

# Sustavi za praćenje i vođenje procesa

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Zavod za elektroničke sustave i obradbu signala

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## Internet

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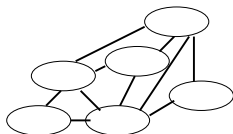
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## Što je Internet?

- nije
  - organizacija
  - infrastruktura
- mreža svih mreža
- zasnovana na Internet Protocol-u (IP)
- računala koja "razgovaraju" IP-om
- sinonim za globalnu mrežu
- virtualna mreža



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## Revolucionarna svojstva

- lokalan (LAN) i globalan (WAN)
- vrlo jednostavan
- otvoren, besplatan
- izravno komuniciranje, bez posrednika
- bez hijerarhije
- bez organizacije

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## Tko je vlasnik Interneta ?

- nema vlasnika
- nema "nadzornika"
- IAB - Internet Activities Board
- IETF - Internet Engineering Task Force
- IANA - Internet Assigned Numbers Authority
- InterNIC - Network Information Centre
- Internet Society

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## Posljedice

- 20+ godina star
- vrlo stabilan
- postoji za svako računalo i OS
- pregršt proizvoda
  - e-mail, telnet, ftp
  - talk, chat, irc
  - gopher, www, vrmf
  - IP-telephony, real-audio, real-video
- korisniku briše granice mreža

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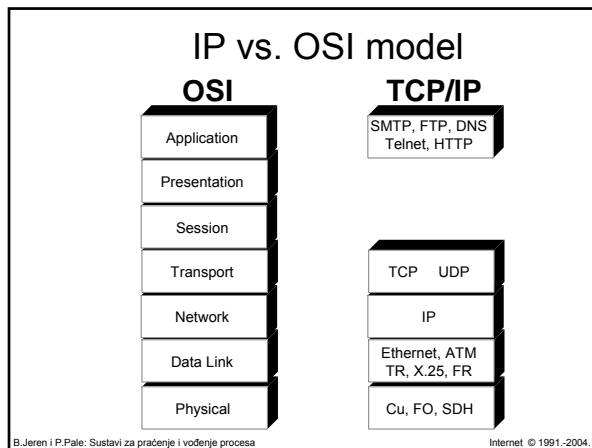
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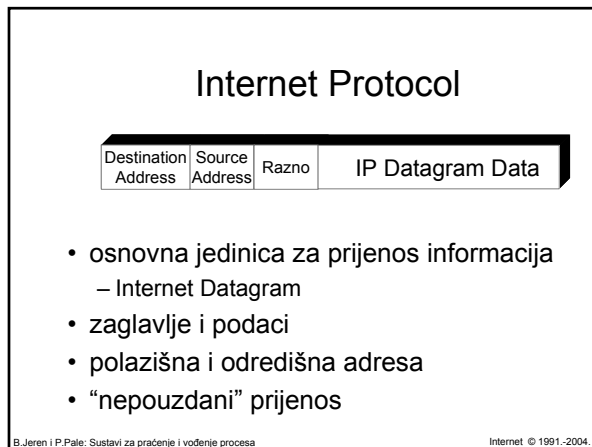
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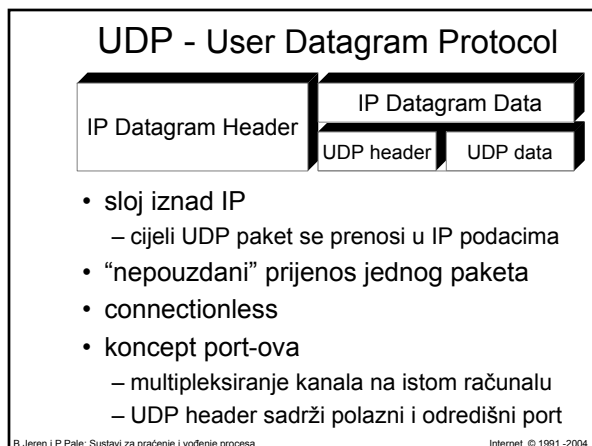
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## TCP - Transport Control Protocol

- sloj iznad IP
  - cijeli TCP paket se prenosi u IP podacima
- pouzdani prijenos toka podataka
- connection oriented
- koncept port-ova
  - multipleksiranje kanala na istom računalu
  - TCP header sadrži polazni i odredišni port

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## TCP sučelje

- tok podataka (stream)
- prividna privatna veza (virtual circuit connection)
  - uspostava veze
  - potvrda prijensa
  - provjera ispravnosti
- prijenos kroz spremnik (buffered transfer)
  - "paketiciranje niza podataka"
  - briga o redoslijedu
- tok bez strukture (unstructured stream)
- puna dvosmjerna veza (full duplex connection)

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## Viši protokoli

- koriste UDP i/ili TCP (sloj iznad)
- koriste portove
- SMTP
- SNMP
- TELNET, rlogin, ssh
- TFTP, FTP, rcp
- DNS
- ...

