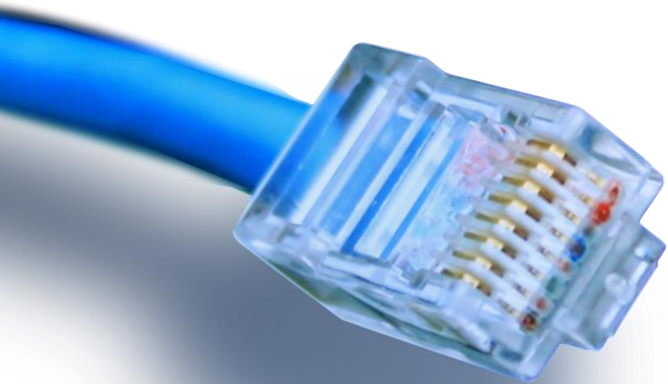


Network



HOUSE OF
TECHNOLOGY



- en del af **mercantec**⁺

Converged Networks

Region Syd Grundlæggende netværk



Emner

- Forbundne enheder
- LAN, WAN og internettet
- Converged Networks



Trends

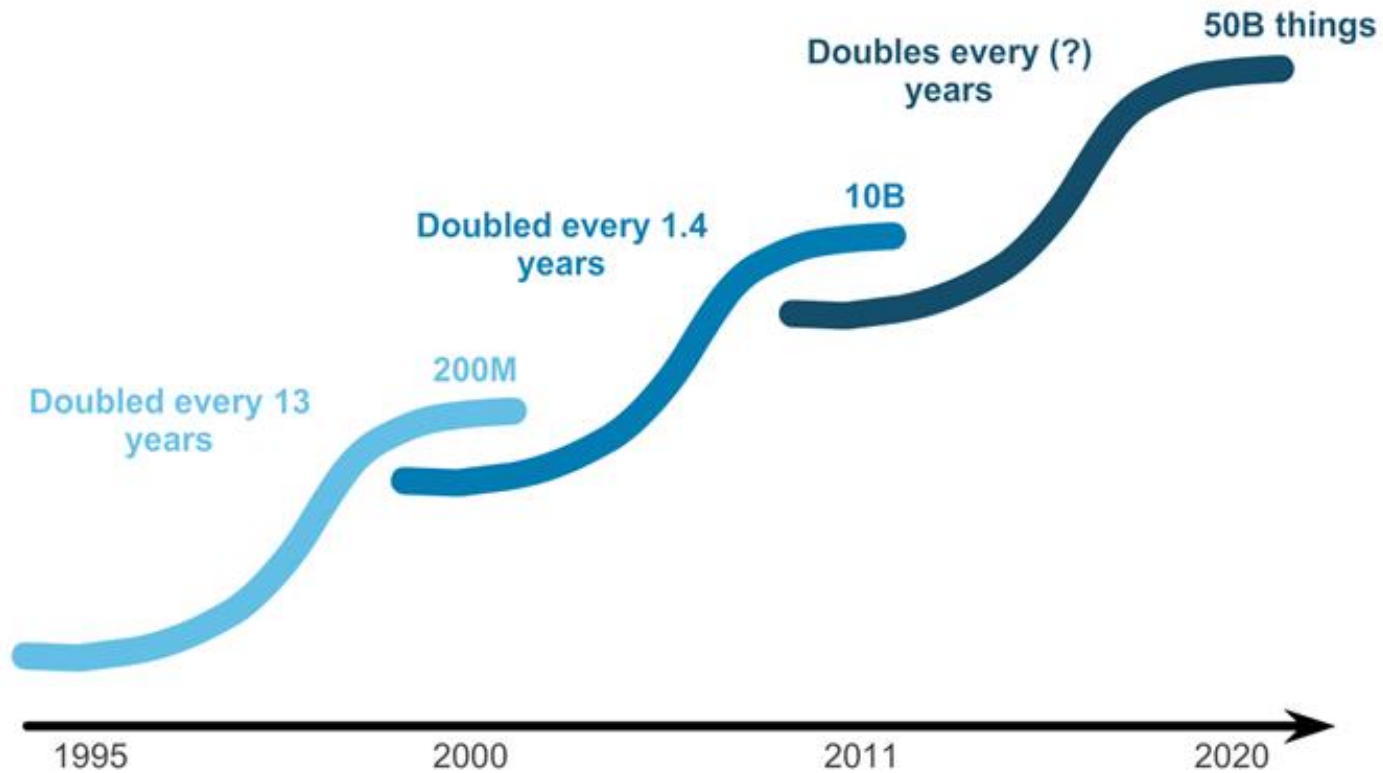


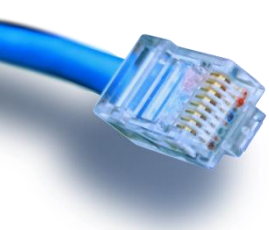
"Fixed" Computing
(You go to the device)

