DHCP

DHCP

Dynamic Host Configuration Protocol

Alocă dinamic staţiilor din LAN parametrii necesari pentru conectivitate (IP, Subnet Mask, Default Gateway,DNS, etc…)

Uşurează configurarea unei reţele cu un număr mare de hosturi

Evoluat din BOOTP (Bootstrap Protocol)

DHCP vs BOOTP

BOOTP	DHCP
Mapare statică (după MAC)	Mapare dinamică
Atribuire permanentă	Lease (“închiriere” a adresei)
4 parametri	> 30 de parametri

Parametrii configurabili

IP

Subnet Mask

Default gateway (default router)

DNS servers

Domain name

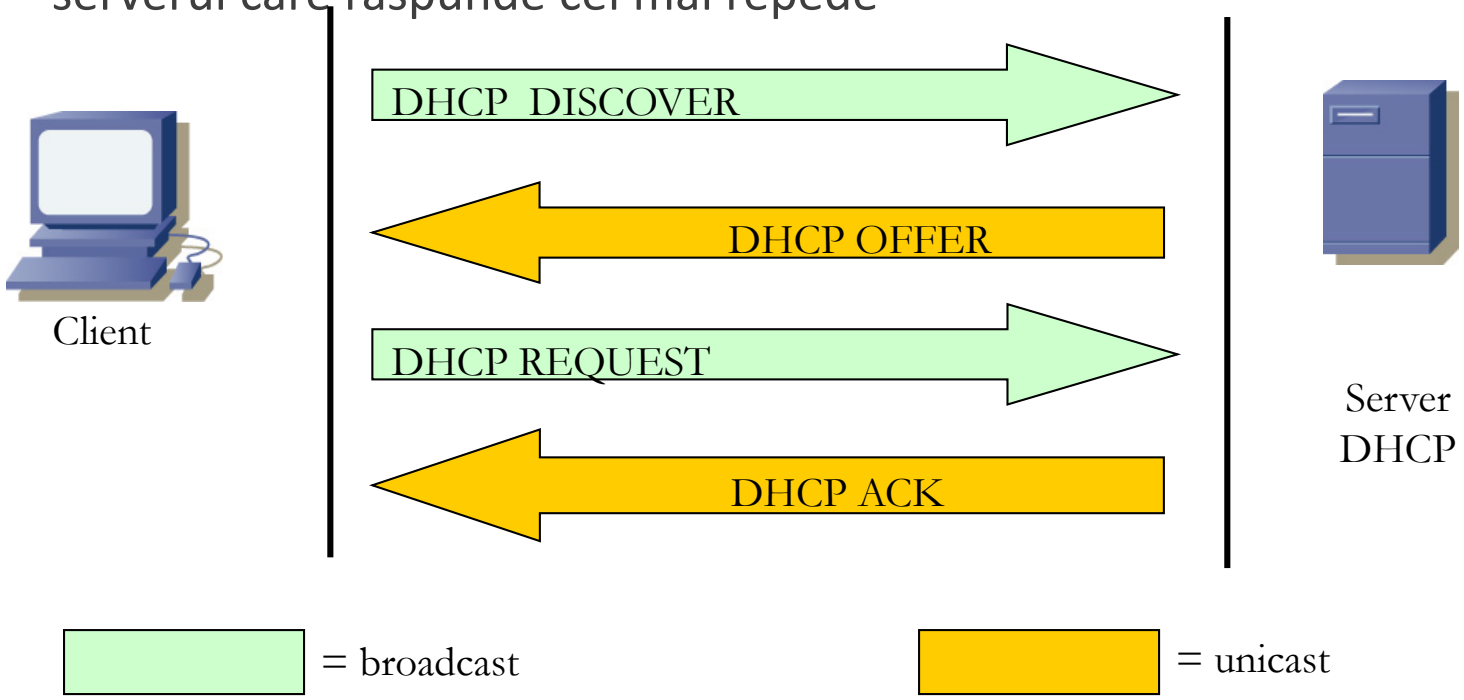
WINS Server

alţi parametri configurabili

Închirierea unei adrese IP

DHCP foloseşte porturile UDP 67 (client) şi 68 (server)

