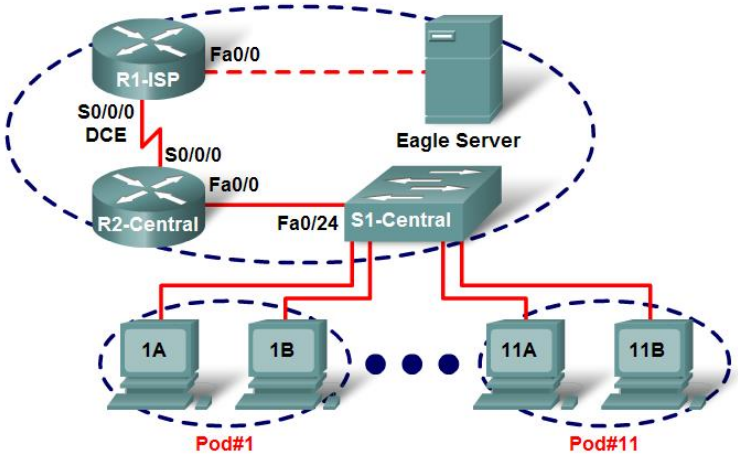
RAČUNARSKE MREŽE

10.1 – Planiranje i kabliranje mreže

Uvod

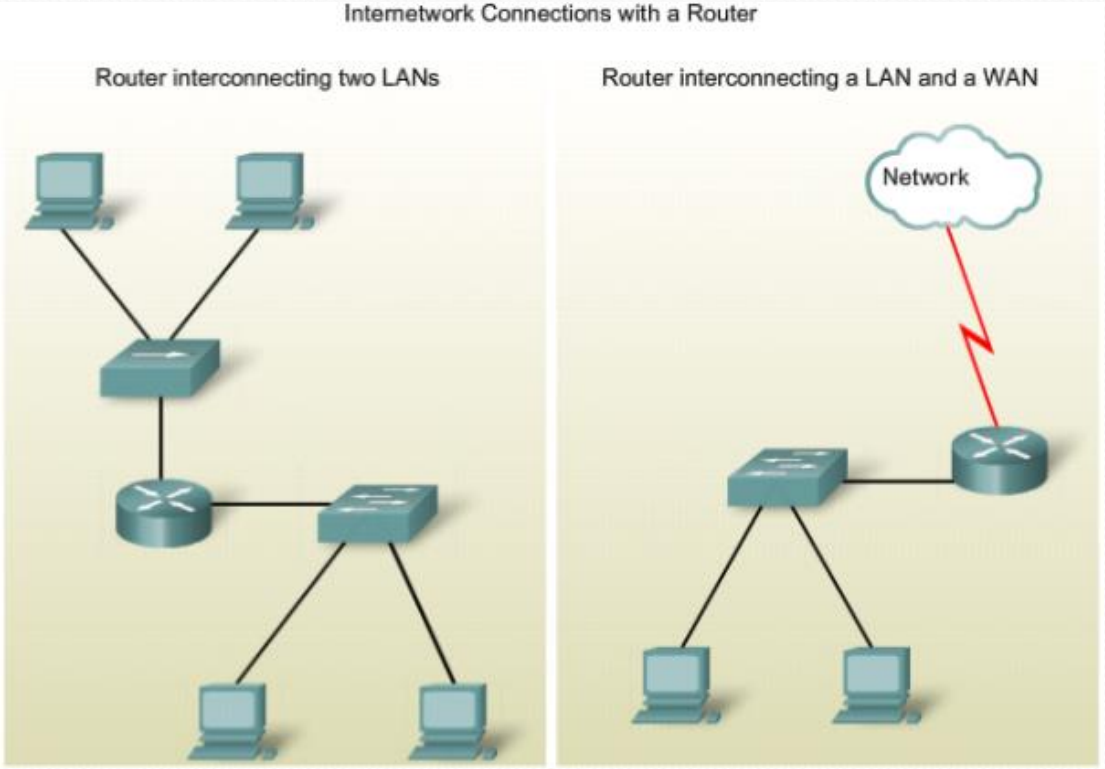
- Prije korištenja usluga mreže, prvo moramo povezati uređaje