Mobility/BYOD
(The device goes with you)

Internet of Things
(Age of Devices)

Internet of Everything
(People, Process, Data, Things)





Netværks typer

- Gængse netværks typer
 - Local Area Network(LAN)
 - Wide Area Network(WAN)
 - Internettet
- Andre netværks typer
 - Metropolitan Area Network(MAN)
 - Wireless LAN(WLAN)
 - Storage Area Network(SAN)
 - Personal Area Network(PAN)

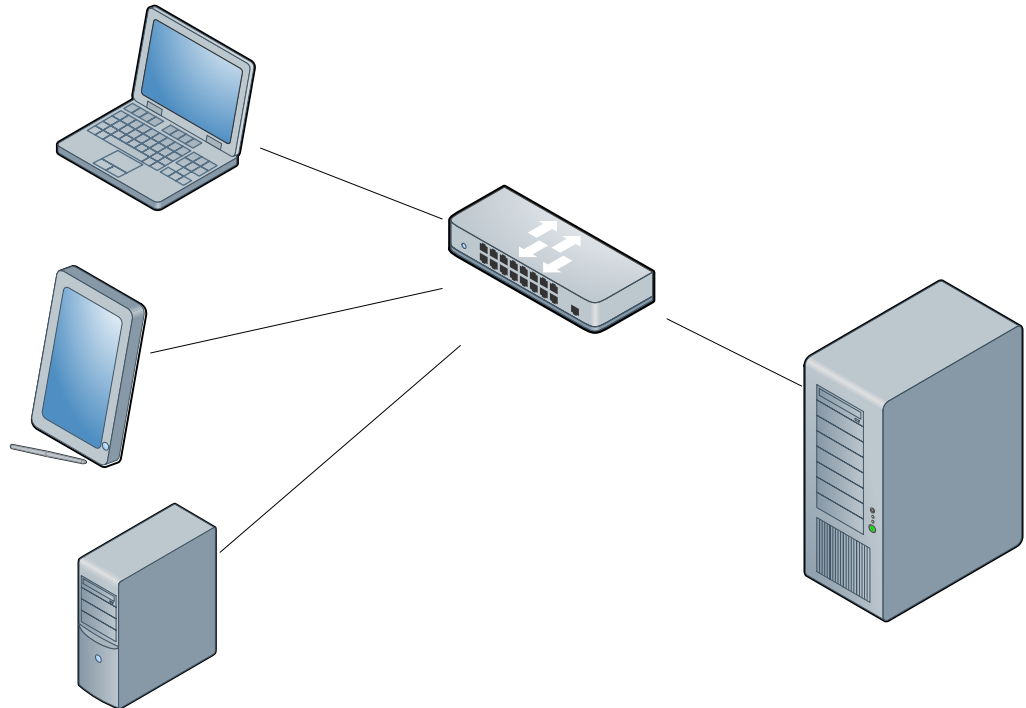


LAN Netværk



- Local Area Network

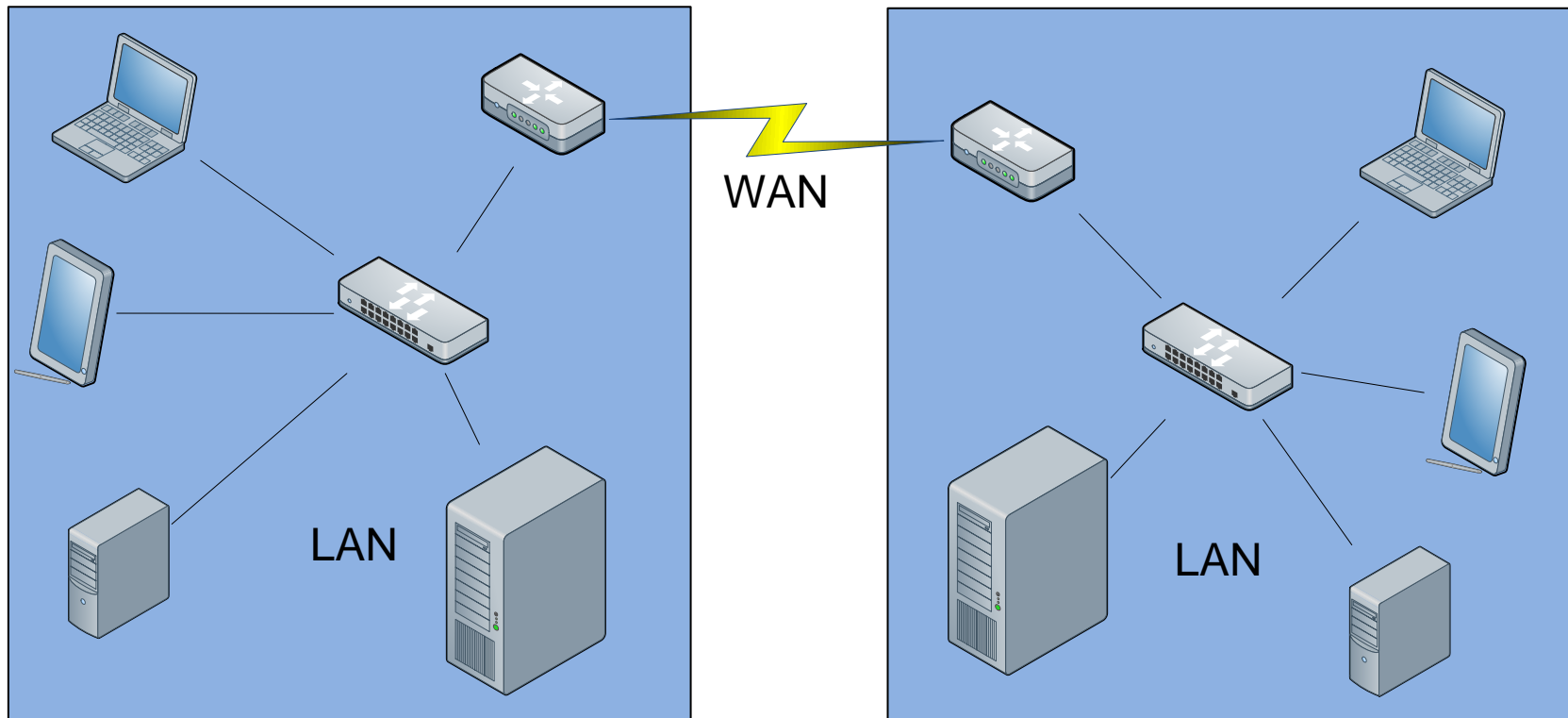
- Forbinder enheder inden for et begrænset geografisk område
- Hjemmet, bygningen, campus'et





WAN Netværk

- Wide Area Network
 - Forbinder geografisk adskilte netværk
 - På tværs af landet, lande, stater

