



## IT og økonomi

Lektion: N: Netværk

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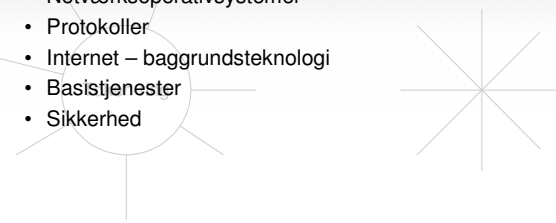
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### Lektionens emner

- Hvorfor netværk?
- Typer af netværk
- Fysisk opbygning
- Netværksoperativsystemer
- Protokoller
- Internet – baggrundsteknologi
- Basistjenester
- Sikkerhed




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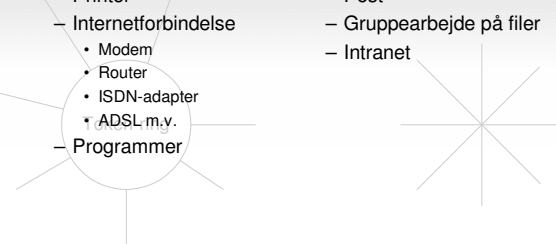
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### Hvorfor netværk?

<ul style="list-style-type: none"> <li>• Dele ressourcer           <ul style="list-style-type: none"> <li>– Harddisk (netdrev)</li> <li>– Printer</li> <li>– Internetforbindelse               <ul style="list-style-type: none"> <li>• Modem</li> <li>• Router</li> <li>• ISDN-adapter</li> <li>• ADSL m.v.</li> </ul> </li> <li>– Programmer</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Groupware           <ul style="list-style-type: none"> <li>– Kalender</li> <li>– Post</li> <li>– Gruppearbejde på filer</li> <li>– Intranet</li> </ul> </li> </ul>
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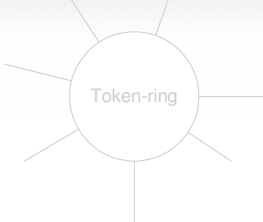

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### Typer af netværk

- LAN – Local Area Network
- WAN – Wide Area Network
- SAN – Storage Area Network

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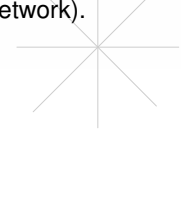
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### LAN – Local Area Network

- **LAN** - (*Local Area Network*). På dansk - "lokalt netværk". Et LAN vil typisk være et mindre netværk i en virksomhed. Som regel indenfor samme bygning, eller bygninger på samme grund. Internet er ikke et LAN - det er derimod et **WAN** (Wide Area Network).

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### WAN – Wide Area Network

- **WAN** - (*Wide Area Network*). Et større netværk, som dækker et større geografisk område. Internet er et WAN.

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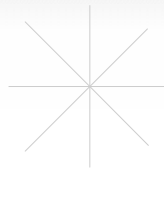
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### SAN – Storage Area Network

- SAN – (**Storage Area Network**). En løsning hvor alle på netværket kan gemme filer til fælles brug. Kan i dag ligge på Internettet, så der er adgang fra hele verden.

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### OSI-modellen

**THE 7 LAYERS OF OSI**




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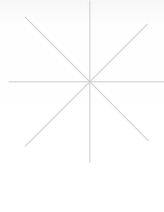
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### Fysisk opbygning