Planning & Cabling a Network

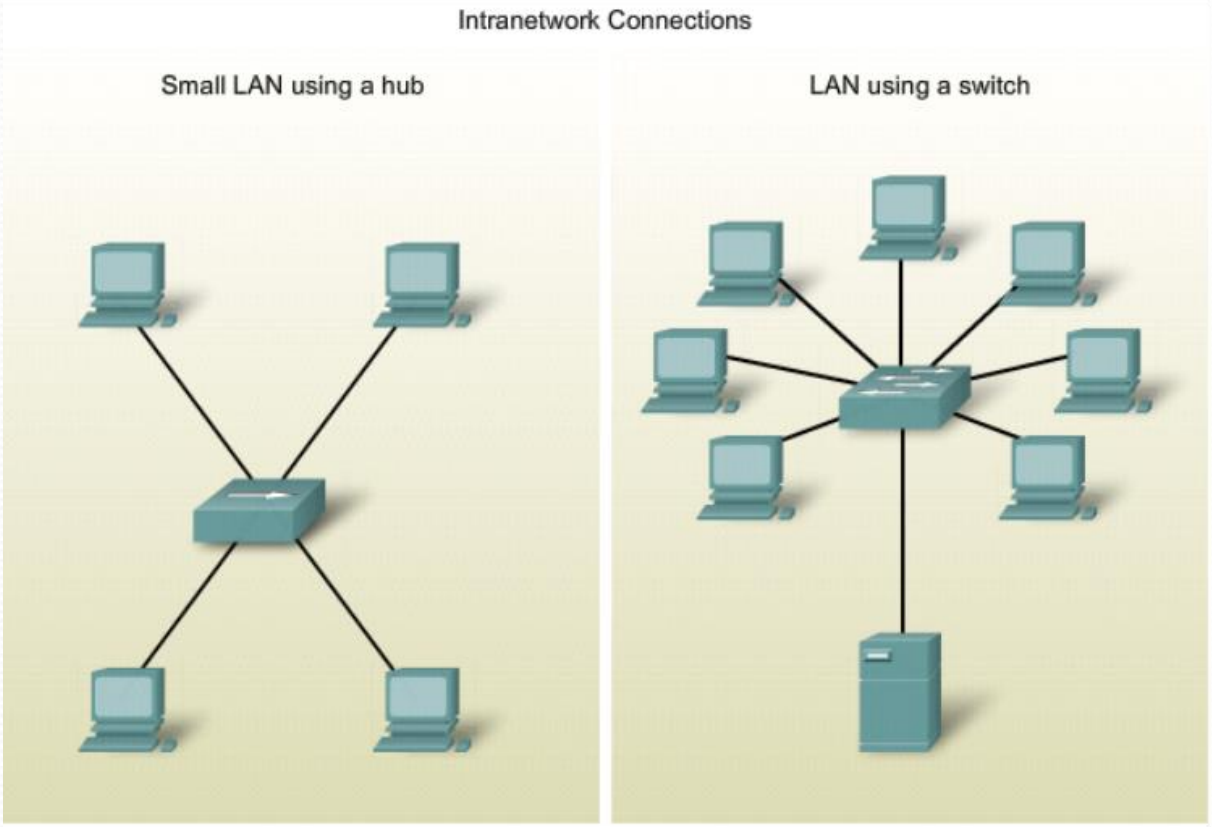
Odabir odgovarajućeg LAN uređaja

- Međumrežna (eng. *internetwork*) konekcija – ruteri, značaj i u LAN-u
- Svaki port predstavlja zasebnu mrežu, razbijaju i kolizione i *broadcast* domene
- Povezuju različite tehnologije (mogu imati i LAN i WAN interfejse)



Odabir odgovarajućeg LAN uređaja(2)

- Mrežna (eng. *intranetwork)* konekcija – hub i switch
- Kolizioni domeni, BW, cijena

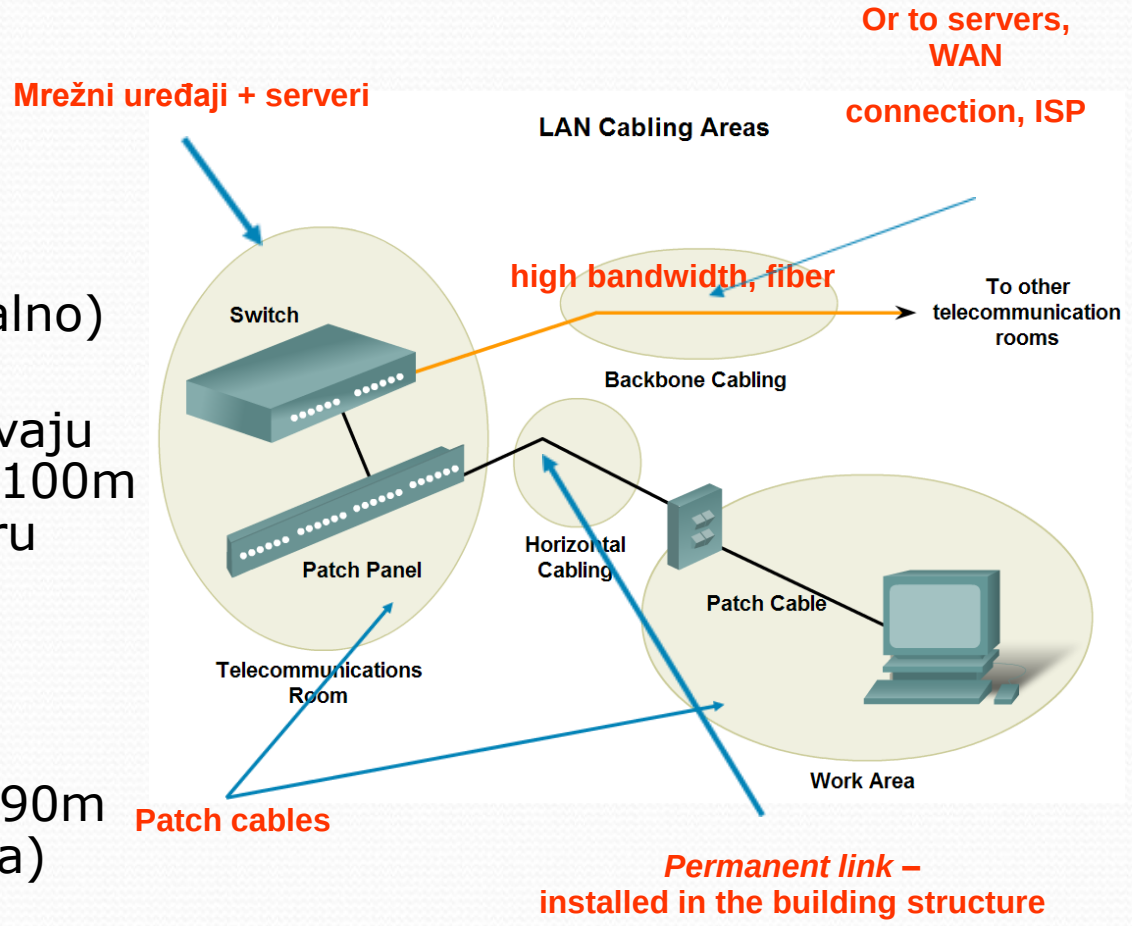


LAN povezivanje

- 4 fizičke oblasti:

1. Radna
2. Distribuciona
3. *backbone* (vertikalno) kabliranje
4. distribuciono (horizontalno) kabliranje

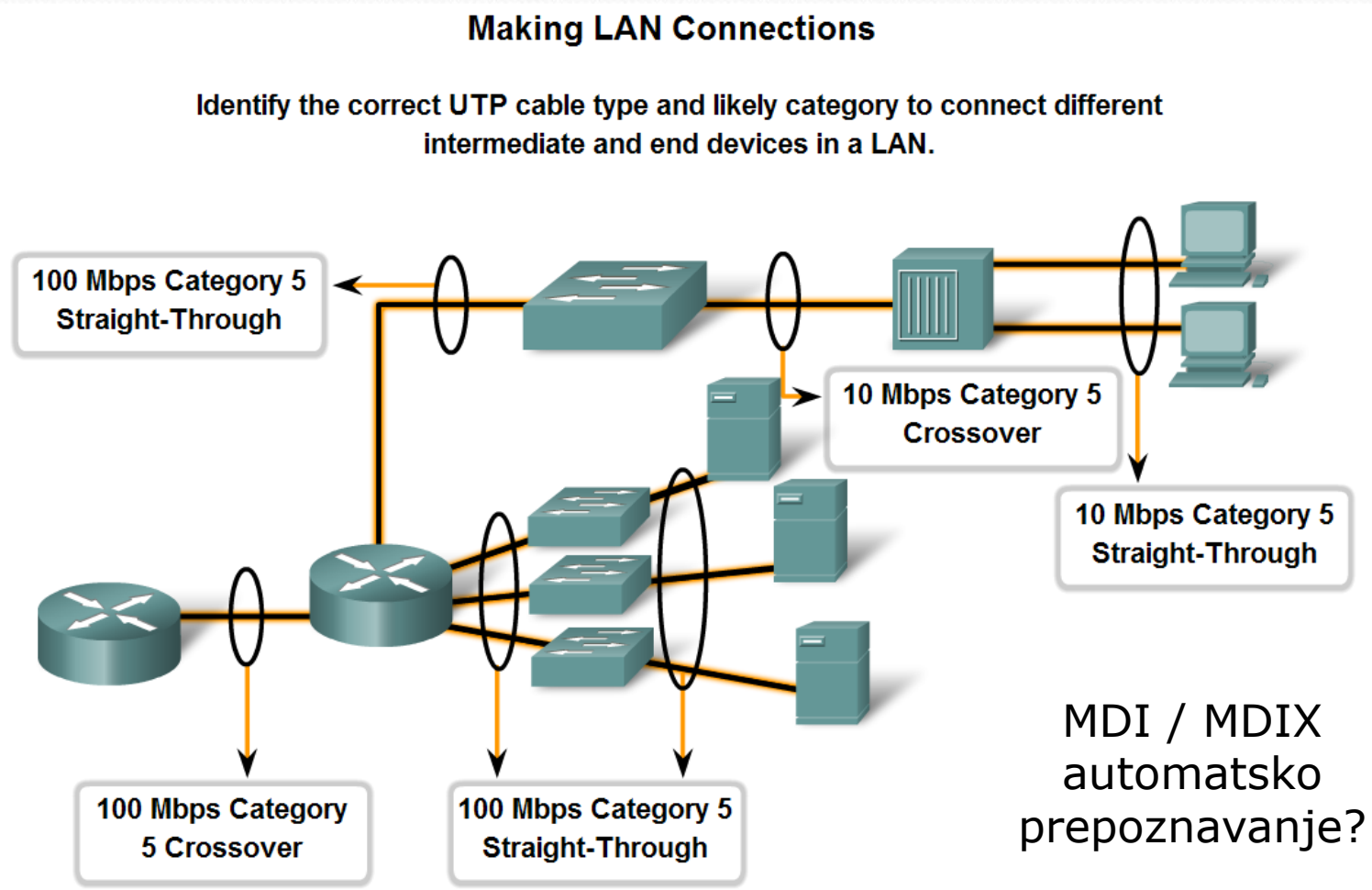
- UTP standardi dozvoljavaju maksimalnu dužinu od 100m (5+5+90) kad se saberu oblasti 1, 2 i 4 (bez vertikalnog kabliranja)
- Standardi vertikalnog kabliranja dozvoljavaju maksimalnu dužinu od 90m (UTP) do 3000m (optika)



Tipovi medijuma

- UTP (Cat5, 5e, 6, 7), optika, *wireless*
- Svaki medijum ima svoje prednosti i nedostatke
- Faktori pri izboru odgovarajućeg medijuma:
  - dužina kabla (*attenuation*)
  - cijena
  - *bandwidth*
  - lakoća instalacije (fleksibilnost)
  - EMI/RFI smetnje (*wireless*?)

