Veri İletişimi ve Bilgisayar Ağları
BLM3051

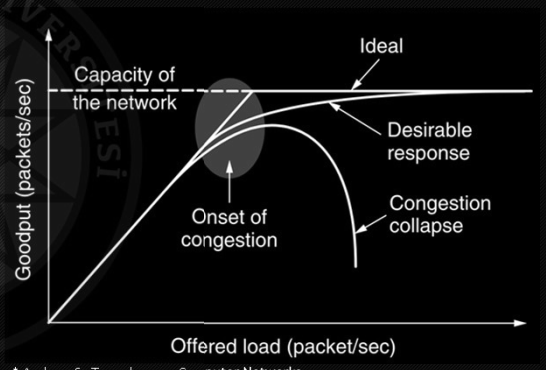
Dr. Öğr. Üyesi Furkan ÇAKMAK

Ders Bilgilendirme Formu – Haftalık Konular

Week #	Date	Subjects
1	20.02.2025	Veri İletişimine Giriş, Mimari Modeller
2	27.02.2025	OSI Referans Modeli, Katmanları, Fonksiyonları
3	06.03.2025	Fiziksel Katman, Sinyalleşme
4	13.03.2025	Paralel ve Seri İletişim, Haberleşme Ortamları ve Teknik Özellikleri, Multiplexing (TDM, FDM)
5	20.03.2025	Hata Tespiti ve Düzeltme Yöntemleri
6	27.03.2025	Veri Bağı Kontrol Teknikleri ve Akış Kontrolü
7	03.04.2025	Senkron ve Asenkron Veri Bağı Protokolleri (BSC, HDLC)
8	10.04.2025	Ara Sınav
9	17.04.2025	LAN Teknolojileri, IEEE 802.3, IEEE 802.4, 802.5, 802.11
10	24.04.2025	Geniş Alan Ağlarında Kullanılan Teknolojiler (X.25, ISDN, FR, ATM, xDSL.)
11	01.05.2025	Emek ve Dayanışma Günü
12	08.05.2025	Ağ Katmanı, Anahtarlama, Bağlantılı ve Bağlantısız Servisler, Statik ve Dinamik Routing
13	15.05.2025	Ağ Katmanında Sıkışıklık, Sebepleri ve Çözümleri, IP (Internetworking Protocol)
14	22.05.2025	ICMP, BOOTP, DHCP, Taşıma Katmanı - UDP (User Datagram Protocol), TCP (Transmisson Control Protocol)
15	29.05.2025	Öğrenci Proje Sunumları

Congestion in the Network Layer, Its Causes and Solutions

- The network and transport layers share the responsibility for handling congestion
  - Congestion occurs within the network
- Routers' buffers
- The low bant traffic
- Congestion control and flow control relationship
- Approaches to Congestion Control
  - The presence of congestion means that the load is greater than the resources can handle.
  - Increase the resources
  - Decrease the load.



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Congestion in the Network Layer, Its Causes and Solutions (Con't)

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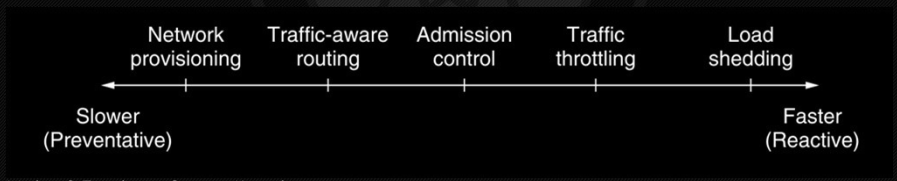
- Network Provisioning
- Traffic-Aware Routing
- Admission Control
- Traffic Throttling
  - **Choke Packet**
  - Explicit Congestion Notification
  - Hop-by-Hop Backpressure
- Load shedding