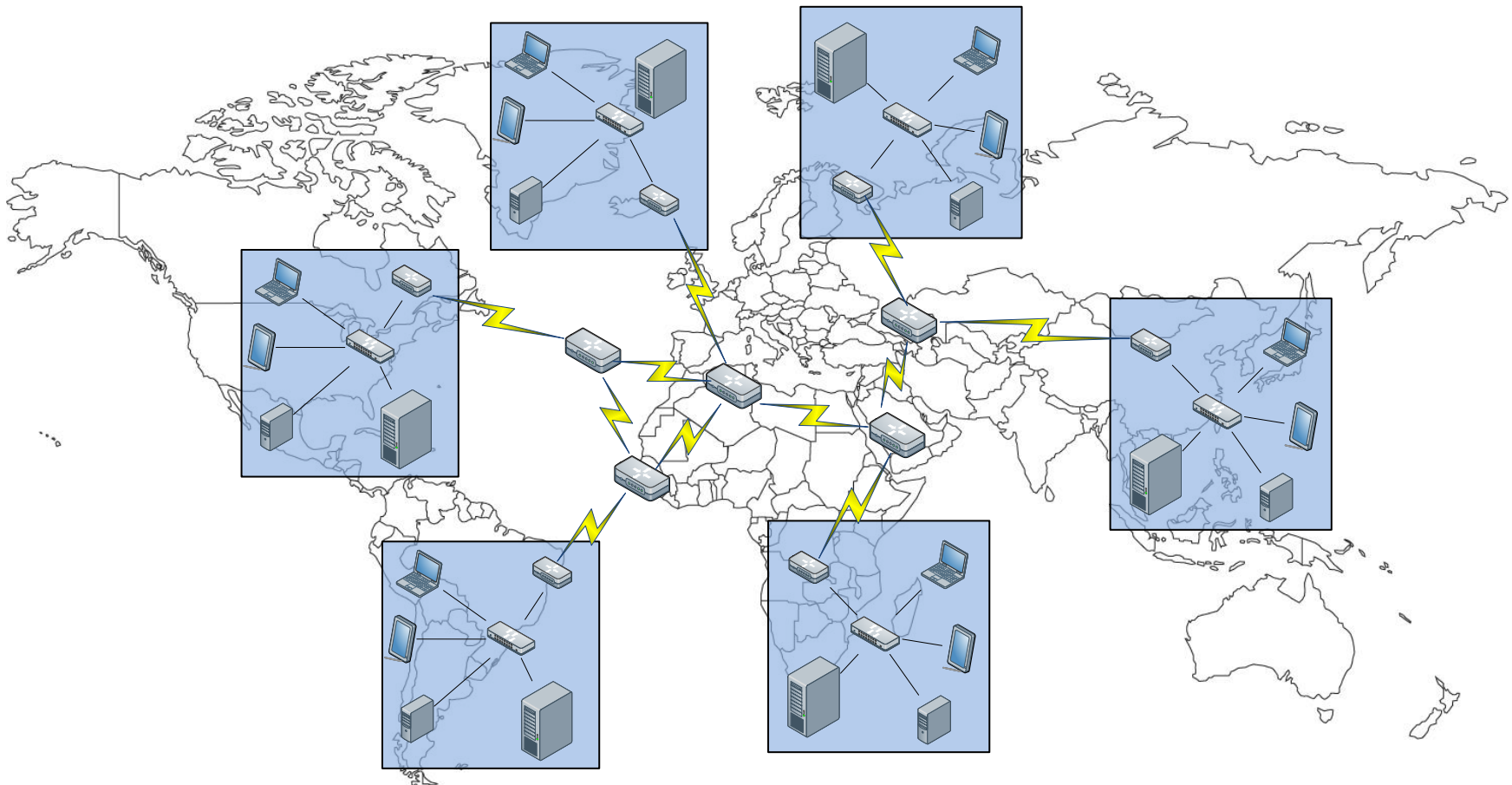




Internettet

- Internet

- Flere LANs og WANs sammenkobles til internettet

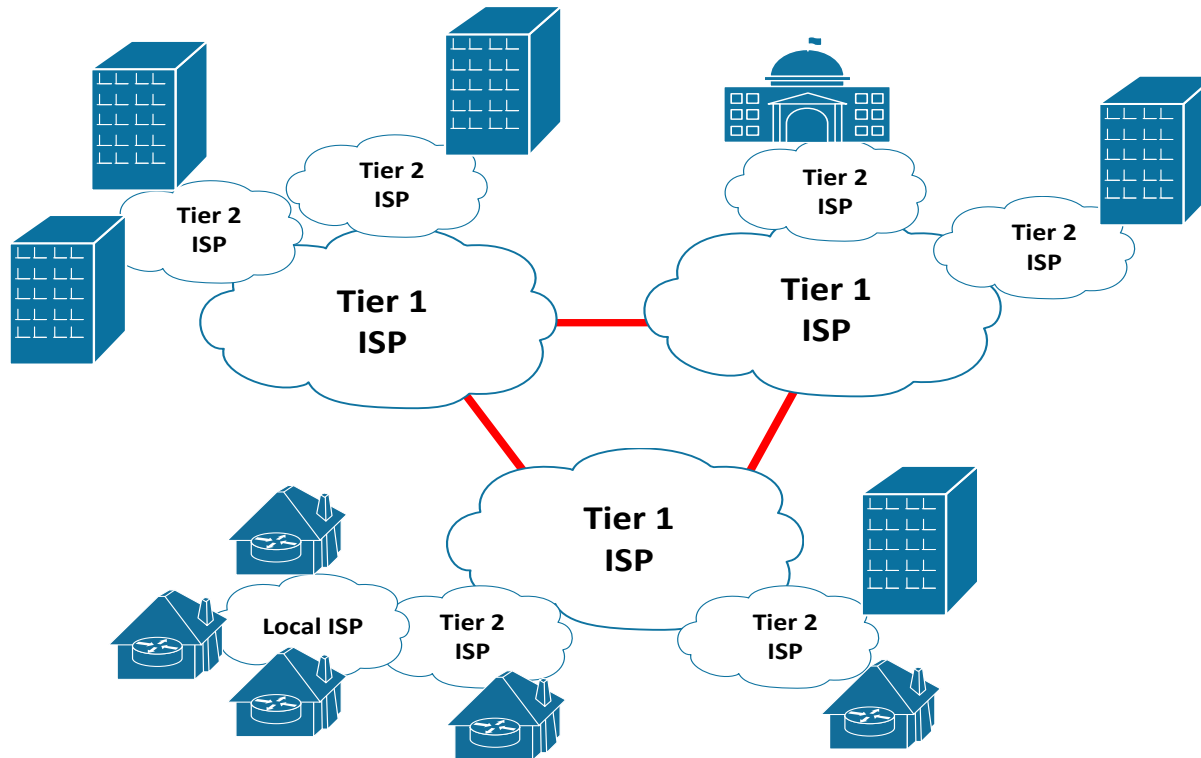




Internettet



- Internet
 - Hierarkisk opbygget





Trends

- Nye strømninger
 - Bring Your Own Device (BYOD)
 - Collaboration
 - Video
 - Cloud Computing
 - IoT