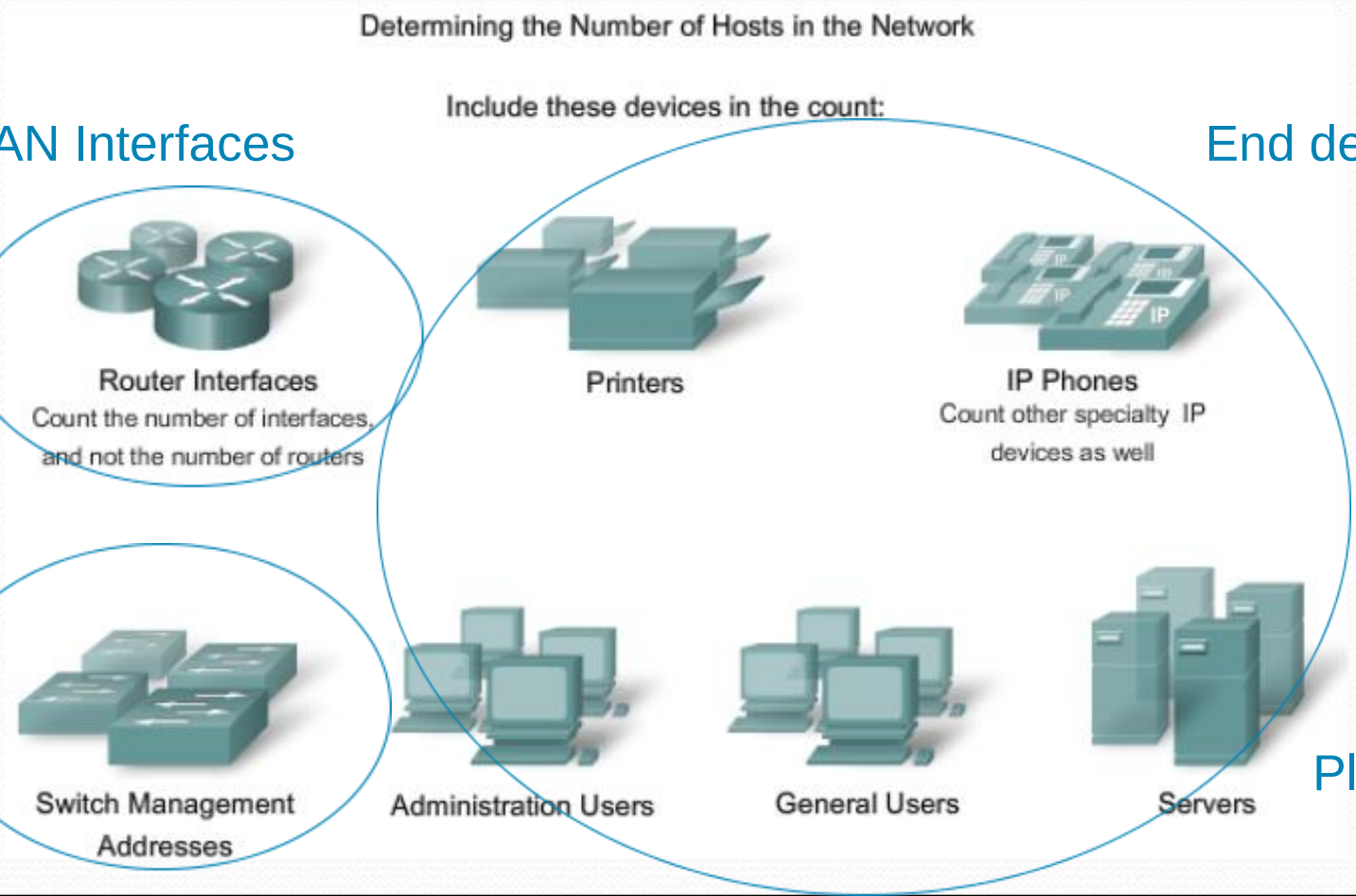
Kabliranje - primjer



MDI / MDIX automatsko prepoznavanje?

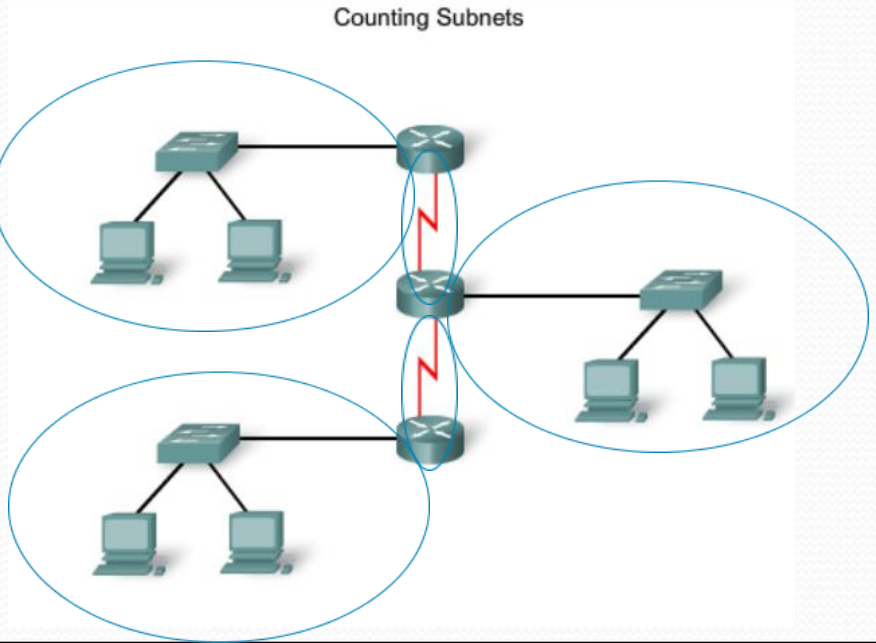
Koliko hostova ima u mreži?