În cazul existenţei mai multor servere în reţea, clientul va primi adresa de la serverul care răspunde cel mai repede



Mesajul DHCP

Compatibilitate cu BOOTP

Opţiunile DHCP oferă mai multe functionalităţi decât BOOTP

8	16	24	32
OP Code (1)	Hardware type (1)	Hardware address length (1)	Hops (1)
Transaction Identifier			
Seconds – 2 bytes		Flags – 2 bytes	
Client IP Address (CIADDR) – 4 bytes			
Your IP Address (YIADDR) – 4 bytes			
Server IP Address (SIADDR) – 4 bytes			
Gateway IP Address (GIADDR) – 4 bytes			
Client Hardware Address (CHADDR) – 16 bytes			
Server name (SNAME) – 64 bytes			
Filename – 128 bytes			
DHCP Options – variable			

Configurare(1)

Activarea serviciului

```
R(config)#service dhcp
```

Excluderea de adrese

```
R(config)#ip dhcp excluded-address <addr> [end-addr]
```

Configurare(2)

Crearea unui pool

```
R(config)#ip dhcp pool <pool-name>
```

Definirea parametrilor de configurare

```
R(dhcp-config)#network <ip-address> <subnet-mask>
R(dhcp-config)#default-router <router-address>
R(dhcp-config)#dns <dns-address>
R(dhcp-config)#netbios-name-server <netbios-address>
R(dhcp-config)#domain-name <name>
```

Configurare(3)

Task	IOS Command
Define the address pool.	**network** *network-number* [*mask* | */ prefix-length*]
Define the default router or gateway.	**default-router** address [*address2….address8*]
Define a DNS server.	**dns-server** *address* [*address2…address8*]
Define the domain name.	**domain-name** *domain*
Define the duration of the DHCP lease.	**lease** {*days* [*hours* [*minutes*]] | **infinite**}
Define the NetBIOS WINS server.	**netbios-name-server** *address* [*address2…address8*]

