

LV5- IPv6 adresiranje

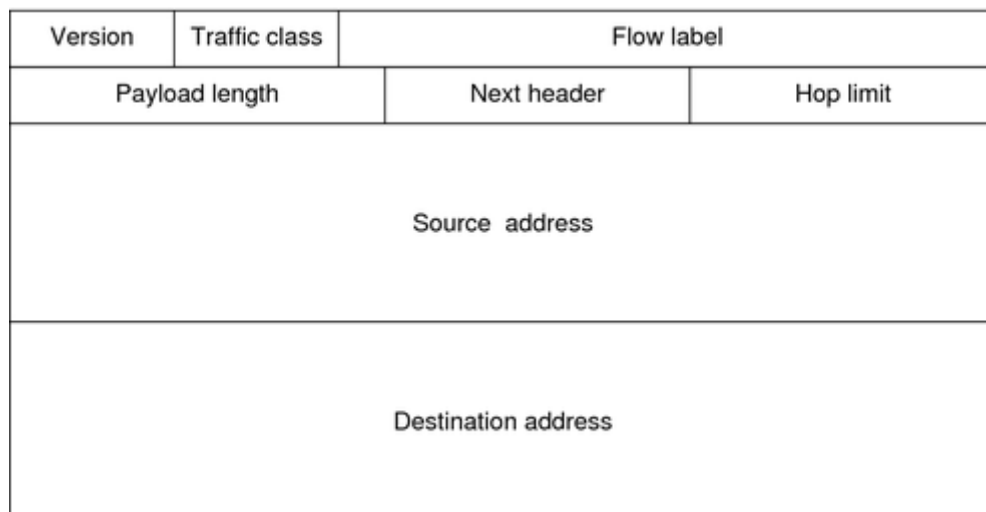
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PRIPREMA

1. Na primjeru objasni format IPv6 adrese



2. Skiciraj IPv6 zaglavlje i objasni funkcije pojedinih polja.



Verzija: polje dužine 4 bita (6 označava verziju IPv6)

Klasa prometa (engl. Traffic class):

-4 bita

-omogućava postavljanje željenog prioriteta pri uručivanju paketa

16 mogućih vrsta (0-7 nije bitno kašnjenje, 8-15 u realnom vremenu)

Oznaka toka (engl. Flow label):

-24 bita

-S ishodišnom adresom čini jedinstveni broj koji označava pakete za

-posebno rukovanje kod usmjernika (npr. za VoIP)

Dužina podatka (engl. Payload length): duljina korisnog sadržaja

Sljedeće zaglavlje (engl. Next header):

-Označava koji tip zaglavlja slijedi odmah iza IPv6 zaglavlja (npr. TCP)

Ograničenje broja skokova (Hop limit):

-polje koje definira koliko usmjernika paket može proći prije nego bude uništen

-Broj od 8 okteta

-Slično kao TTL polje

Ishodišna adresa:

-128 bitna adresa ishodišta paketa

Odredišna adresa:

-128 bitna adresa odredišta paketa

Zaglavlje proširenja:

-Opcionalna polja koja slijede obvezno zaglavlje

-Osnovno zaglavlje uvijek je iste duljine

3. Ukratko objasni novosti koje donosi IPv6.

Puno veći adresni prostor, novi format zaglavlja, ugrađeni sustavi zaštite podataka, poboljšana podrška za kvalitetu usluge, proširivost.

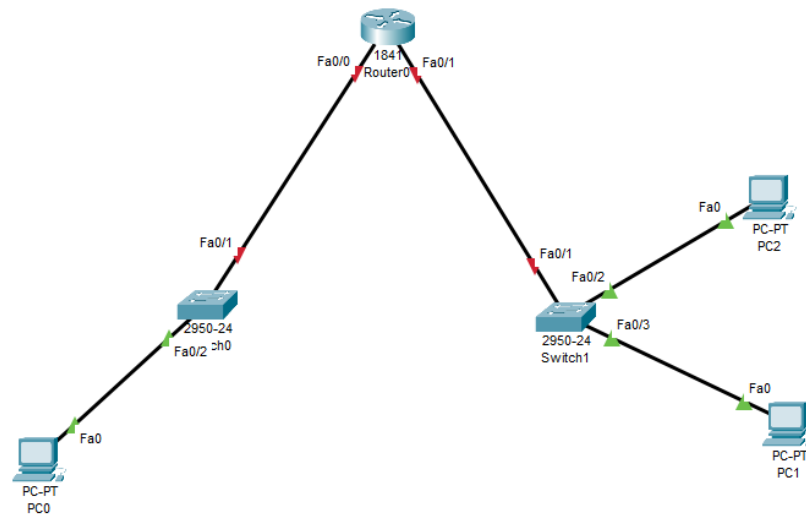
4. Objasni tipove jednodređišnih IPv6 adresa.

