Dhcp:

dhcp is stands for dynamic host configuration protocol.it will allocate the ip automatically to the in a networks hosts.if you configure dhcp server you dont have to manually add the ip address .it is bery necessary for dynamic allocation. Because sometimes adding ip addrerss is tedious and sometimes there is problem assigned because if there is a lot of hosts it is very problematic for a network administrator to remember it and if someone comes to the netwoek it will be problametic to allocate the ip staticaly but it will be easy process if the dhcp exists.if new host come it will automatically allocate the unused ip to that host.

Cisco router command to create a dhcp:

1)first e have to assign an ip address to the router
2)then we have to define the network
3)then we can excluded the address form the network if we dont want to
include to our dhcp network

Router>enable

Router#configure terminal

Enter configuration commands, one per line. End with CNTL/Z.

Router(config)#do show ip interface

Router(config)#do show ip interface brief

Interface IP-Address OK? Method Status Protocol

GigabitEthernet0/0 unassigned YES unset administratively down down
GigabitEthernet0/1 unassigned YES unset administratively down down
GigabitEthernet0/2 unassigned YES unset administratively down down
Vlan1 unassigned YES unset administratively down down
Router(config)#interface GigabitEthernet0/0

Router(config-if)#ip address 192.169.0.1 255.255.255.0

Router(config-if)#no shutdown

%LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0, changed state to up

Router(config-if)#ip dhcp pool firstdhcp

Router(dhcp-config)#network 192.168.0.0 255.255.255.0

Router(dhcp-config)#default-router 192.168.0.1

Router(dhcp-config)#dns-server 8.8.8.8

Router(dhcp-config)#exit

Router(config)#ip dhcp excluded-address 192.168.0.50 192.168.0.254

Router(config)#exit

Configuring NTP server:

NTP stands for network time protocol .its a service that provide real time.for this we have to install ntp service in a server it will provide the current time to all the host inside the network.

Cisco router command for configuring NTP:

1)first you have to give the ip address it can be static and it can be dhcp
2)we will use as a dhcp so we will go for the dhcp approach

<div align="center">

ASSIGNIG IP PORTION
</div>

Router>enable

Router#configure terminal

Router(config)#do show ip interface

Router(config)#do show ip interface brief

Router(config)#interface GigabitEthernet0/0

Router(config-if)#ip address 192.168.0.1 255.255.255.0

Router(config-if)#no shutdown
Router(config-if)#exit

configuring dhcp portion

Router(config)#ip dhcp pool mydhcp   //mydhcp is just a name it can be
anything
Router(dhcp-config)#network 192.168.0.0 255.255.255.0   //defining the the network
Router(dhcp-config)#?   //in case you dont know the command

Router(dhcp-config)#default-router 192.168.0.1   // give the gateway

Router(dhcp-config)#dns-server 8.8.8.8   //adding dns server 8.8.8.8 is a global dns
Router(dhcp-config)#exit
Router(config)#ip dhcp excluded-address 192.168.0.100 192.168.0.150

Router(config)#exit
Router#

Router#wr

setting up the NTP service:
1)first add a server with the switch
2)adding ip address of the server can be static can be dhcp
3)go to the service and turn on the ntp service
3)then go the router adding the command

command:

Router>enable

Router>show clock

                                //it will defineatly shows wrong time

Router#configure terminal

Router(config)#ntp server 192.168.0.2   //the ip is the server ip

Router(config)#exit

Router#show clock

*23:54:54.479 UTC Sat Jun 9 2018   // now it will show you the correct time

RESOLVING HOSTNAME:
at precious we only work with the ip address we can add dns serviece which provide names insted of ip adddrss the.if the server is dns configured it can resolve the ip addrerss for specfic ip address so adding a dns server will let us work with the name insted of the ip address.

PROCESS FOR ADDING HOSTNAME:
1)first assign all the ip address
2)attach a server with the switch
3)add ip for that server
4)when adding ip the dns server ip will be our server ip not 8.8.8.8
4) then go the router and write this command line

Router>enable
Router#configure terminal
Router(config)#ip name
Router(config)#ip name-server <server-ip>   **//it will define the name server ip address**
Router(config)#exit
Router#wr

now we go to the servers dns service and add the name and the related ip address .and save then try to ping from the host server and the roure

ip routing:

To communicating one network with the other network without ip routing it is not ppossible. Because one network does not know other network .but if we use ip routing and make each other familier with each other then a host of one network can communicating with other network.

There are three types of routing:
* static routing
* default routing
*dynamic routing

static routing:

* configured by the administrator manually
* mandetory of defining the destination ip
* its secure and fast
* used for small organisation

Disadvantages:

* used for small network only
* everything is manual

process:

1)first create two different network with router,switch and host computer
2) then connect the two router with the serial cable
3) assingn all the ip address for each and every node
4)remember host of the different network will have different ip
if one has 192.168.0.1 other maybe 192.168.1.1
and the eciting ip of the router and the entering ip of a second router will be in the same network

router commmand to make ip routing:

1)first assign ip to the first router and the hosts;
2) second assign ip address to the second router and the hosts

3)connect two router with serial cable and give the exiting and entering ip address to;
3)go to the first router and type this command

first router:

Router1>enable
Router1#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router1(config)#ip route 192.168.1.0 255.255.255.0 10.0.0.2
//the syntax is ip route <other network ip> <other network subnet mask> <entry point of that network>
//in this case

    //192.168.1.0 ==>second network

    //255.255.255.0 ==> second network subnet

    //10.0.0.2 ==> second network entry point ip

Router1(config)#exit

then go to the second router:

Router2>enable
Router2#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router2(config)#ip route 192.168.0.0 255.255.255.0 10.0.0.1
//the syntax is ip route <other network ip> <other network subnet mask> <entry point of that network>
//in this case

    //192.168.0.0 ==>first network

    //255.255.255.0 ==> first network subnet

    //10.0.0.1 ==> first network entry point ip

Router2(config)#exit