



Nastavni predmet	RAČUNALNE MREŽE_3H
Naslov cjeline	Djelovanje u mrežnom sloju
Naslov jedinice	Vježba 3: IPv6 adresiranje

PRIPREMA ZA VJEŽBU

1. Na primjeru objasni format IPv6 adrese.
128 bitova koji služe za adresiranje – 64 za mrežu i 64 za hosta.
2. Skiciraj IPv6 zaglavlje i objasni funkcije pojedinih polja.
3. Ukratko objasni novosti koje donosi IPv6.
Povećani broj bitova adrese, veća veličina adresnog prostora, ugrađeni novi sigurnosni mehanizmi, novi način adresiranja, novi izgled zaglavlja itd.
4. Objasni tipove jednodredišnih IPv6 adresa.
 - a Globalne jednodredišne adrese – na globalnoj razini
 - b Jednodredišne lokalne adrese – rezervirane za lokalne mreže
 - c Jedinstvene lokalne jednodredišne adrese – rezervirane za posebnu uporabu
 - d Posebne adrese – nespecificirane ili adrese povratne petlje

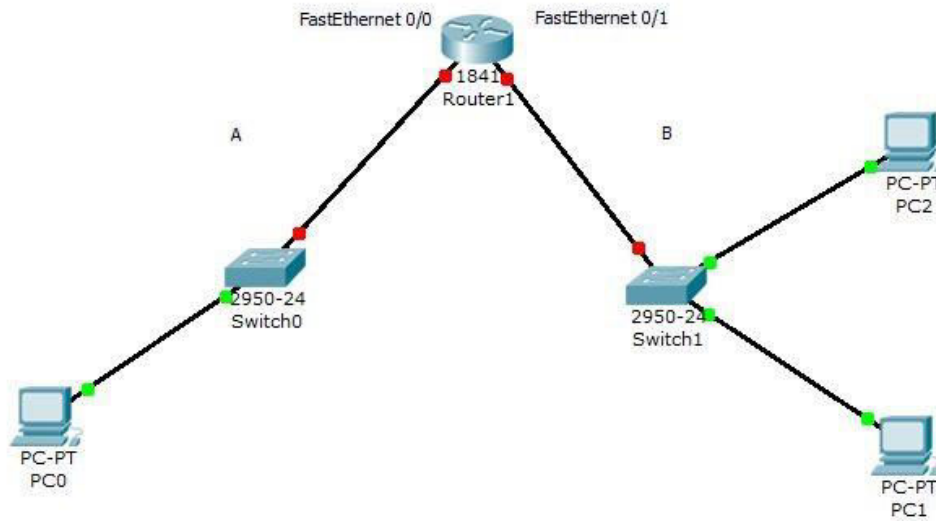
IZVOĐENJE VJEŽBE

Ciljevi vježbe:

1. Naučiti osnovne tipove IPv6 adresa koje se koriste u lokalnim mrežama povezanim na Internet.
2. Savladati osnovnu konfiguraciju usmjernika za rad sa IPv6 adresama te konfiguraciju globalnih i lokalnih adresa sučelja.
3. Naučiti statički konfigurirati IPv6 adrese računala u simulatoru.

Zadaci:

1. Formiraj mrežu prema prikazanoj topologiji.



Provjeri da li računala PC1 i PC2 imaju automatski konfigurirane adrese na lokalnoj vezi (engl. link-local address). Pinging adrese na lokalnoj vezi, provjeri vezu između PC1 i PC2.

```

Cisco Packet Tracer PC Command Line 1.0
C:\>ping FE80::2E0:F7FF:FE9B:AC16

Pinging FE80::2E0:F7FF:FE9B:AC16 with 32 bytes of data:

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

Ping statistics for FE80::2E0:F7FF:FE9B:AC16:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

C:\>ping FE80::2E0:F7FF:FE9B:AC16

Pinging FE80::2E0:F7FF:FE9B:AC16 with 32 bytes of data:

Reply from FE80::2E0:F7FF:FE9B:AC16: bytes=32 time<lms TTL=128
Reply from FE80::2E0:F7FF:FE9B:AC16: bytes=32 time<lms TTL=128
Reply from FE80::2E0:F7FF:FE9B:AC16: bytes=32 time<lms TTL=128
Reply from FE80::2E0:F7FF:FE9B:AC16: bytes=32 time<lms TTL=128

Ping statistics for FE80::2E0:F7FF:FE9B:AC16:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>

```

int



2. Usmjernik podrazumijevano nema omogućeno korištenje protokola IPv6 i potrebna je konfiguracija istog. Konfigurirajte adresu na lokalnoj vezi za sučelje FastEthernet 0/0 na sljedeći način:

```
--- System Configuration Dialog ---
Continue with configuration dialog? [yes/no]: no

Press RETURN to get started!

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

%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up
```

Na isti način, konfigurirajte i adresu za sučelje FastEthernet 0/1.
Koji je rezultat ovih akcija?