BYOD



- Adgang til data fra alle enheder





Collaboration

- Online samarbejde



IP Communication



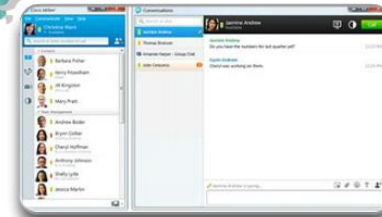
Mobile Applications



Telepresence



Online Conferencing



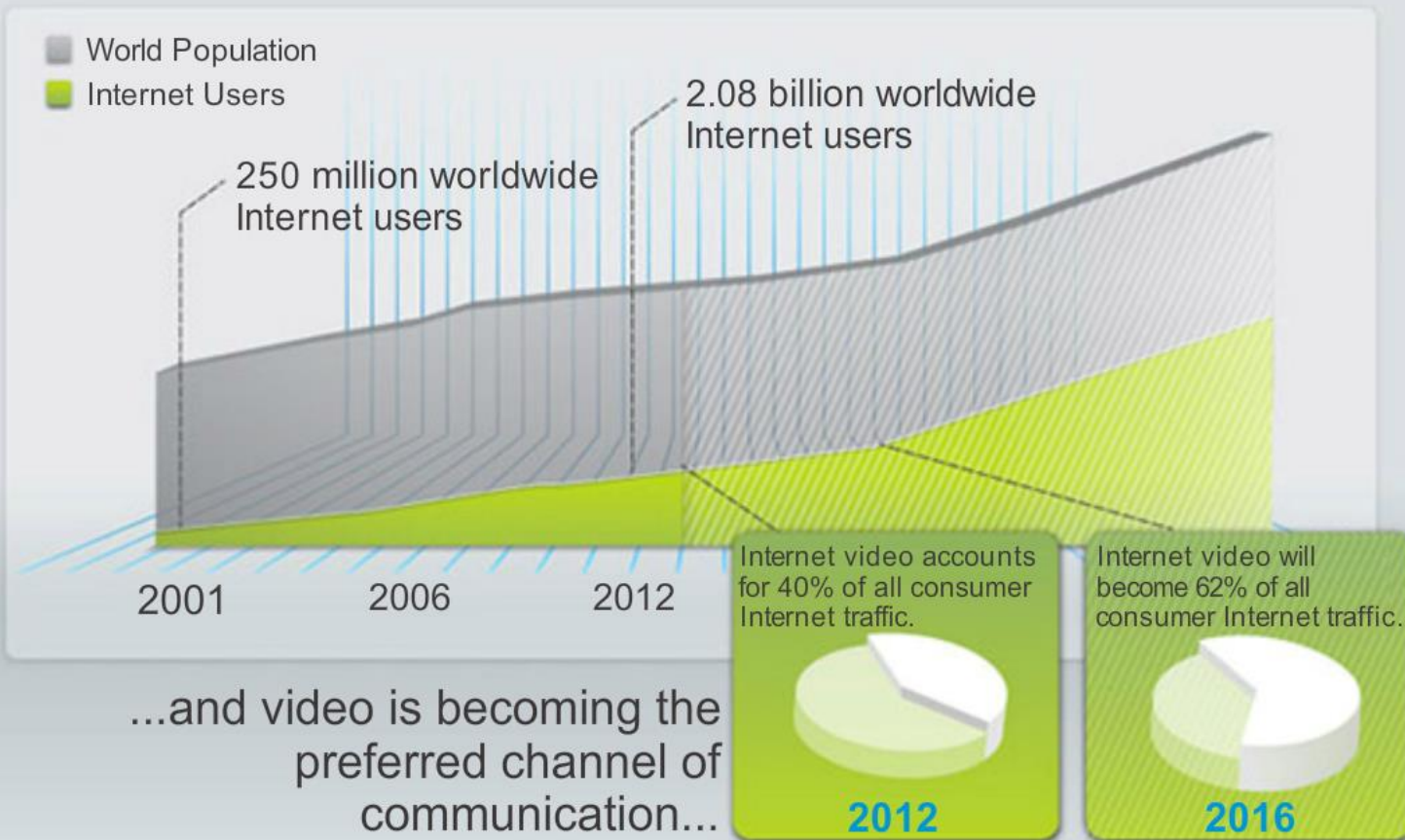
Messaging



Video

- Video kommunikation

People are becoming more connected...





Cloud



- Cloud Typer

- Public
- Private
- Custom
- Hybrid

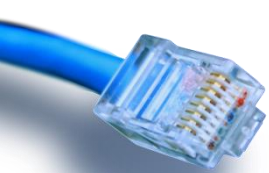




Data Centre

- Indeholder Servere, computer kraft og datalager
 - Redundante forbindelser
 - Virtuelle Servere
 - Storage systemer
 - Redundant strøm/nødstrøm
 - Klima kontrol
 - Sikkerhed



