root bridge is selected as a root port.
	  dot1d-1998 IEEE 802.1D-1998
	  dot1t IEEE 802.1T
	  legacy Legacy [Huawei standard]
	
	** Same as STP section describe above.
	**Path cost is used for root port. Priority is used for designated port.

Verify the configuration
`[sw1]display stp brief`
`[sw1]display stp region-configuration  [sw1]display`
`[sw1]stp interface GigabitEthernet 0/0/2 brief`
`[sw1]display stp interface GigabitEthernet 0/0/2`
	To view brief information
	To view region configuration
	To view brief information
	Display details information.

VRRP	
VRRP is a redundancy protocol. VRRP groups several physical routers into a virtual router. If next hop switch of a host fails, VRRP switches traffic to another switch, ensuring continuous and reliable communication. The VRRP virtual router is identified by the virtual router ID (VRID) and the virtual IP address. Multiple virtual routers can be configured on an interface. VRRP determines the device role in the virtual router based on device priorities. The device with higher priority is more likely to become the master.	
| ```
[sw1]interface Vlanif 100
[sw1-Vlanif100]vrrp vrid 1 virtual-ip
10.1.1.254
[sw1-Vlanif100]vrrp vrid 1 priority
120
[sw1-Vlanif100]vrrp vrid 1 preempt-
mode timer delay 20
[sw1-Vlanif100]quit
``` | Here vrid of the virtual router composed of switch1 and switch2 |
| ```
[sw2]interface Vlanif 100
[sw2-Vlanif100]vrrp vrid 1 virtual-ip
10.1.1.254
[sw2-Vlanif100]quit
``` | Default priority is 100. |
`[sw2]display vrrp`	To view vrrp information.
VRRP Load Balance	
The load balancing monde has following characteristics: • Each backup group consists if a master device and multiple backup devices. • These backup groups can have different master devices. • A device can join multiple backup groups and obtain different priorities in each group.	
| ```
[sw1]interface Vlanif 100
[sw1-Vlanif100]vrrp vrid 1 virtual-ip
10.1.1.254
[sw1-Vlanif100]vrrp vrid 1 priority 120
[sw1-Vlanif100]vrrp vrid 1 preempt-mode timer
delay 20
[sw1-Vlanif100]quit
``` | |
| ```
[sw1]interface Vlanif 100
[sw1-Vlanif100]vrrp vrid 2 virtual-ip
10.1.1.253
[sw1-Vlanif100]quit
``` | |
| ```
[sw2]interface Vlanif 100
[sw2-Vlanif100]vrrp vrid 1 virtual-ip
10.1.1.254
[sw2-Vlanif100]quit
``` | |
| ```
[sw2]interface Vlanif 100
[sw2-Vlanif100]vrrp vrid 2 virtual-ip
10.1.1.253
[sw2-Vlanif100]vrrp vrid 2 priority 120
[sw2-Vlanif100]vrrp vrid 2 preempt-mode timer
delay 20
[sw2-Vlanif100]quit
``` | |

VRRP tracking interface	
VRRP can track the status of interfaces that are not enabled with vrrp. When the interface that is tracked by vrrp goes Up or Down, the priority of the device automatically changes by a certain value. • A VRRP backup group tracks a maximum of eight interfaces in two modes.	
``` [sw1]interface Vlanif 100 [sw1-Vlanif100]vrrp vrid 1 track interface GigabitEthernet 0/0/2 reduced 50 [sw1-Vlanif100]quit [sw1]display vrrp ```	Set the tracking interface and certain value.
VRRP fast Switchover	
Bidirectional forwarding detection (BFD) quickly detects connectivity of network links or IP routes. VRRP tracks BFD session status to perform fast switchover between master and backup devices within 1 second.	
[sw1]bfd [sw1-bfd]quit [sw1]bfd atob bind peer-ip 10.1.1.2 interface Vlanif 100 [sw1-bfd-session-atob]discriminator local 1 [sw1-bfd-session-atob]discriminator remote 2 [sw1-bfd-session-atob]commit [sw1-bfd-session-atob]quit	Enable BFD Set BFD peer interface ip Set discriminator. Local discriminator is set Remote discriminator is set.s
[sw2]bfd [sw2-bfd]quit [sw2]bfd btoa bind peer-ip 10.1.1.1 interface Vlanif 100 [sw2-bfd-session-btoa]discriminator local 2 [sw2-bfd-session-btoa]discriminator remote 1 [sw2-bfd-session-btoa]commit [sw2-bfd-session-btoa]quit	

BFD Command:
bfd session-name **bind peer-ip** ipaddress [**vpn-instance** vpn-name] **interface** interface-type interface-number [**source-ip** ip-address].

VRRP Command for backup	
quit	Quit command allows you to exit from the current view and return to the upper level view.
return	Return command or ctrl+z allows you to go to the user view.
Display current configuration	Display the current configuration of the device.
[Huawei]display user-interface	To check the user interface that a device supports
	By default, the next startup configuration file is named vrpcfg.zip
[Huawei]save backup.zip	Save the configuration file for backup
Saving configuration automatically	
Autosave time on	To enable schedule autosave
Autosave time 00:00:00	Specific time
Autosave interval on	To enable periodical autosaving.
Autosave interval time_in_minute	Time interval in minute. By default 1440 minute one day
[Huawei] startup saved-configuration backup.zip	
[Huawei] compare configuration	To compare the current configuration to compare with the next startup configuration.
Dir	To display the directory
Mkdir directory_name	To create a new directory
Cd	To change a directory
Copy	Copy a file
[Huawei] tftp 10.1.1.1 get devicesoft.cc	To download a file from ftp server
[Huawei] tftp 10.1.1.1 put devicesoft.cc	To upload a file to FTP server.
<Huawei>ftp 10.1.1.1 21	To login ftp server . It needs username passoword.
delete [/unreserved] [/force] filename	Deleting a file cannot be restored
<Huawei>undelete filename	To restore deleted file
<Huawei>reset recycle-bin	To delete all file in the recycle-bin
<Huawei>display startup	To check the statrtup files used for the next startup.
Save	Save the current configuration file
Reboot	Reboot the device
Schedule reboot at time_00:00:00	Reboot specific time

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