- odrediti broj (danas i kasnije), jedna mreža ili više podmreža?

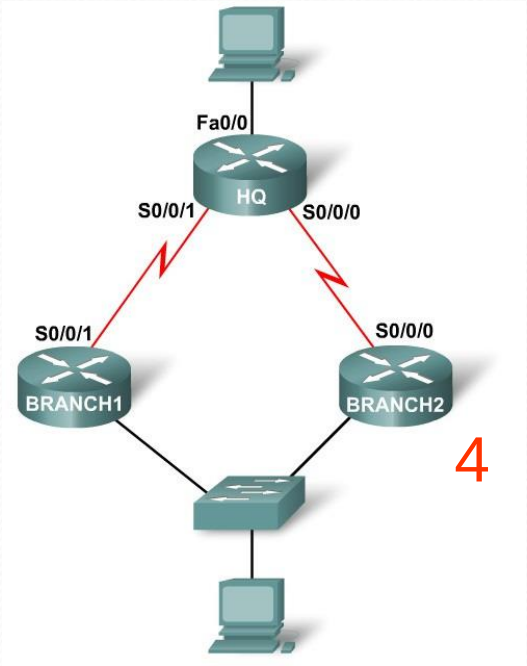


Koliko podmreža?

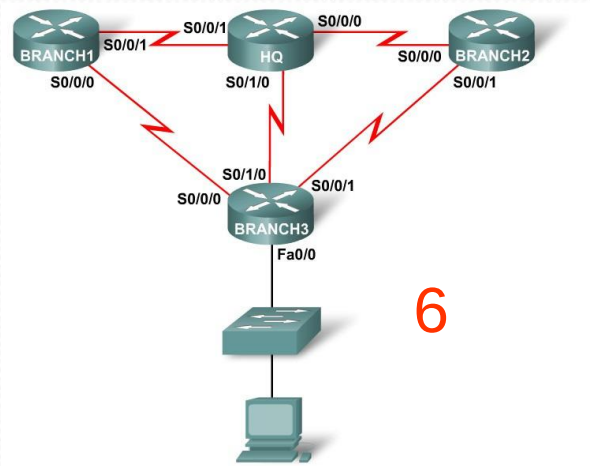
- Prednosti podjela u podmreže: razbijanje *broadcast* domena, različiti mrežni zahtjevi različitih uređaja, sigurnost
- Svaka podmreža zahtijeva interfejs *router*-a kao *gateway*, a i svaka veza između dva *router*-a je podmreža!
- Ako se posudi n bita i ostane m host bita, broj podmreža postaje 2^n, a broj hostova po podmreži 2^m – 2



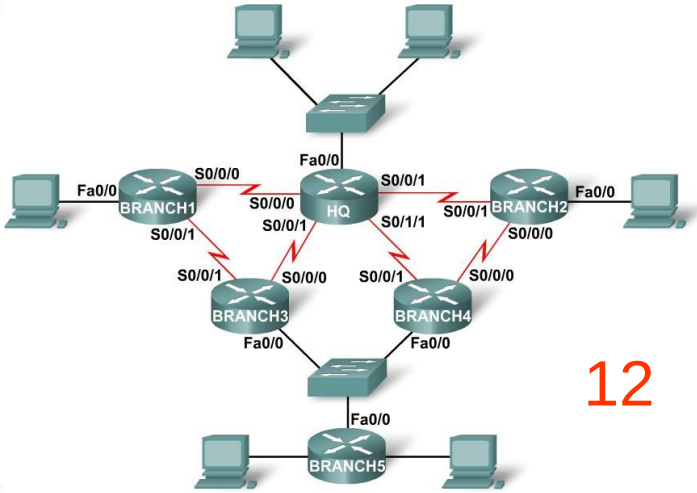
Koliko podmreža? (2)