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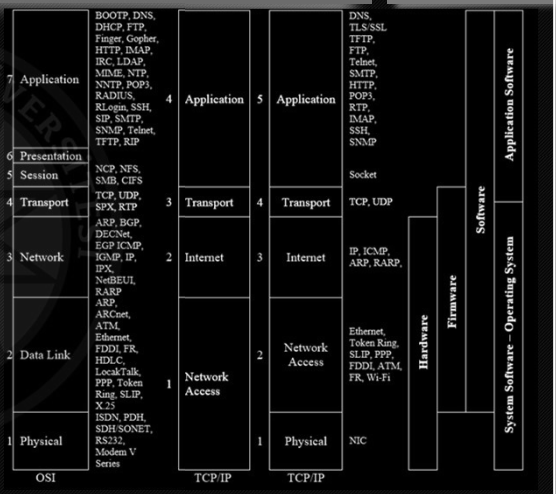
IP (Internetworking Protocol)

- TCP/IP: 4-5 katman
- Sockets
- Transport Layer
  - TCP (Transmission Control Protocol)
  - UDP (User Datagram Protocol)
- Package: Data with address info
- Datagram: Packet that complies with the structure defined by IP

Port	Protocol Name
20,21	FTP (File Transfer Protocol
23	Telnet
25	SMTP (Simple Mail Transfer Protocol)
80	HTTP (HiperText Transfer Protocol)
110	POP (Post Office Protocol)



IP (Internetworking Protocol) – Internet Layer

- Connectionless Protocol
  - No ACK
  - No error handling
  - Left to other layers
- So, IP is also described as an unreliable protocol.
- Basic Tasks of IP
  - Defining datagrams
  - Adding address info to datagrams
  - Transferring data between the transport layer and network access layers
  - Routing of datagrams
  - Fragmentation of datagrams and Re-assembling of them.
- Packets consist of **4 bytes addresses**.
  - Ex: 193.140.4.1

IP (Internetworking Protocol) – IPv4

- Host Addresses:
  - 11111111 -> Broadcast
  - 00000000 -> Network Address
  - 254 address left
- Subnet
  - Let's say a company has 35 terminals in Istanbul and 40 terminals in Ankara.
    - Total 75 terminals.
    - Is a class C address enough?
    - Is a class C address too much?
  - Class IP Subnet Mask:
    - 255.255.255.192
      - 2 x Network Address
      - 62 (2^6) x Host Address
  - Does the number of hosts decrease using subnet?
    - 252 (2 subnet x 126 address/subnet)
    - 248 (4 subnet x 62 address/subnet)
    - 240 (8 subnet x 30 address/subnet)

Address Class	Address Representation in Binary System	Address Range	Mask	Number of Networks	Number of Hosts
A Class	0xxxxxxx.xxxxxxxx.xxxxxxxx.xxxxxxxx	0.0.0.0-127.255.255.255	255.0.0.0	128	16.777.214
B Class	10xxxxxx.xxxxxxxx.xxxxxxxx.xxxxxxxx	128.0.0.0-191.255.255.255	255.255.0.0	16.384	65.534
C Class	110xxxxx.xxxxxxxx.xxxxxxxx.xxxxxxxx	192.0.0.0-223.255.255.255	255.255.255.0	2.097.152	254
D Class	1110xxxx.xxxxxxxx.xxxxxxxx.xxxxxxxx	224.0.0.0-239:255.255.255			Multicast
E Class	1111xxxx.xxxxxxxx.xxxxxxxx.xxxxxxxx	240.0.0.0-255.255.255.255			Reserved

IP (Internetworking Protocol) – Special IP Addresses and NAT(Network Address Translation)

- Special Purpose IP Address
  - 192.168.0.0/16
    - (255.255.0.0)
  - 10.0.0.0/8
  - 172.16.0.0/12
  - 172.31.0.0/12
  - 192.168.0.0/24
  - 192.168.255.0/24
  - 127.0.0.0
- **NAT (Network Address Translation)**

Thank you for listening…

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