

CISCO CCNA

MANUAL DE COMENZI



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Introducere

Felicitari pentru descarcarea acestui ghid. Asta arata ca esti interesat de domeniul IT si mai ales ca iti doresti sa dobandesti abilitati noi, sa cresti si sa te dezvolti profesional si personal.

Cu ajutorul acestui eBook vei fi capabil:

- Sa configurezi echipamente de Retea (Router, Switch) Cisco
- Sa faci troubleshooting-ul retelei folosind cateva comenzi esentiale
- Sa aplici notiunile de retelistica in scenarii practice

Aceasta carte include scenarii de configurare din diferite concepte precum:

- **Configurari de baza** ale Routerelor si a Switch-urilor
- **Protocolle de Retea** (OSPF, EIGRP, eBGP, RIP)
- **Switching** (VLANs, STPs, VTPs)
- **Redundanta** (HSRP, EtherChannel)
- **Securitate** (ACL, Security Switching, VPN), etc.

Te rog sa ai in vedere faptul ca toate comenziile functioneaza si au fost testat pana la versiunea 15.1 a Cisco IOS (Sistemul de Operare existent pe Routerele si Switch-urile Cisco). Daca intampini anumite probleme, te invit sa cauti pe Google rezolvarea lor.

Aceasta ghid este structurat in 4 capitole care cuprind diferite teme, apartinand comenziilor de baza pentru Cisco IOS. Aceasta carte acopera 90% din [comenziile din materia inclusa in CCNA](#). Daca iti doresti o cariera in Retele de Calculatoare, atunci iti recomand sa te axezi pe obtinerea acestei certificari, iar cea mai buna varianta este sa-ti dai certificarea **CCENT** (din materia CCNA 1 & 2).

Daca iti doresti sa inveti si mai multe despre Retele de Calculatoare si sa-ti dezvolti o cariera in directia asta, atunci [**iti recomand cursul meu online de Retele**](#) care te va duce pas cu pas prin notiunile de **care ai nevoie pentru a-ti lua certificarea CCENT si ulterior sa te angajezi in domeniu**.

Iti urez spor la treaba, iar daca ai intrebari nu ezita sa ma contactezi pe [email](#), [Facebook](#) sau [YouTube](#).

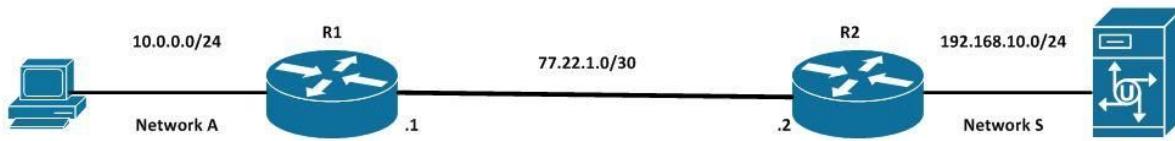
Ramon Nastase (cel care te sustine in procesul tau de crestere).

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Manual de Comenzi - CCNA Modulul 1

Sa presupunem ca pe parcursul acestei sectiuni avem urmatoarea topologie:



Comenzi de Baza

```

Router>                                         //prompt-ul initial de pe Router (user exec) >
Router>enable                                     //trecem in priviledge mode (#)
Router#
Router#configure terminal                     //trecem in modul global de configurare
Router(config)#
Router(config)#hostname R1                      //setam numele (hostname) echipamentului
R1(config)#
R1(config)#interface fastEthernet0/0          //intram pe interfata Fa0/0
R1(config-if)#ip address 192.168.1.1 255.255.255.0 //setam adresa IP pe interfata
R1(config-if)#no shutdown                      //pornim interfata
R1(config)#enable password AICI_INTRODUCI_PAROLA1 //setam parola de enable (#) in clear text
R1(config)#enable secret AICI_INTRODUCI_PAROLA2   //setam parola de enable (#) criptata
R1(config)#banner motd "UN MESAJ DE INTERZICERE A ACCES-ULUI pentru utilizatorii neautorizati"
    
```

Alte comenzi utile:

```
R1(config)#service password-encryption          //cripteaza parolele nesecurizate din running config  
R1(config)#ip domain-name nume_domeniu.ro      //seteaza un nume de domeniu  
R1(config)#ip domain-lookup                   //porneste rezolvarea de nume prin DNS (R1.nume.ro -> 10.0.0.1)
```

Configurare Telnet

```
R1(config)#line vty 0 4                      //5 conexiuni simultane prin retea la Router  
R1(config-line)#password cisco                //seteaza parola la login pentru Telnet  
R1(config-line)#login                         //porneste autentificarea folosind parola prin Telnet
```

Configurare SSH

```
R1(config)#username nume password parola_cisco    //creeaza user si parola  
R1(config)#ip domain-name invata-retelistica.ro     //seteaza domeniul  
R1(config)#crypto key generate rsa modulus 1024      //genereaza o pereche de chei (publice, private)  
1024 biti
```

R1(config)#**ip ssh version 2**

```
R1(config)#line vty 0 4                      //5 conexiuni simultane prin retea  
R1(config-line)#login local                  //autentificare folosind user si parola  
R1(config-line)#transport input ssh           //acces de la distanta numai prin SSH
```

Configurare Linie Consola

```
R1(config)#line console 0  
R1(config-line)#password AICI_INTRODUCI_PAROLA    //seteaza parola la consola  
R1(config-line)#login                           //porneste autentificarea
```