4



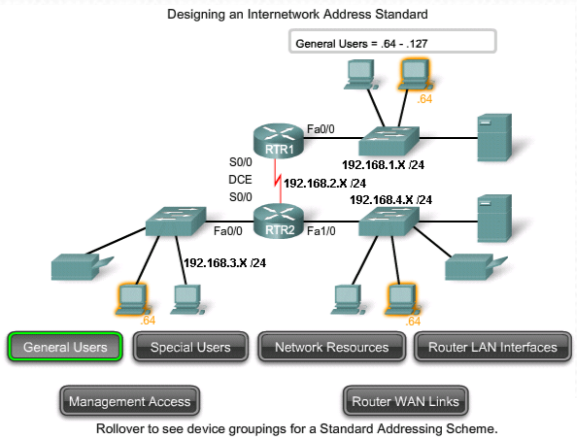
6

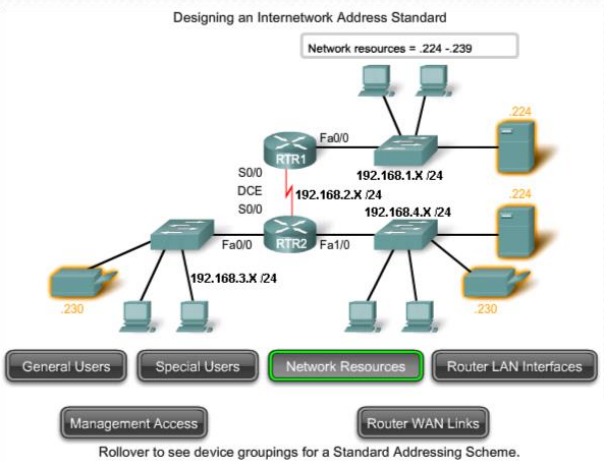


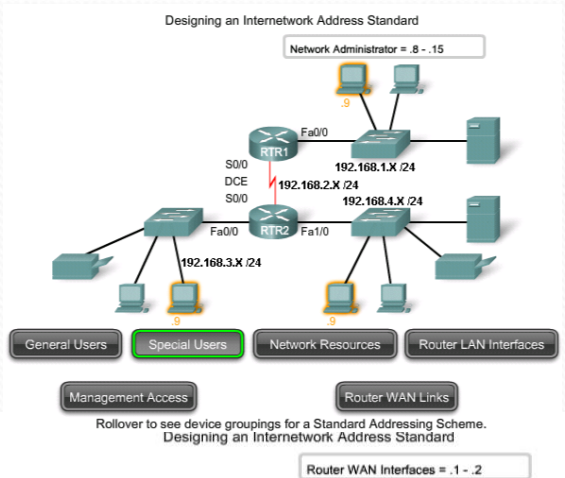
12

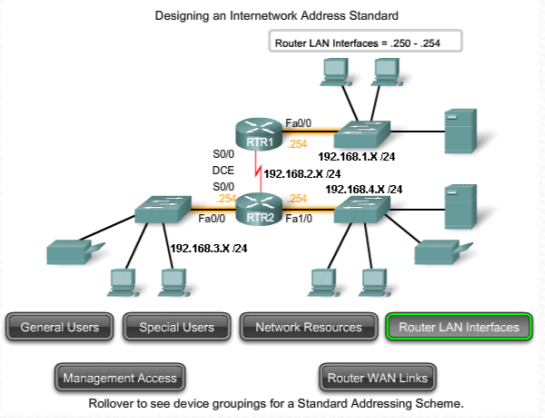
Dizajniranje standarda za našu mrežu

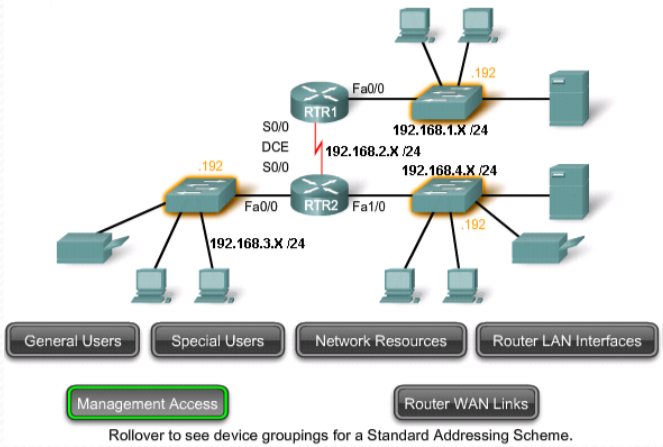
- konzistentnost, dokumentacija

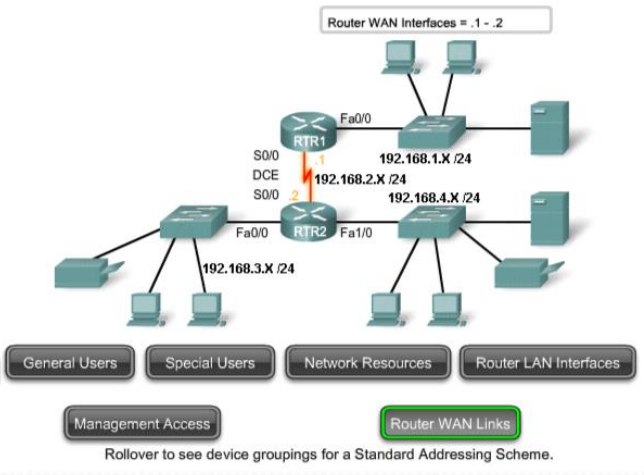




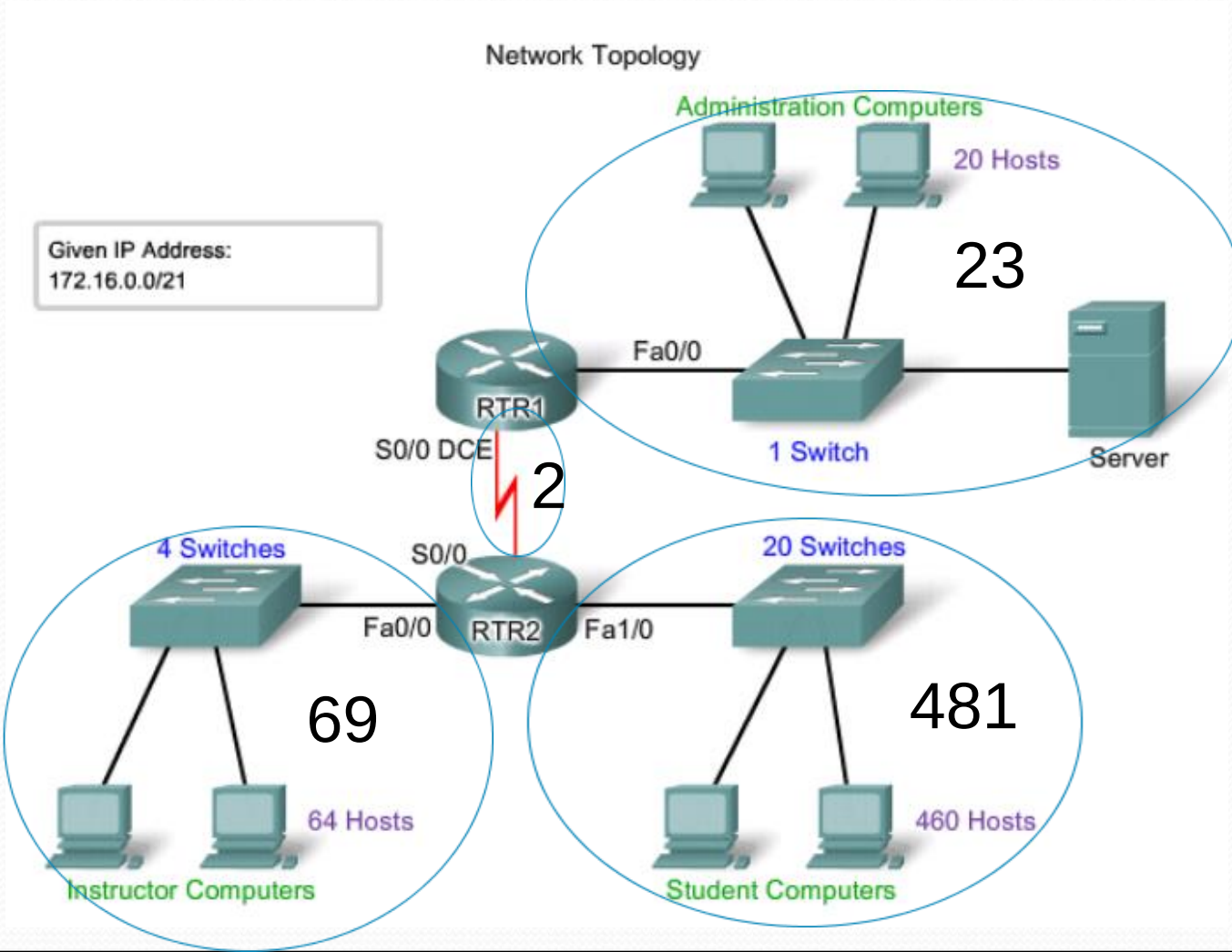








Adresiranje – primjer 1 (1)



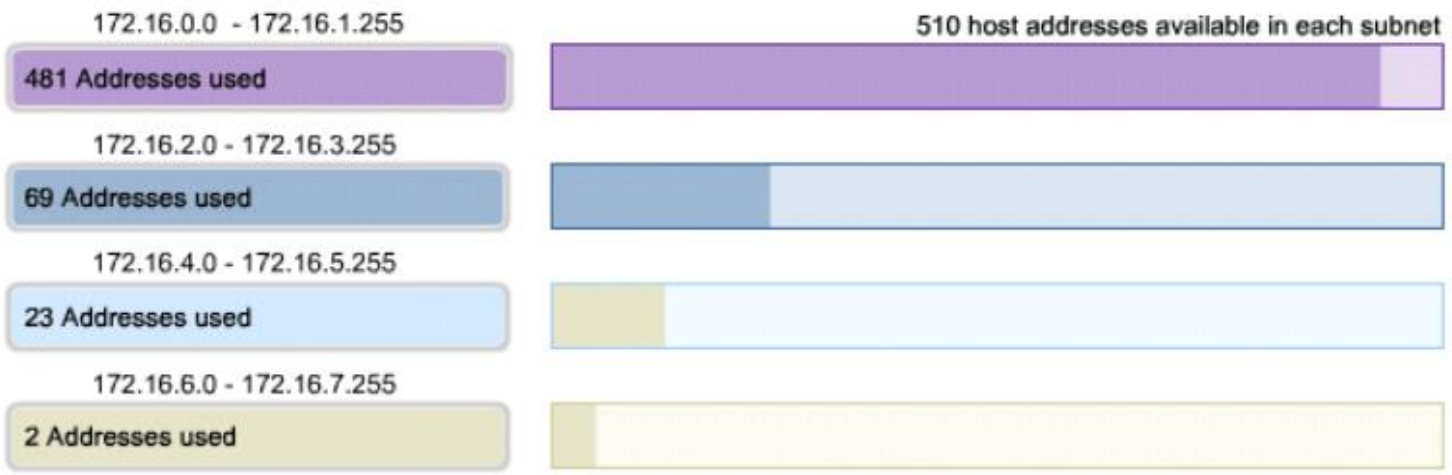
Adresiranje – primjer 1 (2)

- bez VLSM-a

Calculating Addresses without VLSM Address Ranges for Subnets

Case 1

Network	Subnet Address	Host Address Range		Broadcast Address
Student	172.16.0.0/23	172.16.0.1	172.16.1.254	172.16.1.255
Instructor	172.16.2.0/23	172.16.2.1	172.16.3.254	172.16.3.255
Administration	172.16.4.0/23	172.16.4.1	172.16.5.254	172.16.5.255
WAN	172.16.6.0/23	172.16.6.1	172.16.7.254	172.16.7.255