- Poin to point
- Shared communication line
  - Bus
  - Ring
  - Star

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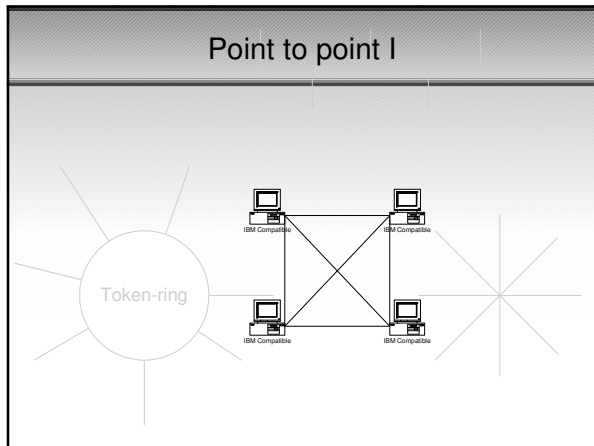
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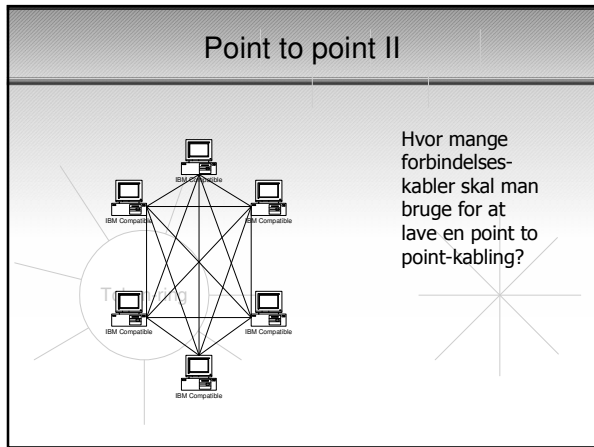
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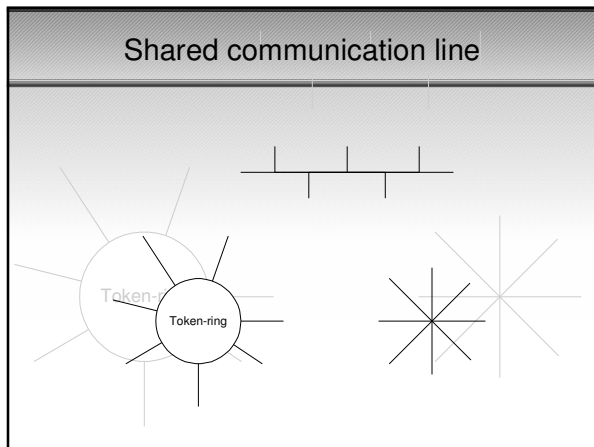
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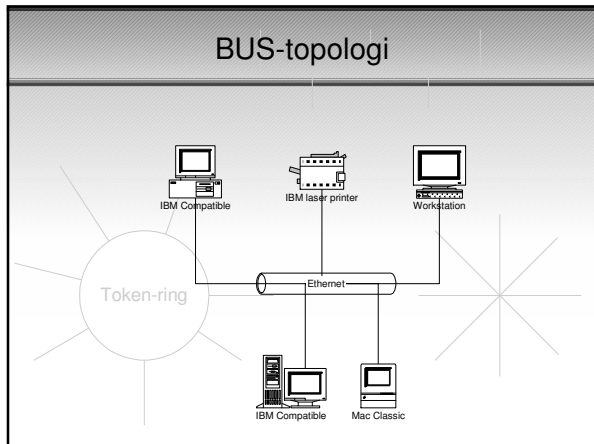
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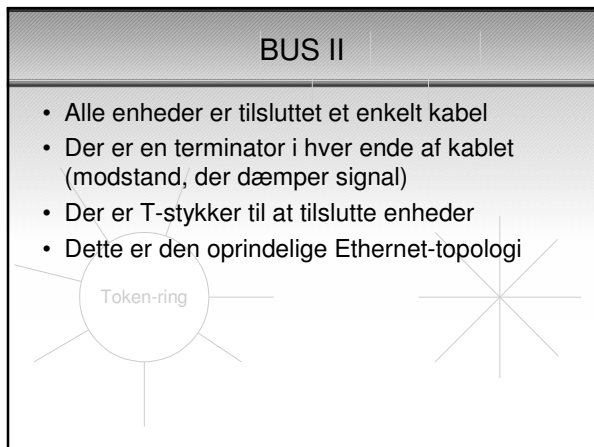
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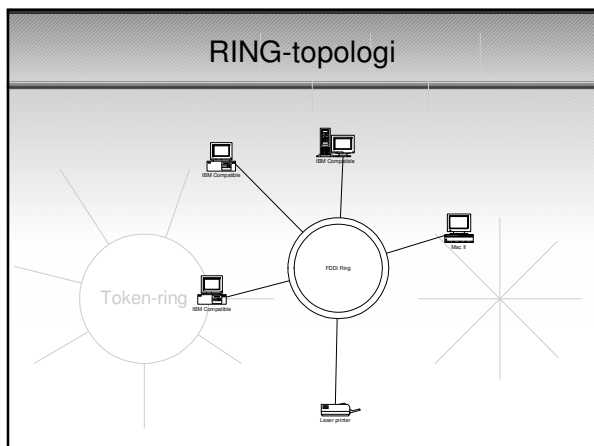
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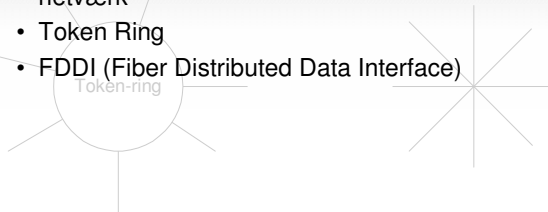
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### RING II