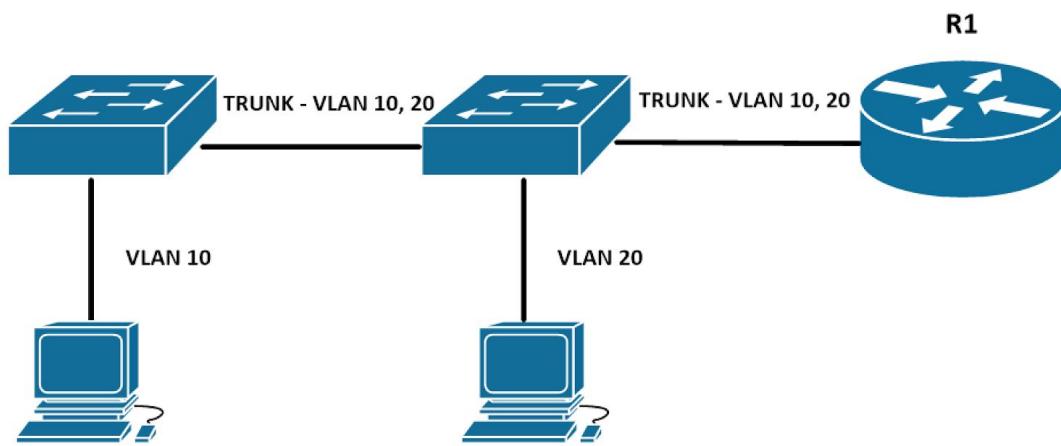
R1(config-line)#**logging synchronous** //sincronizeaza mesajele, newline dupa fiecare log
R1(config-line)#**exec-timeout 5** //expira dupa 5 minute

Verificare

R1#**show running-config** //ne arata config-ul de pe echipament
R1#**show ip interface brief** //ne arata interfetele, ipurile si starea lor (up/down)
R1#**show interfaces** //informatii la nivelul 2 (nr de pachete, erori pe port)
R1#**show ip interfaces** //ne arata detalii despre interfata la nivelul 3
R1#**show ip route** //tabela de rutare
R1#**show users** //user-ii conectati la echipament (SSH, Consola)

Manual de Comenzi - CCNA Modulul 2

1) SWITCHING



Configurare VLAN

```
SW1(config)#vlan 10                                //creeam un VLAN cu id-ul 10
SW1(config-vlan)# name HR                         //dam un nume acestui VLAN
SW1(config)#vlan 20
SW1(config-vlan)# name IT
```

Verificare

```
SW1#show vlan [brief]
```

Configurare Interfete Trunk & Access

```
SW1(config)#interface fastEthernet0/1
SW1(config-if)#switchport mode access                                //setam interfata in modul access
SW1(config-if)#switchport access vlan 10                               //in VLAN-ul 10

SW1(config)#interface fastEthernet0/24
SW1(config-if)#switchport trunk encapsulation dot1q
SW1(config-if)#switchport mode trunk                                 //setam interfata in modul trunk
                                                               //pentru VLAN 10 si 20
SW1(config-if)#switchport trunk allowed vlan 10,20
```

Verificare

```
SW1#show interfaces trunk
SW1#show run interface fa0/24
SW1#show interface fa0/24 switchport
```

Configurare Port Security

```
SW1(config)#interface Gi0/1
SW1(config-if)#switchport port-security                           //pornim securitatea pe port
SW1(config-if)#switchport port-security violation [shutdown | restrict | protect]
SW1(config-if)#switchport port-security mac-address sticky
SW1(config-if)#switchport port-security maximum 3                  //maxim 3 adrese MAC
```

Verificare

```
SW1#show port-security
```

Comenzi de Verificare pe Switch-uri

```
SW1#show vlan [brief]  
SW1#show interfaces fa0/1 switchport  
SW1#show interfaces trunk  
SW1#show run interface fa0/1  
SW1#show port-security [address]
```

Configurare Router-on-a-Stick (RoaS)

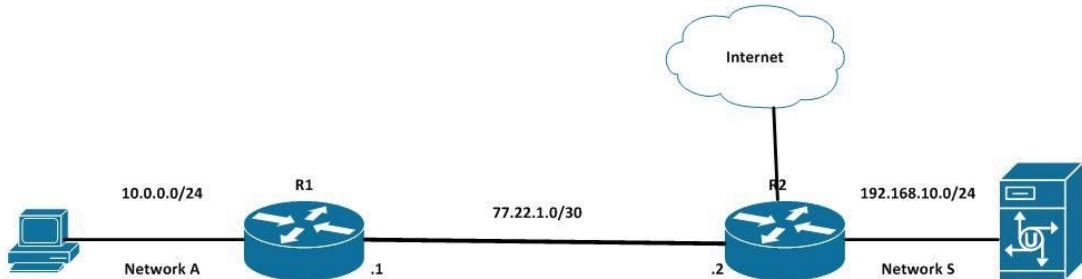
//Pentru VLAN-urile 10,20 si 599 (Native)

```
R1(config)#interface Gig0/0  
R1(config-if)#no shutdown                                //pornim interfata principală  
  
R1(config)#interface Gig0/0.10  
R1(config-if)#encapsulation dot1q 10                      //setam encapsularea ca fiind 802.1Q in VLAN 10  
R1(config-if)#ip address 10.5.10.1 255.255.255.0  
  
R1(config)#interface Gig0/0.20  
R1(config-if)#encapsulation dot1q 20                      //setam encapsularea ca fiind 802.1Q in VLAN 20  
R1(config-if)#ip address 10.5.20.1 255.255.255.0  
  
R1(config)#interface gig0/0.599  
R1(config-if)#encapsulation dot1q 599 native              //setam encapsularea folosind VLAN-ul Native  
R1(config-if)#ip address 10.5.99.1 255.255.255.0
```

Comenzi de Verificare Router pentru Inter-VLAN Routing

```
R1#show ip route  
R1#show ip interface brief
```