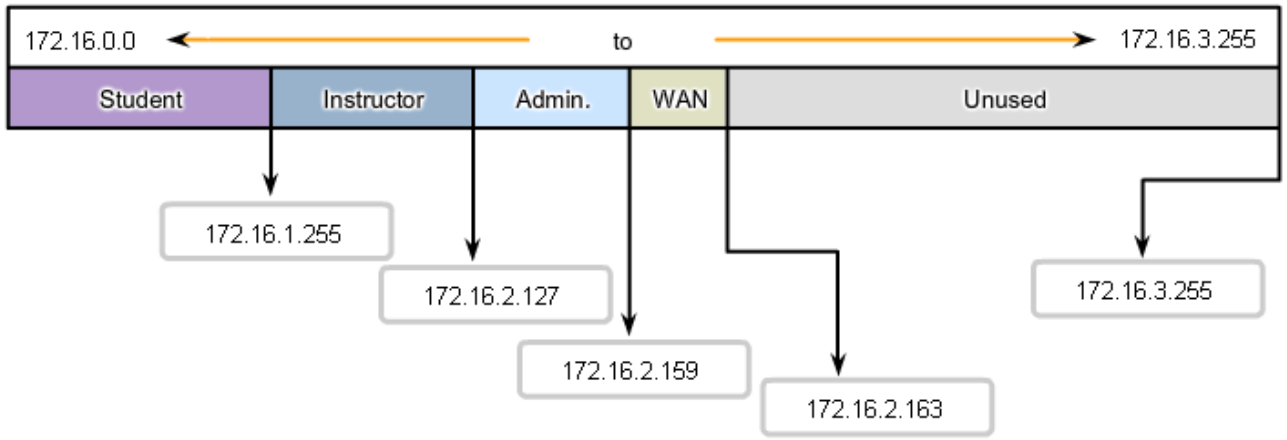
Adresiranje – primjer 1 (3)

- VLSM

Calculating Addresses with VLSM Address Ranges for Subnets

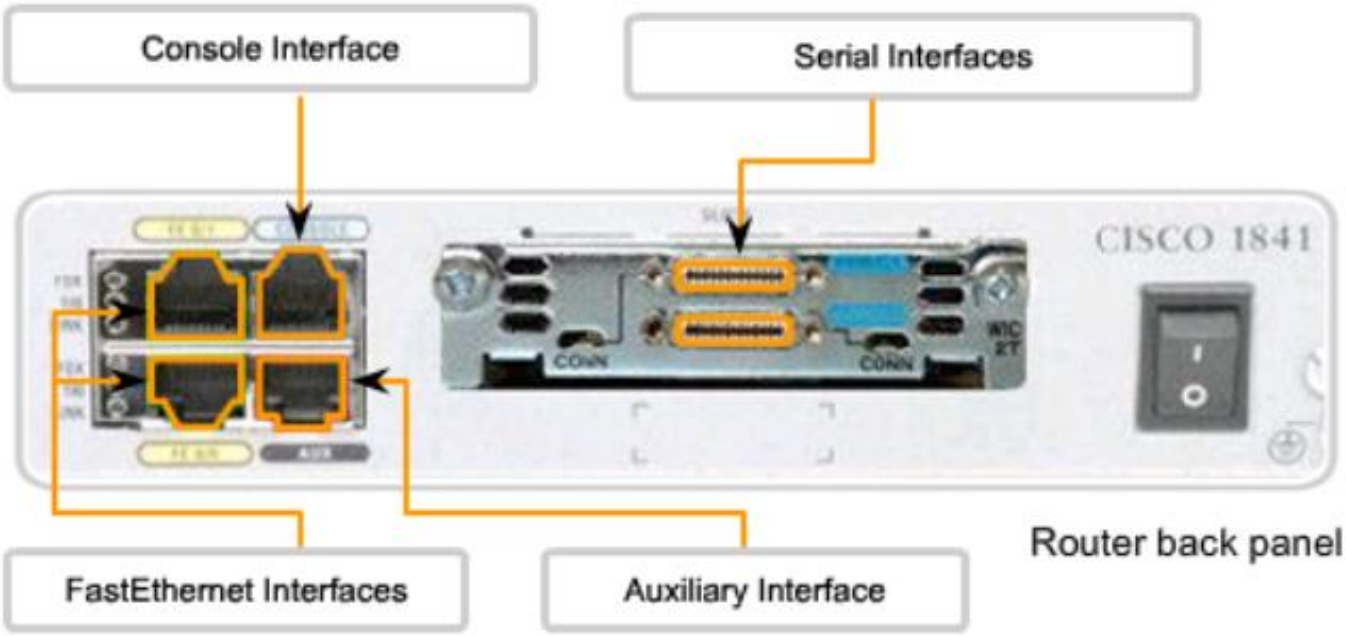
Case 1

Network	Subnet Address	Host Address Range		Broadcast Address
Student	172.16.0.0/23	172.16.0.1	172.16.1.254	172.16.1.255
Instructor	172.16.2.0/25	172.16.2.1	172.16.2.126	172.16.2.127
Administration	172.16.2.128/27	172.16.2.129	172.16.2.158	172.16.2.159
WAN	172.16.2.160/30	172.16.2.161	172.16.2.162	172.16.2.163
Unused	na	172.16.2.164	172.16.2.254	na



Interfejsi uređaja

- LAN interfejs
- WAN interfejs
- konzolni interfejs – konfigurisanje uređaja
- AUX interfejs – *remote* konfigurisanje pre modema



Povezivanje na uređaj

- Mrežni uređaji tipično nemaju monitor, tastaturu i miš
- Povezivanje na njih preko računara i programa terminal emulator
- Koraci:

- RJ-45 kraj kabla spojiti na konzolni port routera, a DB-9 kraj u serijski port računara
- Pokrenuti *HyperTerminal*
- Kliknuti *Enter*