1. Adresa na lokalnoj vezi → koriste se pri autokonfiguraciji mreže kako bi uređaji imali neku adresu za komunikaciju s usmjernikom. Prefiks FE80::/10

2. Adresa lokalne mreže → ista uloga kao i privatne adrese u IPv4. Adresiranje uređaja koji nisu spojeni na internet → domet unutar lokalne mreže.

VJEŽBA

1.



```
C:\>ping FE80::204:9AFF:FEE3:31B1

Pinging FE80::204:9AFF:FEE3:31B1 with 32 bytes of data:

Reply from FE80::204:9AFF:FEE3:31B1: bytes=32 time<lms TTL=128
Reply from FE80::204:9AFF:FEE3:31B1: bytes=32 time<lms TTL=128
Reply from FE80::204:9AFF:FEE3:31B1: bytes=32 time<lms TTL=128
Reply from FE80::204:9AFF:FEE3:31B1: bytes=32 time<lms TTL=128

Ping statistics for FE80::204:9AFF:FEE3:31B1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

2.

```
Router>enable
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#ipv6 unicast-routing
Router(config)#int fastethernet 0/1
Router(config-if)#ipv4 address FE80::1 link-local
^
% Invalid input detected at '^' marker.

Router(config-if)#ipv6 address FE80::1 link-local
Router(config-if)#no shut

Router(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up
```

Desi se isto kao i sa 0/0

```
C:\>ping FE80::204:9AFF:FEE3:31B1

Pinging FE80::204:9AFF:FEE3:31B1 with 32 bytes of data:

Reply from FE80::204:9AFF:FEE3:31B1: bytes=32 time<1ms TTL=128
Reply from FE80::204:9AFF:FEE3:31B1: bytes=32 time<1ms TTL=128
Reply from FE80::204:9AFF:FEE3:31B1: bytes=32 time<1ms TTL=128
Reply from FE80::204:9AFF:FEE3:31B1: bytes=32 time<1ms TTL=128

Ping statistics for FE80::204:9AFF:FEE3:31B1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

3.

```
Cisco Packet Tracer PC Command Line 1.0
C:\>ping FE80::2E0:B0FF:FEB8:EC24

Pinging FE80::2E0:B0FF:FEB8:EC24 with 32 bytes of data:

Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for FE80::2E0:B0FF:FEB8:EC24:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

C:\>ping FE80::204:9AFF:FEE3:31B1

Pinging FE80::204:9AFF:FEE3:31B1 with 32 bytes of data:

Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for FE80::204:9AFF:FEE3:31B1:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

Konfigurirana je adresa FE80::204:9AFF:FE0C:ED2na lokalnoj vezi PC0, ali pinganjem paketi ne dolaze do PC1 i PC2. Rezultat je takav zbog toga što mreže nisu povezane.

4.

Adrese u skracenom obliku

2001:DB8:AAAA:A::1/64

2001:DB8:AAAA:B::1/64

```
\router>enable
\router#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
\router(config)#ipv6 unicast-routing
\router(config)#int fastethernet 0/0
^
! Invalid input detected at '^' marker.

\router(config)#int fastethernet 0/0
\router(config-if)#ipv6 address 2001:0DB8:AAAA:000A::1/64
\router(config-if)#no shut
\router(config-if)#exit
\router(config)#ipv6 unicast-routing
\router(config)#int fastethernet 0/1
\router(config-if)#ipv6 address 2001:0DB8:AAAA:000B::1/64
\router(config-if)#no shut
\router(config-if)#
```

5.

- a. mrežni dio adrese je prefiks lokalnog mrežnog segmenta
- b. host dio adrese je jednak host dijelu adrese na lokalnoj vezi
- c. IPv6 Gateway je FE80::1 za sva računala

```
C:\>ping 2001:DB8:AAAA:A::1
Pinging 2001:DB8:AAAA:A::1 with 32 bytes of data:
Reply from 2001:DB8:AAAA:A::1: bytes=32 time<lms TTL=127
Reply from 2001:DB8:AAAA:A::1: bytes=32 time<lms TTL=127
Reply from 2001:DB8:AAAA:A::1: bytes=32 time<lms TTL=127
Reply from 2001:DB8:AAAA:A::1: bytes=32 time<lms TTL=127
Ping statistics for 2001:DB8:AAAA:A::1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```