2) ROUTING



- IPv4

Configurare Rute Statische

```

R1(config)#ip route destination_network mask next_hop_IP
R1(config)#ip route 192.168.10.0 255.255.255.0 77.22.1.2
R1(config)#ip route 0.0.0.0 0.0.0.0 77.22.1.2           //ruta statica default (catre Internet)

```

Configurare RIPv2

```

R1(config)#router rip
R1(config-rtr)#version 2
R1(config-rtr)#no auto-summary
R1(config-rtr)#network 10.0.0.0                      //adresa IP retea direct conectata
R1(config-rtr)#default-information originate          //propaga ruta statica default (0.0.0.0/0)

```

Verificare

```

R1#show ip route
R1#show ip protocols
R1#show run | section [rip | route]

```

● IPv6

R1#**ipv6 unicast-routing** //pentru pornirea IPv6 pe echipamente

Setare Adresei IPv6

R1(config)#**interface Gig0/1**

R1(config-if)#**ipv6 address 2002:ABCD:1254::1/64**

Configurare Rute Statice

R1(config)#**ipv6 route destination_network/mask next_hop_IP**

R1(config)#**ipv6 route 2002:ABCD:1234::/64 2002:AAAA::1**

R1(config)#**ip route ::/0 2002:AAAA::1**

Configurare RIPng

R1(config)#**ipv6 router rip NUME** //creeam un proces RIPng (IPv6)

R1(config-rtr)#**exit**

R1(config-if)#**interface Gig0/0**

R1(config-if)#**ipv6 rip NUME enable** //pornim RIPng (IPv6) pe interfata

Verificare

R1#**show ipv6 route**

R1#**show ipv6 interface brief**

R1#**show ipv6 protocols**

R1#**show run | section route**

3) Servicii de Retea

Configurare DHCP pe Router/Switch-uri

```
R1(config)#ip dhcp excluded-address 10.0.0.1 10.0.0.10
```

```
R1(config)#ip dhcp pool NUME
```

```
R1(dhcp-config)#network 10.0.0.0 255.255.255.0
```

```
R1(dhcp-config)#default-router 10.0.0.1
```

```
R1(dhcp-config)#dns-server 8.8.8.8
```

Verificare

```
R1#show ip dhcp binding
```

```
R1#show run | section dhcp
```

Configurare ACL

- Standard ACL

Creare ACL:

```
R1(config)#ip access-list standard NUME_ACL
```

```
R1(config-std-nacl)#[permit | deny] IP_Source Wildcard_mask
```

```
R1(config-std-nacl)#deny 10.0.0.0 0.0.0.255 //opreste traficul pentru reteaua  
10.0.0.0/24
```

```
R1(config-std-nacl)#permit any //permitem restul traficului
```

Aplicare ACL pe Interfata:R1(config)#**interface** Gig0/0R1(config-if)#**ip access-group** *NUME_ACL* [**in** | **out**] //setam ACL pe interfata si directia filtrarii● **Extended ACL****Creare ACL:**R1(config)#**ip access-list extended** *NUME_ACL*R1(config-ext-nacl)#**[permit | deny]** [**IP | TCP | UDP**] **IP_Src** *Wildcard Port_Src* **IP_Dst** *Wildcard Port_Dst*R1(config-ext-nacl)#**deny ip** 10.0.0.0 0.0.0.255 **any** //opreste traficul sursa
10.0.0.0/24R1(config-ext-nacl)#**deny tcp host** 10.0.0.10 192.168.2.0 0.0.0.255 **eq 80** //opreste traficul
HTTPR1(config-ext-nacl)#**deny tcp host** 10.0.0.10 192.168.10.0 0.0.0.255 **eq 443** //opreste traficul
HTTPSR1(config-ext-nacl)#**permit ip any any****Aplicare ACL pe Interfata:**R1(config)#**interface** Gig0/0R1(config-if)#**ip access-group** *NUME_ACL* [**in** | **out**] //setam ACL pe interfata si directia de
filtrare**Verificare:**R1#**show ip access-list**

Configurare NAT

NAT Static:

```
R1(config)#ip nat inside source static 192.168.10.10 77.22.34.159
```

NAT Dinamic:

```
R1(config)#ip nat pool ADD_FOR_NAT 77.22.34.148 77.22.34.159
```

```
R1(config)#ip nat inside source list ACL_RETEA_NAT interface Gig0/0
```

NAT Overload (PAT):

```
R1(config)#ip nat inside source list ACL_RETEA_NAT interface Gig0/0 overload
```

Aplicare NAT pe interfata:

```
R1(config)#interface Gig0/1
```

```
R1(config-if)#ip nat NUME [inside | outside] // aplicam NAT pe interfete
```