Pinganjem sa računala PC1 i PC2 provjerite dostupnost ovih sučelja.

```
Router(config-if)#
Router(config-if)#exit
Router(config)#interface FastEthernet0/0
Router(config-if)#exit
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console
router
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#ipv6 unicast-routing
Router(config)#fastethernet 0/0
^
% Invalid input detected at '^' marker.
Router(config)#int fastethernet 0/0
Router(config-if)#ipv6 address FE80::1 link-local
Router(config-if)#no shut

Router(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up

Router(config-if)#exit
Router(config)#ipv6 unicast-routing
Router(config)#int fastethernet 0/1
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
```

3. Provjerite da li je konfigurirana adresa na lokalnoj vezi računala PC0. Ukoliko jest, pinganjem provjerite dostupnost računala PC1 i PC2. Kakav je rezultat? Zašto?
Ne pingaju se, paketi su izgubljeni jer smo router konfigurirali na način da rade samo lokalne mreže bez među odnosa.
4. Kako bismo povezali obje mreže, potrebno je konfigurirati globalne adrese (engl. unicast global address). Za naše dvije mreže, koristit ćemo sljedeće adrese:

Mreža A: 2001:0DB8:AAAA:000A:0000:0000:0000:0000/64



Mreža B: 2001:0DB8:AAAA:000B:0000:0000:0000:0000/64

Kako bismo adrese ovih mreža napisali u skraćenom obliku?

Na već opisan način (u naredbi `#ipv6 address` izostavite `link-local`), konfigurirajte globalne adrese za sučelja FastEthernet 0/0 i FastEthernet 0/1, pridajući im prvu moguću adresu u pojedinoj mreži.

5. Računalima statički dodijelite IPv6 adrese:

- mrežni dio adrese je prefiks lokalnog mrežnog segmenta
- host dio adrese je jednak host dijelu adrese na lokalnoj vezi
- IPv6 Gateway je FE80::1 za sva računala Pinganjem provjerite

povezanost računala.

The screenshot shows the configuration window for PC1, specifically the 'Attributes' tab. The 'IP Configuration' section is active, showing settings for the 'FastEthernet0' interface. The 'Static' radio button is selected for both IPv4 and IPv6 configurations. The IPv6 Address field is set to '2001:DB8:AAAA:B::2' with a prefix length of '64'. The Link Local Address is 'FE80::2E0:F7FF:FE9B:AC16' and the Default Gateway is 'FE80::1'. The '802.1X' section is also visible, with 'Use 802.1X Security' unchecked and 'Authentication' set to 'MD5'.

Configuration Section	Option	Value
IP Configuration	Interface	FastEthernet0
	Configuration Type	Static
	IPv4 Address	
	Subnet Mask	
IPv6 Configuration	Configuration Type	Static
	IPv6 Address	2001:DB8:AAAA:B::2 / 64
	Link Local Address	FE80::2E0:F7FF:FE9B:AC16
	Default Gateway	FE80::1
802.1X	Use 802.1X Security	<input type="checkbox"/>
	Authentication	MD5
	Username	
	Password	



PC0

```
Physical  Config  Desktop  Programming  Attributes
Command Prompt

Pinging FE80::290:BAFF:FE4D:AA60 with 32 bytes of data:

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

Ping statistics for FE80::290:BAFF:FE4D:AA60:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

C:\>ping 2001:DB8:AAAA:B::2

Pinging 2001:DB8:AAAA:B::2 with 32 bytes of data:

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

Ping statistics for 2001:DB8:AAAA:B::2:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

C:\>ping 2001:DB8:AAAA:B::2

Pinging 2001:DB8:AAAA:B::2 with 32 bytes of data:

Reply from 2001:DB8:AAAA:B::2: bytes=32 time=10ms TTL=127
Reply from 2001:DB8:AAAA:B::2: bytes=32 time=8ms TTL=127
Reply from 2001:DB8:AAAA:B::2: bytes=32 time=1ms TTL=127
Reply from 2001:DB8:AAAA:B::2: bytes=32 time<1ms TTL=127

Ping statistics for 2001:DB8:AAAA:B::2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 10ms, Average = 4ms

C:\>
```

SVEN GRGIĆ – 3.B