- Dataene transporteres rundt i ringen, så alle enheder har adgang til dem
- Den sekundære ring er kun med i back-bone-netværk
- Token Ring
- FDDI (Fiber Distributed Data Interface)




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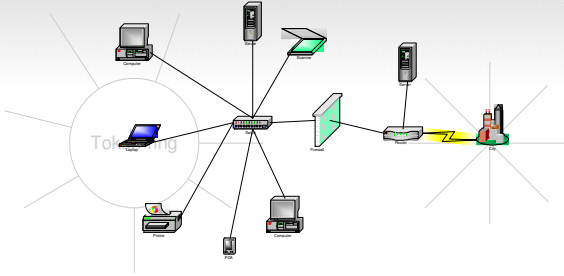
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### STAR-topologi




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### STAR II

- En central hub (/switch)
- Hver enhed har sin egen linie
- Nutidens Ethernet




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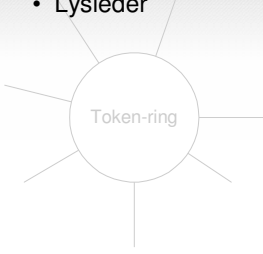
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### Kabeltyper

- Coax – runde stik og t-stykker
- UTP – Unshielded Twisted Pair
- Lysleder



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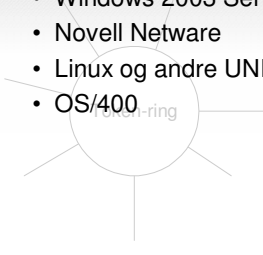
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### Netværksoperativsystemer

- Windows NT Server
- Windows 2000 Server
- Windows 2003 Server
- Novell Netware
- Linux og andre UNIX-kloner
- OS/400



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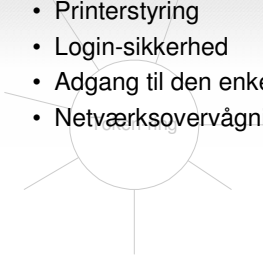
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### Netværksoperativsystemer II

- Samtidig adgang til filer
- Backup-faciliteter
- Printerstyring
- Login-sikkerhed
- Adgang til den enkelte fil/mappe
- Netværksovervågning



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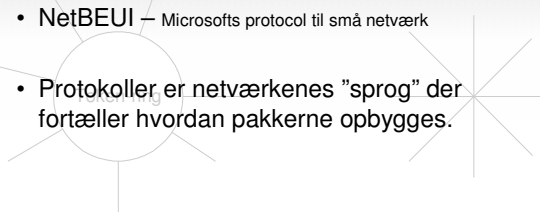
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### Protokoller

- IPX – Internetworking Packet Exchange
- TCP/IP – Transmission Control Protocol/IP
- IP – Internet Protocol
- NetBEUI – Microsofts protocol til små netværk

• Protokoller er netværkenes "sprog" der fortæller hvordan pakkerne opbygges.



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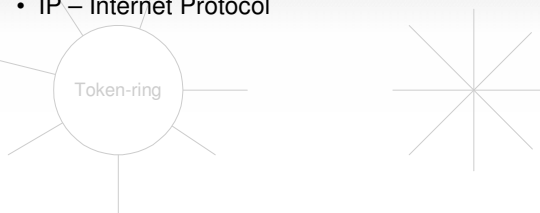
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### Internet

- Internetworking (mellem netværk)
- Sammenbinding af et stort antal heterogene netværk
- IP – Internet Protocol

Token-ring



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### Internet II

- WWW
- Mail
- News
- Chat
- FTP

Token-ring



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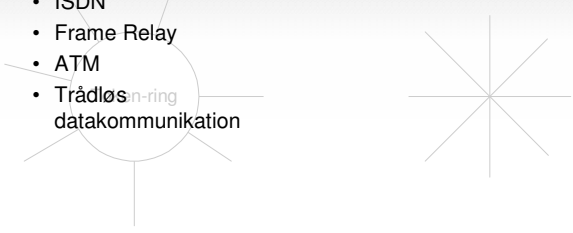
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### Basistjenester

- Faste linier
- Opkaldt forbindelse
- DATEX
- ISDN
- Frame Relay
- ATM
- Trådløs datakommunikation
- ADSL
- SDSL




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### Faste linier

- Fordele ved:
  - Meget stor trafikmængde
  - Kontinuerlig strøm af data
  - Transmission over korte afstande
  - Kommunikation med ét datacenter
- Ulemper:
  - Pris