// folosim **outside** (de obicei) pentru conexiunea cu Internet-ul / ISP

// **inside** pentru retelele internet

Verificare

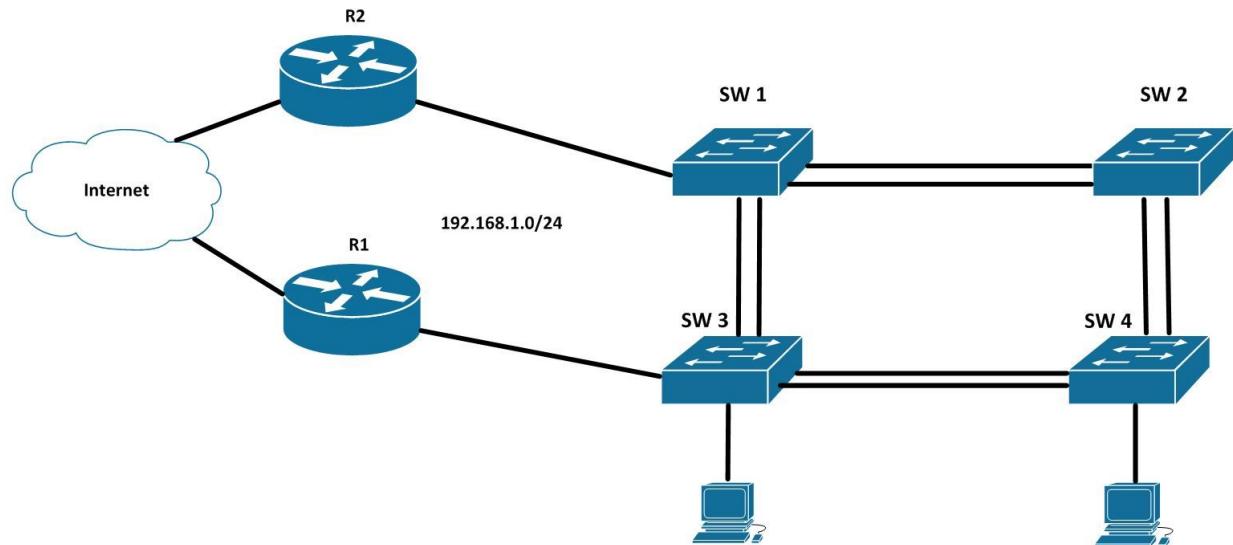
```
R1#show ip nat translation
```

```
R1#show run | section nat
```

Manual de Comenzi - CCNA Modulul 3

1) SWITCHING

Pentru acest modul de Switching vom folosi topologia de mai jos:



Configurare VTP

```

SW1(config)#vtp domain CISCO_DOMAIN           //cream un VLAN cu id-ul 10
SW1(config)#vtp mode [client | server | transparent] //dam un nume acestui VLAN
SW1(config)#vtp password cisco

```

Verificare:

```
SW1#show vtp [status | password]
```

```
R1#show run | section vtp
```

Configurare Spanning-Tree Protocol

```
SW1(config)#spanning-tree mode [pvst | rapid-pvst] //setam versiunea STP-ului - PVST / RPVST+
```

```
SW1(config)#spanning-tree vlan 10,20,30 [root | priority] //setam prioritatea unui Switch in STP
```

```
SW1(config)#interface Gi0/1
```

```
SW1(config-if)#switchport mode access
```

```
SW1(config-if)#switchport access vlan 10 //setam portul in VLAN-ul 10
```

```
SW1(config-if)#spanning-tree portfast //portul trece instant in FWD si opreste STP pe port
```

```
SW1(config-if)#spanning-tree vlan 10 port-priority 112 //schimba prioritatea STP pe port
```

Verificare:

```
SW1#show spanning-tree [vlan]
```

```
R1#show run | include spanning-tree
```

Configurare EtherChannel

NOTE: Cand vine vorba de EtherChannel ambele (sau toate cele 4,6, 8 etc.) port-uri trebuie sa aiba aceeasi configuratie:

SW1(config)#**interface range Gi0/1 - 2**

SW1(config-if)#**switchport trunk encapsulation dot1q**

SW1(config-if)#**switchport mode trunk**

SW1(config-if)#**switchport trunk allowed vlan 10,20,30**

//setam interfata in mod trunk pentru VLAN-uri

SW1(config-if)#**channel-group mode [active | passive]** //seteaza protocolul **LACP**

SW1(config-if)#**channel-group mode [desirable | auto]** //seteaza protocolul **PAgP** (Cisco)

SW1(config-if)#**channel-group mode on** //porneste manual EtherChannel

Verificare:

SW1#**show etherchannel [summary]**

R1#**show run | include channel-group**

Configurare HSRP

Pe cele 2 Routere din topologia de mai sus vom seta HSRP (protocol ce asigura redundanta in retea pe dispozitive Layer 3).

```
R1(config)#interface Gi0/1
```

```
R1(config-if)#standby <0-255> ip Group_IP_Address
```

```
R1(config-if)#standby <0-255> preempt
```

```
R1(config-if)#standby <0-255> priority 0-255
```

```
R1(config-if)#standby <0-255> track Gi0/1 Priority_Decrement_Number
```

```
R1(config)#interface Gi0/1
```

```
R1(config-if)#standby 1 ip 192.168.1.5 //setam adresa IP virtuala a grupului HSRP
```

```
R1(config-if)#standby 1 preempt //inlatura Routerul Activ daca prioritatea e mai mica
```

```
R1(config-if)#standby 1 priority 120 //setam prioritatea unui Router
```

```
R1(config-if)#standby 1 track Gi0/1 40 //scade prioritatea in caz de down a Gi0/1
```

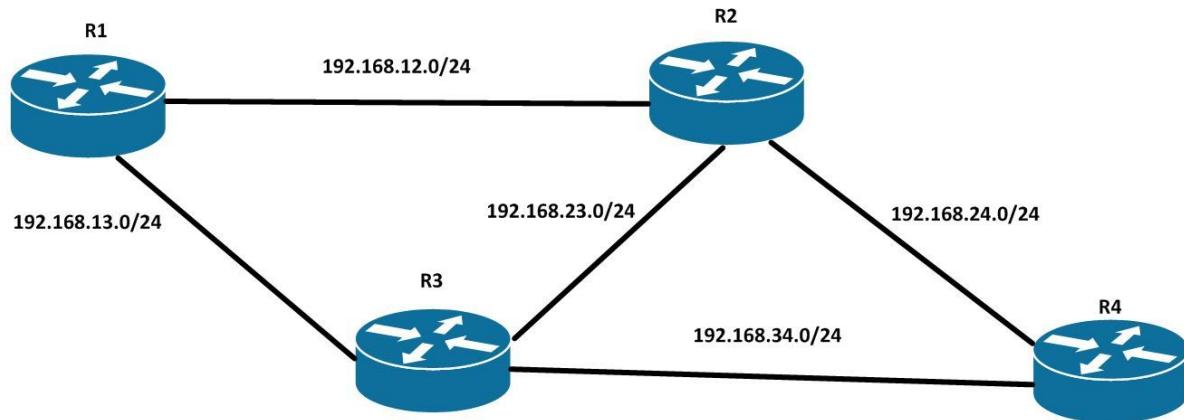
Verificare:

```
R1#show standby [brief]
```

```
R1#show run | section standby
```