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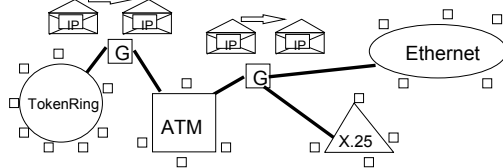
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## Prijenos IP datagrama mrežom



- enkapsulacijom u niže protokole
  - Ethernet, TokenRing, FDDI
  - PPP, SLIP
  - X.25, FR, ATM
- preko gateway-a (računalo)

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## Internet Adrese

	0	1	8	16	24	31
<b>A klasa</b>	0	net ID			host ID	
<b>B klasa</b>	1	0	net ID			host ID
<b>C klasa</b>	1	1	net ID			host ID

- svako računalo ima jedinstvenu adresu
- Internet adrese (mreža)
  - A klasa: od 0.0.0.0 do 127.255.255.255
  - B klasa: od 128.0.0.0 do 191.255.255.255
  - C klasa: od 192.0.0.0 do 255.255.255.255
- 0 i 255 su rezervirane za broadcast

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## Povezivanje Internet adrese i fizičke (MAC) adrese

- statičkom tablicom
  - čovjek unese parove:
    - Internet adresa - fizička adresa
- dinamički
  - ARP (Address Resolution Protocol)
  - nije dio Internet protokola već fizičkog sloja
  - za diskless računala RARP

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## Routing

- gateway prebacuje IP datagrame iz jedne mreže u drugu
- pri tome koristi tablicu: mreža - gateway
- gateway-i međusobno razmjenjuju podatke iz svojih tablica, koristeći
  - routing protokoli: RIP, OSPF, IGRP
- na svjetskoj su razini povezani glavni ruteri (core gateway)
  - routing protokoli: GGP, EGP, BGP, BGP4

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## DNS

- sve aplikacije koriste IP adrese
- ljudi koriste IP imena (domain names)
- DNS povezuje imena i adrese
  - distribuirani hijerarhijski sustav
  - povezuje u oba smjera (broj->ime i ime->broj)
- domene su odraz:ustrojstva Interneta, a ne fizičke povezanosti

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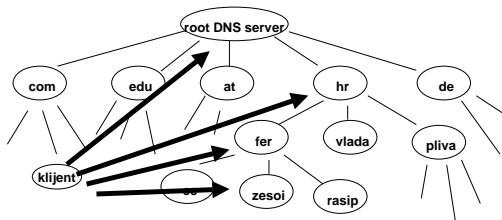
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## DNS arhitektura



- tražeći adresu za [www.zesoi.fer.hr](http://www.zesoi.fer.hr)

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## World Wide Web (http)

- HyperText Transfer Protocol
- URL (Universal Resource Locator)
  - protocol://host/pathname
  - <http://www.zesoi.fer.hr/nastava/predmeti/spvp>
- navigacijski alat (pogled na podatke) i korisničko sučelje
- nije organizacijski alat (baza podataka)

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## Nedostaci Interneta

- “ravna” adresna struktura
- premali adresni prostor
- ne podržava izokrone signale

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## Budućnost Interneta

- IPv6
  - privremeno rješava neke tehničke probleme
- “Internet” će uvijek postojati
- svi ljudi u Internet
- dominantne veze stroj-stroj
- potpuno izmijenjeno ljudsko društvo

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## Literatura

- Internetworking With TCP/IP
  - Douglas Comer
    - Prentice Hall, ISBN 0-13-470188-7
- Internet System Handbook
  - Daniel C. Lynch, Marshall T. Rose
    - Addison Wesley, ISBN 0-201-56741-5
- The Internet Connection
  - John S. Quarterman, Smoot Carl-Mitchell
    - Addison Wesley, ISBN 0-201-54237-4

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