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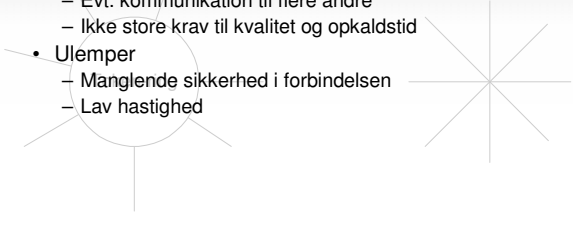
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### Opkaldt forbindelse

- Modem – Modulering – Demodulering
- Fordele ved:
  - Lille trafikmængde
  - Få opkald
  - Evt. kommunikation til flere andre
  - Ikke store krav til kvalitet og opkaldstid
- Ulemper
  - Manglende sikkerhed i forbindelsen
  - Lav hastighed




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### DATEX

- Fordele ved:
  - Store krav til sikkerhed
  - Middelstor trafikmængde
  - Relativt store afstande
  - Store krav til transmissionskvalitet
  - Kommunikation med flere geografisk adskilte enheder
  - Kort opkaldstid
- Ulemper:
  - Pris


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### ISDN

- Integrated Services Digital Network
- Digital telefonlinie på gamle kabler
- Altid oprettelse af min. 2 kanaler
- Kanaler kan bundles til 2\*64 Kbit/sek
- Fordele:
  - Kort opkaldstid
  - God kvalitet
- Ulemper:
  - Dyr i drift


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### Frame Relay

- Opkald til fx TeleDanmark
  - De klarer resten af vejen, når du er kommet ind på centralen.
- Meget fleksibel løsning
- Billig i forhold til faste linier
- Driftssikker løsning


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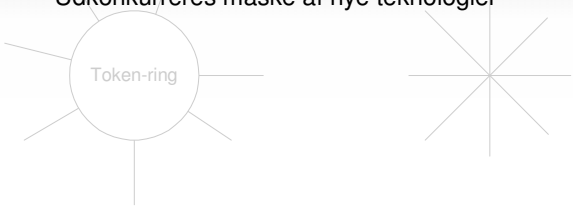
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**ATM**

- Asynchronous Transfer Mode
- Var i slutningen af 90'erne fremtidens net
- Bruges på back-bone-net
- Udkonkurreres måske af nye teknologier




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**Trådløs datakommunikation**

- Radiokæde
  - Op til 80 km
  - Op til 155 Mbit/sek
  - Ofte 2\*4 Mbit/sek
- RadioLAN
  - Op til 5 km
  - Op til 4 Mbit/sek




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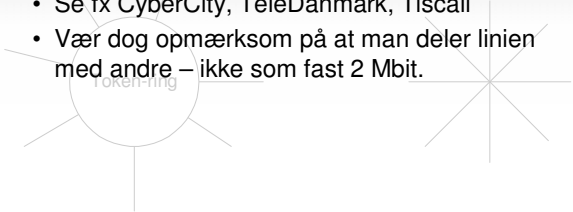
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**ADSL**

- Asymmetrical Digital Subscriber Line
- Op til 2 Mbit/sek
- Ekstreme prisfald i øjeblikket
- Se fx CyberCity, TeleDanmark, Tiscali
- Vær dog opmærksom på at man deler linien med andre – ikke som fast 2 Mbit.




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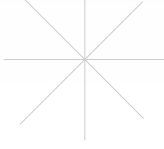
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### SDSL

- Symmetrical Digital Subscriber Line
- Som ADSL, men lige stor hastighed til rådighed begge veje
- Bedste løsning for mange virksomheder i øjeblikket – router inkl. firewall
- Lidt dyrere end ADSL
- Mest som erhvervspakker



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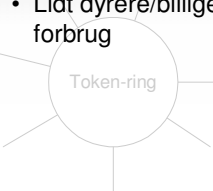

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### Kabelmodem

- Fællesantenneløsninger
- Som ADSL
- Bedste løsning for mange private i øjeblikket
- Lidt dyrere/billigere end ADSL alt efter forbrug



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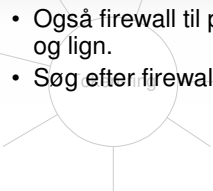

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### Sikkerhed

- Ved opkobling til Internettet har du åbnet et hul til alle brugere i hele verden
- Router filtrerer og sorterer pakker
- Firewall undersøger også indhold
- Også firewall til private – specielt ved ADSL og lign.
- Søg efter firewall



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