2) ROUTING

Pentru acest modul de Routing vom folosi topologia de mai jos:



a) IPv4

Configurare OSPF

```
R1(config)#router ospf Process_ID
```

```
R1(router-config)#network IP_Retea Wildcard_Mask area Numarul_Ariei
```

```
R1(config)#router ospf 1 //poneste procesul OSPF pe Router
```

```
R1(router-config)#router-id 1.1.1.1
```

```
R1(router-config)#network 192.168.12.0 0.0.0.255 area 0 //poneste OSPF pentru retea in aria 0
```

```
R1(router-config)#network 192.168.13.0 0.0.0.255 area 0
```

Sau Setarea OSPF-ului pe Interfata

```
R1(config)#router ospf 1
```

```
R1(router-config)#exit
```

```
R1(config)#interface Gi0/0
```

```
R1(config-if)#ip ospf 1 area 0 //porneste OSPF in aria 0 pe interfata
```

```
R1(config-if)#ip ospf network [point-to-point | broadcast] //seteaza tipul interfetei in OSPFv3
```

OSPF Area Types

```
R1(config)#ip router ospf 1
```

```
R1(config-rtr)#area 1 stub //seteaza tipul ariei in modul STUB
```

```
R1(config-rtr)#area 1 stub no-summary //seteaza tipul ariei in modul Totally STUB
```

```
R1(config-rtr)#area 1 nssa [no-summary] //seteaza tipul ariei in modul NSSA
```

Verificare:

```
R1#show ip route
```

```
R1#show ip ospf neighbor
```

```
R1#show ip protocols
```

```
R1#show ip ospf interface Gi0/0
```

```
R1#show run | section ospf
```

Configurare EIGRP

```
R1(config)#router eigrp AS  
R1(router-config)#network IP_Retea Wildcard_Mask  
R1(router-config)#no auto-summary
```

```
R1(config)#router eigrp 123  
R1(router-config)#network 192.168.12.0 0.0.0.255  
R1(router-config)#network 192.168.13.0 0.0.0.255  
R1(router-config)#no auto-summary
```

#router eigrp **123**, in acest caz 123 reprezinta **AS-ul** (**Autonomous System**) si poate avea orice valoarea de la 1 la 65536. **Important** este ca acest **AS** sa fie **la fel** pe toate Routerele.

Verificare:

```
R1#show ip route  
R1#show ip eigrp neighbor  
R1#show ip protocols  
R1#show ip eigrp topology  
R1#show run | section eigrp
```

b) IPv6

NOTE: pe fiecare Router in parte trebuie data aceasta comanda: R1(config)#**ipv6 unicast-routing**

Configurare OSPFv3

```
R1(config)#ipv6 router ospf 1 //porneste procesul OSPFv3
```

```
R1(config-rtr)#exit
```

```
R1(config)#interface Gig0/0
```

```
R1(config-if)#ipv6 ospf 1 area 0 //porneste OSPFv3 pe interfata
```

```
R1(config-if)#ipv6 ospf network [point-to-point | broadcast] //seteaza tipul interfetei in OSPFv3
```

OSPF Area Types

```
R1(config)#ipv6 router ospf 1
```

```
R1(config-rtr)#area 1 stub //seteaza tipul ariei in modul STUB
```

```
R1(config-rtr)#area 1 stub no-summary //seteaza tipul ariei in modul Totally  
STUB
```

```
R1(config-rtr)#area 1 nssa [no-summary] //seteaza tipul ariei in modul NSSA
```

Verificare:

```
R1#show ipv6 route
```

```
R1#show ipv6 ospf neighbor
```

```
R1#show ipv6 protocols
```

```
R1#show ipv6 ospf database
```

```
R1#show run | section ospf
```

Configurare EIGRPv6

```
R1(config)#ipv6 router eigrp 123 //creeaza si porneste procesul EIGRPv6
```

```
R1(router-config)#no shutdown
```

```
R1(config)#interface Gig0/0
```

```
R1(config-if)#ipv6 eigrp 123 //adauga reteaua (interfata) in EIGRPv6
```

```
R1(config)#interface Gig0/1
```

```
R1(config-if)#ipv6 eigrp 123
```

Verificare:

```
R1#show ipv6 route
```

```
R1#show ipv6 eigrp neighbor
```

```
R1#show ipv6 protocols
```

```
R1#show ipv6 eigrp topology
```

```
R1#show run | section eigrp
```

Manual de Comenzi - CCNA Modulul 4

Configurare PPP



```
R1(config)#interface Serial0/0/1
```

```
R1(config-if)#encapsulation ppp
```

//pornim PPP pe interfata

PPP Autentificare prin PAP

Configul pe R1:

```
R1(config)#username R1 password cisco
```

//cream un username si o parola

```
R1(config)#interface Serial0/0/1
```

```
R1(config-if)#ppp authentication pap
```

//pornim autentificarea prin PAP

```
R1(config-if)#ppp pap sent-username R2 password cisco
```