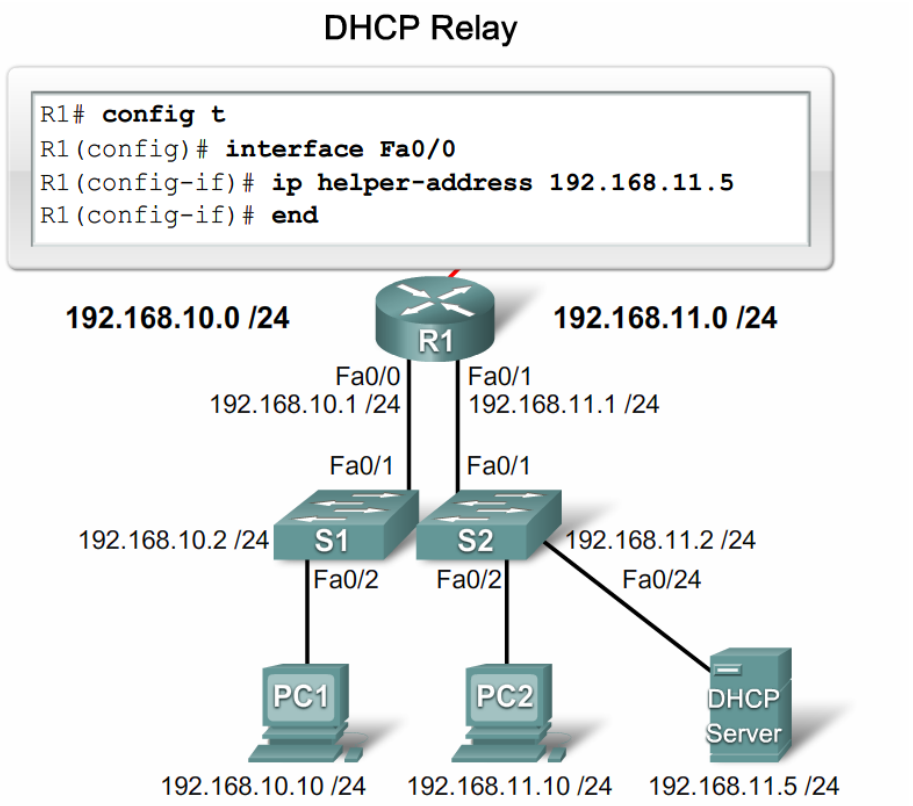
DHCP Relay

Situaţie: serverul DHCP nu se află în aceeaşi reţea cu clienţii

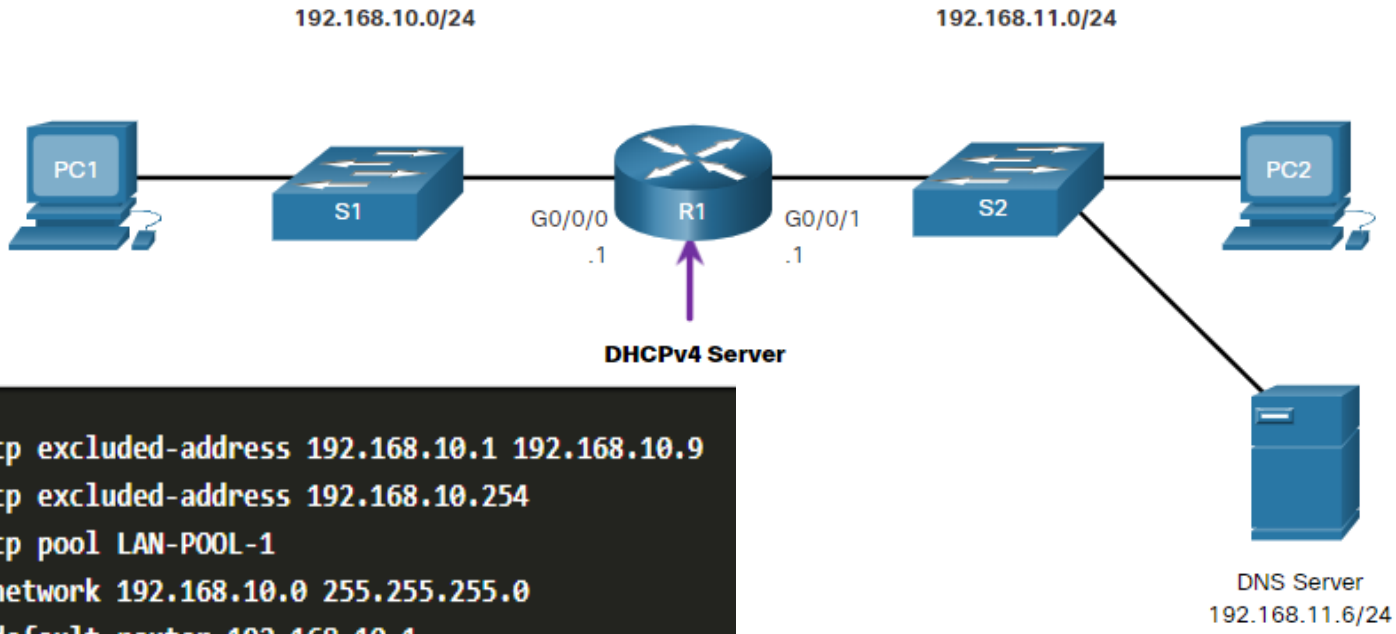
Problemă: router-ele nu vor forwarda broadcast-urile clienţilor

Soluţia:

`ip helper-address`



Exemplu




```
R1(config)# ip dhcp excluded-address 192.168.10.1 192.168.10.9
R1(config)# ip dhcp excluded-address 192.168.10.254
R1(config)# ip dhcp pool LAN-POOL-1
R1(dhcp-config)# network 192.168.10.0 255.255.255.0
R1(dhcp-config)# default-router 192.168.10.1
R1(dhcp-config)# dns-server 192.168.11.5
R1(dhcp-config)# domain-name example.com
R1(dhcp-config)# end
R1#
```

Depanare

Listă cu adresele atribuite:

```
R#show ip dhcp binding
```

Mesaje DHCP

```
R#show ip dhcp server statistics
```

Procesul de alocare a adreselor IP

```
R#debug ip dhcp server events
```

Verificare DHCP

```
R1# show running-config | section dhcp
ip dhcp excluded-address 192.168.10.1 192.168.10.9
ip dhcp excluded-address 192.168.10.254
ip dhcp pool LAN-POOL-1
 network 192.168.10.0 255.255.255.0
 default-router 192.168.10.1
 dns-server 192.168.11.5
 domain-name example.com
```

Verificare DHCP

```
R1# show ip dhcp binding
Bindings from all pools not associated with VRF:
IP address      Client-ID/              Lease expiration        Type       State      Interface
                Hardware address/
                User name
192.168.10.10   0100.5056.b3ed.d8       Sep 15 2019 8:42 AM    Automatic  Active
GigabitEthernet0/0/0
```

Verificare DHCP

```
R1# show ip dhcp server statistics
Memory usage              19465
Address pools             1
Database agents           0
Automatic bindings        2
Manual bindings           0
Expired bindings          0
Malformed messages        0
Secure arp entries        0
Renew messages            0
Workspace timeouts        0
Static routes             0
Relay bindings            0
Relay bindings active             0
Relay bindings terminated         0
Relay bindings selecting          0
Message                   Received
BOOTREQUEST               0
DHCPDISCOVER              4
DHCPREQUEST               2
DHCPDECLINE               0
DHCPRELEASE               0
DHCPINFORM                0
```

Verificare DHCP

```
C:\Users\Student> ipconfig /all
Windows IP Configuration
   Host Name . . . . . . . . . . . . : ciscolab
   Primary Dns Suffix  . . . . . . . :
   Node Type . . . . . . . . . . . . : Hybrid
   IP Routing Enabled. . . . . . . . : No
   WINS Proxy Enabled. . . . . . . . : No
Ethernet adapter Ethernet0:
   Connection-specific DNS Suffix  . : example.com
   Description . . . . . . . . . . . : Realtek PCIe GBE Family Controller
   Physical Address. . . . . . . . . : 00-05-9A-3C-7A-00
   DHCP Enabled. . . . . . . . . . . : Yes
   Autoconfiguration Enabled . . . . : Yes
   IPv4 Address. . . . . . . . . . . : 192.168.10.10
   Subnet Mask . . . . . . . . . . . : 255.255.255.0
   Lease Obtained  . . . . . . . . . : Saturday, September 14, 2019 8:42:22AM
   Lease Expires   . . . . . . . . . : Sunday, September 15, 2019 8:42:22AM
   Default Gateway . . . . . . . . . : 192.168.10.1
   DHCP Server . . . . . . . . . . . : 192.168.10.1
   DNS Servers . . . . . . . . . . . : 192.168.11.5
```

Exemple configurare

```
SOHO(config)# interface G0/0/1
SOHO(config-if)# ip address dhcp
SOHO(config-if)# no shutdown
Sep 12 10:01:25.773: %DHCP-6-ADDRESS_ASSIGN: Interface GigabitEthernet0/0/1 assigned DHCP address
209.165.201.12, mask 255.255.255.224, hostname SOHO
```

```
SOHO# show ip interface g0/0/1
GigabitEthernet0/0/1 is up, line protocol is up
  Internet address is 209.165.201.12/27
  Broadcast address is 255.255.255.255
  Address determined by DHCP
(output omitted)
```