//setam user-ul si parola pentru PAP

Configul pe R2:

```
R2(config)#username R2 password cisco
```

```
R2(config)#interface Serial0/0/0
```

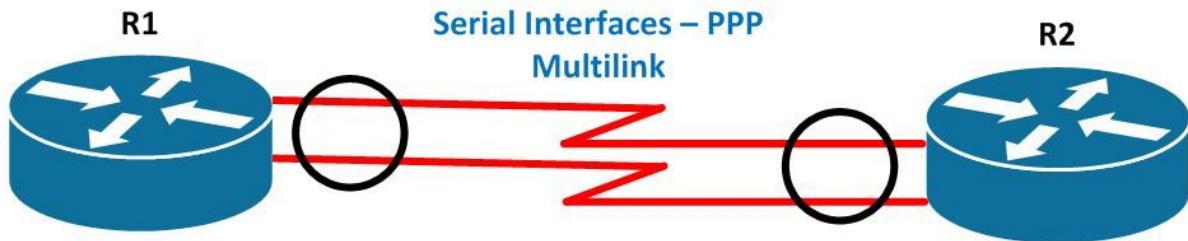
```
R2(config-if)#ppp authentication pap
```

```
R2(config-if)#ppp pap sent-username R1 password cisco
```

PPP Autentificare prin CHAP

```
R1(config)#username R1 password cisco          //cream un username si o parola
R1(config)#interface Serial0/0/1
R1(config-if)# ppp authentication chap        //pornim autentificarea prin CHAP
```

Configurare PPP Multilink



```
R1(config)#interface Serial0/0/1
R1(config-if)#no ip address                  //se elimina adresa IP pentru ca va fi pe interfata principala (Multilink 1)
R1(config-if)#ppp multilink                 //formarea unui grup Multilink si asocierea cu acesta
R1(config-if)#ppp multilink group 1

R1(config)#interface Serial0/0/0
R1(config-if)#no ip address
R1(config-if)#ppp multilink                 //formarea unui grup Multilink si asocierea cu acesta
R1(config-if)#ppp multilink group 1

R1(config)#interface Multilink 1
R1(config-if)#ip address 192.168.1.1 255.255.255.0
```

Verificare:

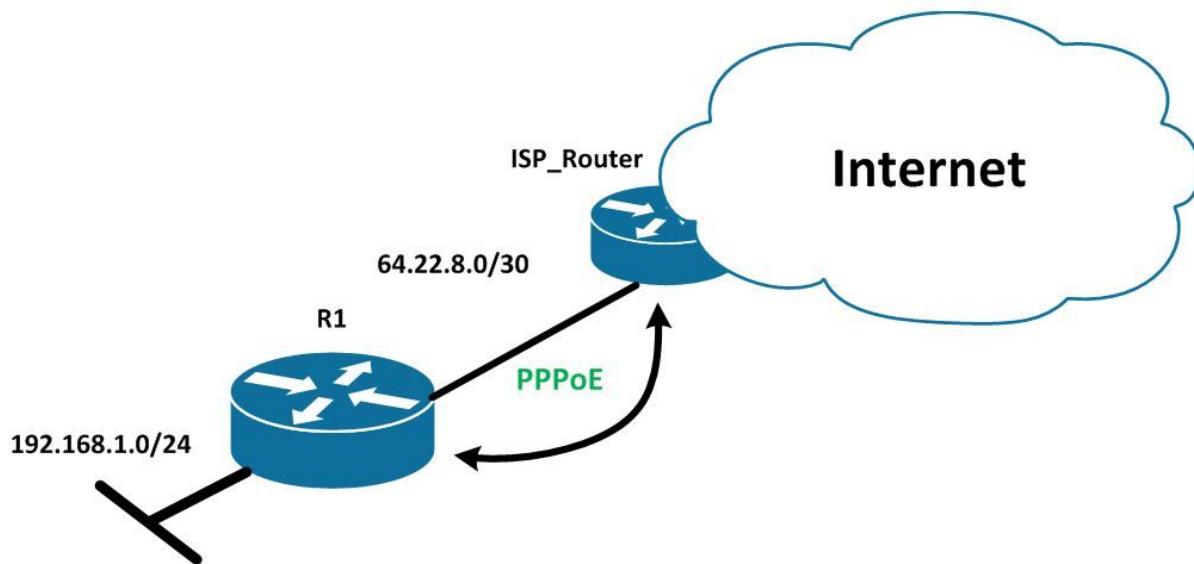
R1#**show interface Serial0/0/1**

R1#**show ip interface brief** //verificam daca interfata este up up

R1#**show ppp multilink**

R1#**debug ppp negotiation**

Configurare PPPoE



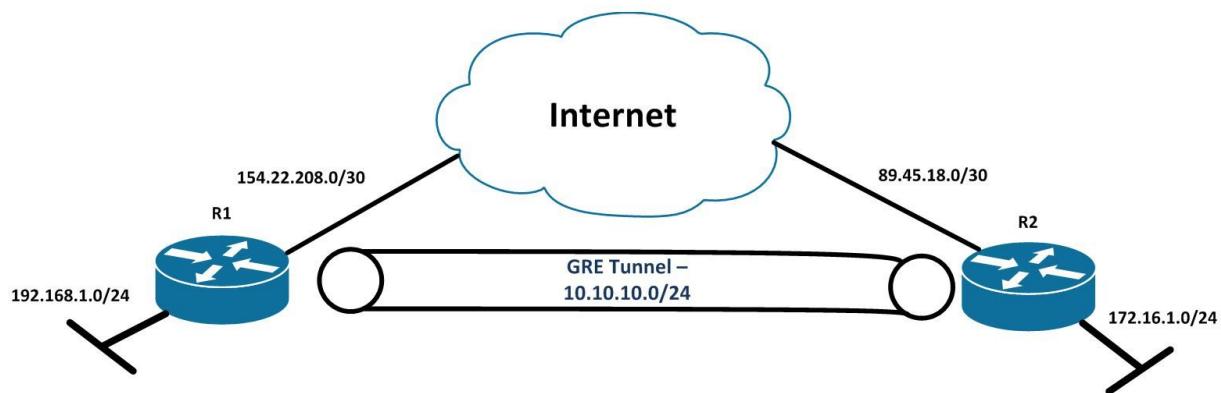
```
R1(config)#interface Dialer 1
R1(config-if)#ip mtu 1492
R1(config-if)#ip address negotiated
R1(config-if)#encapsulation ppp
R1(config-if)#dialer pool 1
R1(config-if)#ppp authentication chap
R1(config-if)#ppp chap hostname ID_ISP
R1(config-if)#ppp chap password ParolaS#CretA
```

Verificare:

```
R1#show ip interface brief
R1#show pppoe session
R1#debug ppp negotiation
```

Tunelare prin GRE si VPN site-to-site

In exemplul de mai jos vom configura, in primul rand, un tunel GRE intre cele 2 Routere, R1 si R2, iar in al doilea rand vom configura un tunel securizat (VPN) intre cele 2 retele.



Configurare Tunel GRE

```
R1(config)#interface Tunnel1
```

```
R1(config-if)# ip address 172.16.1.1 255.255.255.0
```

```
R1(config-if)# ip mtu 1400
```

```
R1(config-if)# ip tcp adjust-mss 1360
```

```
R1(config-if)# tunnel source 1.1.1.1
```

```
R1(config-if)# tunnel destination 2.2.2.2
```

Verificare:

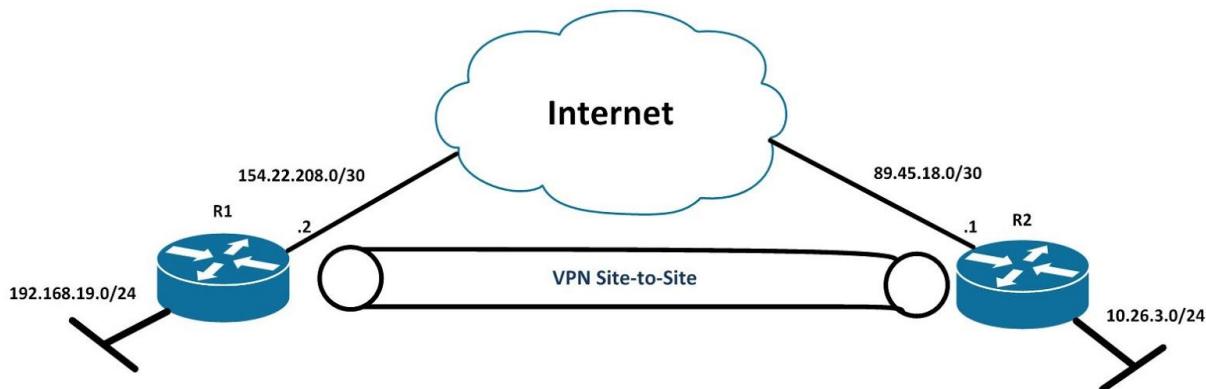
```
R1#show ip interface brief
```

```
R1#show ip interface Tunnel1
```

```
R1#show run | section Tunnel1
```

Configurare IPSec VPN (Site-to-Site)

Acum vom configura un tunel *VPN IPSec* intre cele 2 Routere.



==IKE Phase 1==

```
R1(config)#crypto isakmp policy 10
R1(config-isakmp)#encryption aes
R1(config-isakmp)#hash sha512
R1(config-isakmp)#authentication pre-share
R1(config-isakmp)#group 5
```

```
R1(config)#ip access-list extended VPN-ACL
```

```
R1(config-ext-nacl)#permit ip 10.1.0.0 0.0.0.255 10.2.0.0 0.0.0.255
R1(config)#crypto isakmp key InvataRetelisticaKEY address 10.0.0.0 255.255.255.0
```

==IKE Phase 2==

```
R1(config)#crypto ipsec transform-set NUME-SET esp-aes 256 esp-sha384-hmac
R1(cfg-crypto-trans)#mode [tunnel | transport] - cripteaza de la Layer 3 (IP) in sus
```

```
R1(config)#crypto map NUME-MAP 10 ipsec-isakmp
R1(config-crypto-map)#match address VPN-ACL
R1(config-crypto-map)#set peer 10.0.0.2
R1(config-crypto-map)#set transform-set NUME-SET
```

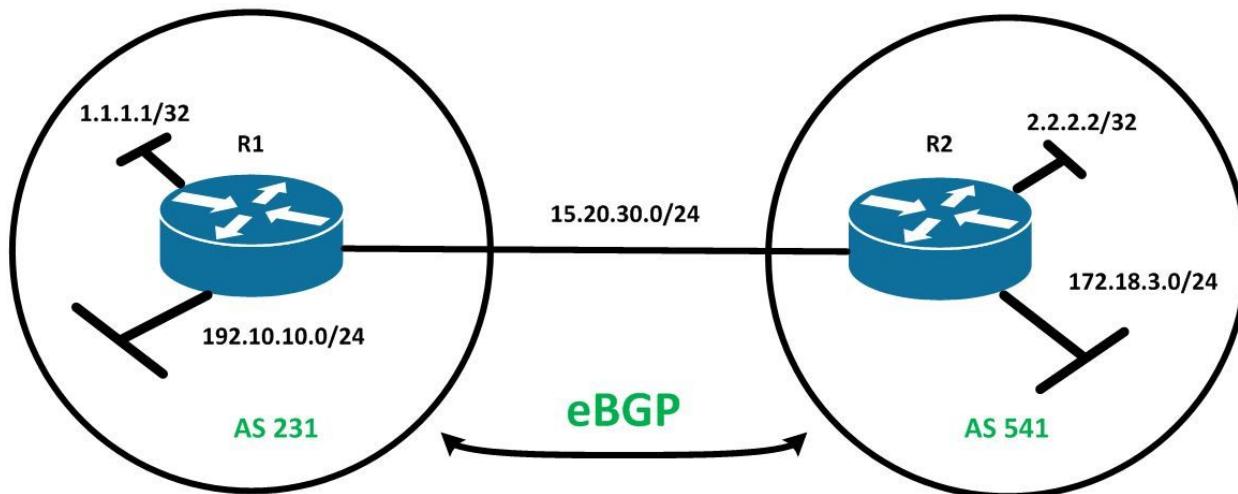
```
R1(config)#interface Gi0/0
R1(config-if)#crypto map NUME-MAP
```

Verificare:

```
R1#show crypto ipsec sa
```

```
R1#show crypto isakmp sa
```

```
R1#debug crypto [isakmp | ipsec]
```

Configurare eBGP

```
R1(config)#router bgp AS
```

```
R1(config-rtr)#neighbor X.Y.Z.W remote-as Neighbor_AS
```

```
R1(config-rtr)#network Network_address mask 255.255.255.0
```

```
R1(config-rtr)#neighbor X.Y.Z.W ebgp-multipath 5
```

```
R1(config-rtr)#neighbor X.Y.Z.W update-source Loopback 1
```

```
R1(config)#interface Loopback 1
```

```
R1(config-if)#ip address 1.1.1.1 255.255.255.0
```

```
R1(config)#ip route 2.2.2.2 255.255.255.0 15.20.30.10
```

```
R1(config)#router bgp 231
R1(config-rtr)#neighbor 2.2.2.2 remote-as 541
R1(config-rtr)#neighbor 2.2.2.2 ebgp-multipath 5
R1(config-rtr)#neighbor 2.2.2.2 update-source Loopback 1
R1(config-rtr)#network 192.10.10.0 mask 255.255.255.0
```

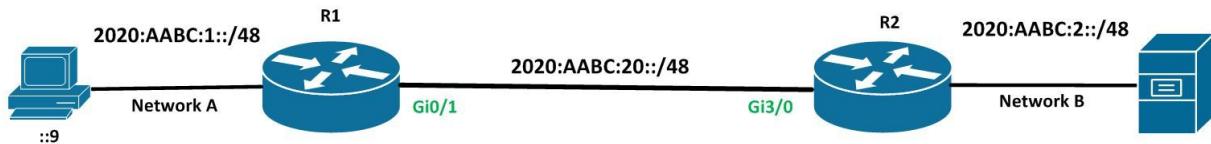
```
R2(config)#interface Loopback 1
R2(config-if)#ip address 2.2.2.2 255.255.255.0
R2(config)#ip route 1.1.1.1 255.255.255.0 15.20.30.5
```

```
R2(config)#router bgp 541
R2(config-rtr)#neighbor 1.1.1.1 remote-as 231
R2(config-rtr)#neighbor 1.1.1.1 ebgp-multipath 5
R2(config-rtr)#neighbor 1.1.1.1 update-source Loopback 1
R2(config-rtr)#network 172.18.3.0 mask 255.255.255.0
```

Verificare:

```
R1#show ip route
R1#show ip bgp //ne arata rutele invatate prin BGP
R1#show ip bgp summary //ne arata Routerele vecine din BGP
```

Configurare ACL pe IPv6



```
R2(config)#ipv6 access-list NUME_ACL
```

```
R2(config-ipv6-acl)#permit tcp 2020:AABC:1::/48 any eq 80
```

```
R2(config-ipv6-acl)#deny udp host 2020:AABC:1::9 eq 53 any
```

```
R2(config-ipv6-acl)#deny ipv6 any any
```

```
R2(config)#interface Gig0/1
```

```
R2(config-if)#ipv6 traffic-filter NUME_ACL [in | out]
```

Pentru linile VTY:

```
R1(config)#line vty 0 15
```

```
R1(config-line)#ipv6 access-class NUME_ACL_SSH_TELNET in
```

Verificare:

```
R1#show ipv6 access-list
```

```
R1#show run | section ipv6 access-list
```

Configurare SNMP

```
R1(config)# access-list standard 1 permit 192.168.1.10
```

```
R1(config)#snmp-server view NUME_VIEW oid-tree {included | excluded}
```

```
R1(config)#snmp-server group NUME_GRUP v3 priv read NUME_VIEW access 1
```

```
R1(config)#snmp-server user USERNAME NUME_GRUP v3 auth {md5 | sha}  
auth-password priv {des | 3des | aes {128 | 192 | 256}} privpassword
```

Configurare SPAN (Switchport Analyzer)

```
SW1(config)#monitor session 1 source interface GigabitEthernet 0/1
```

```
SW1(config)#monitor session 1 destination interface GigabitEthernet 0/5
```

Verificare:

```
SW1#show monitor
```

Configurare IP SLA

```
R1(config)#ip sla 1
```

```
R1(config-ip-sla)#icmp-echo 192.168.1.5
```

```
R1(config-ip-sla-echo)#frequency 30
```

```
R1(config)#ip sla schedule 1 start-time now lifetime
```

Verificare:

```
R1#show ip sla configuration
```

```
R1#show ip sla statistics
```