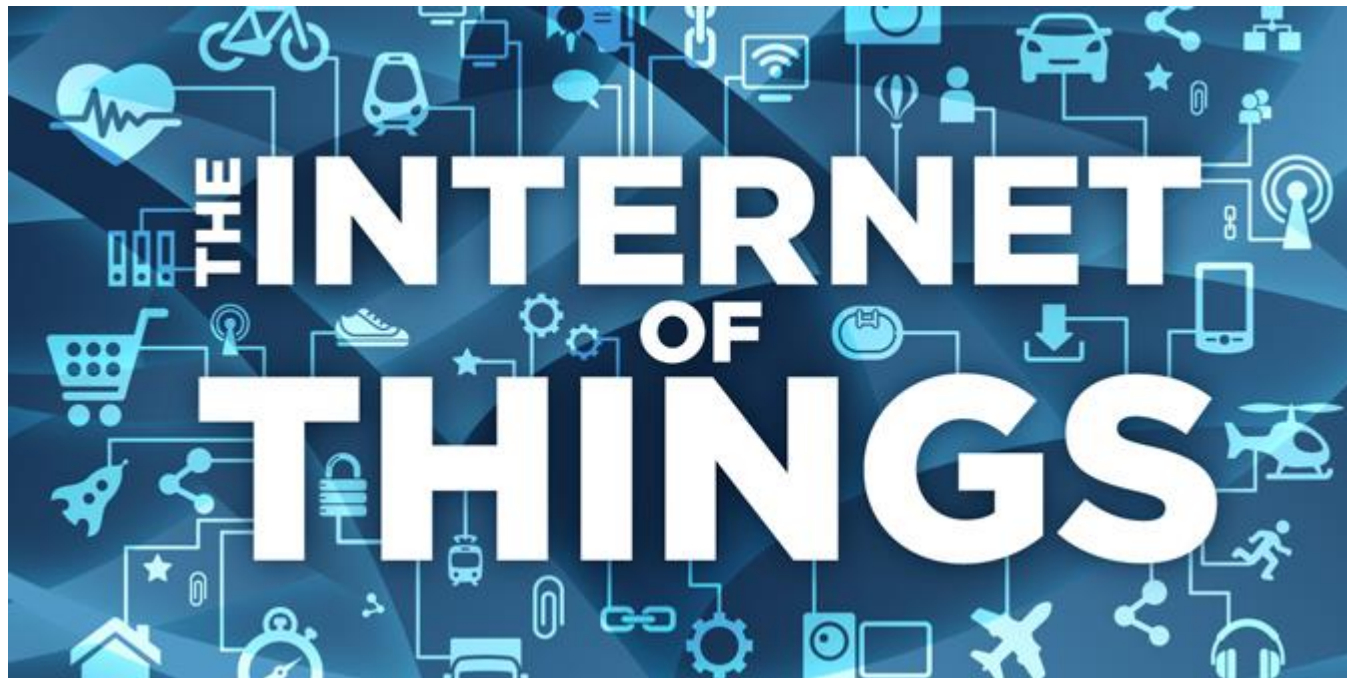


IoT



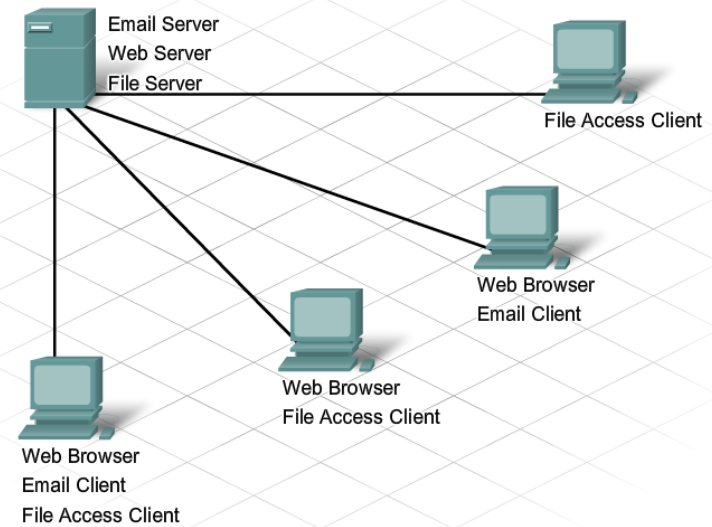
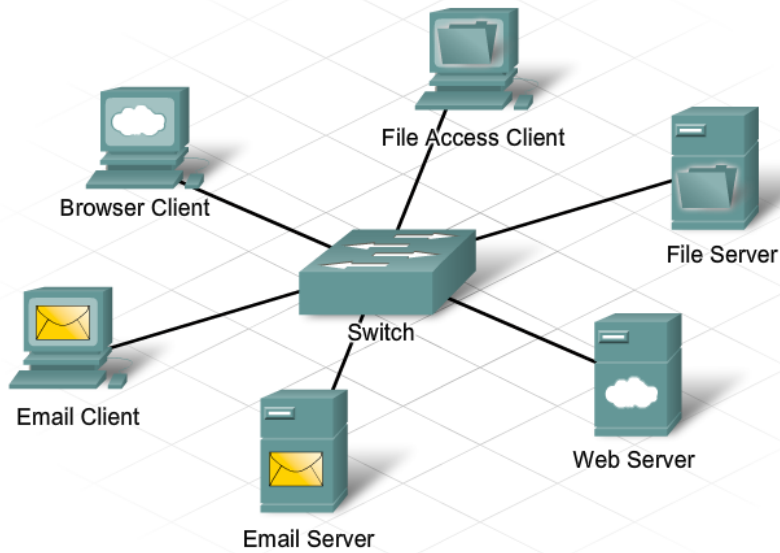
- Internet of Things

- Biler
- Vægte
- Kaffemaskiner





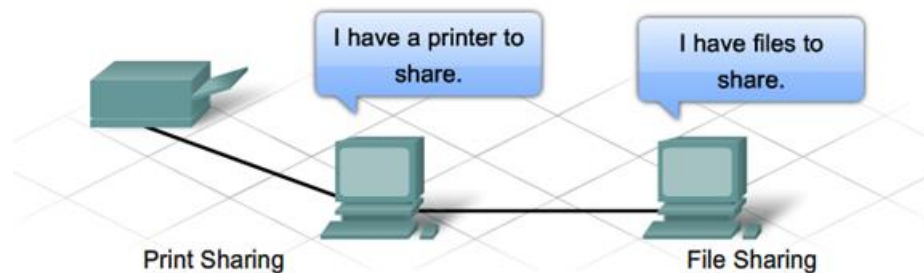
Klient - Server

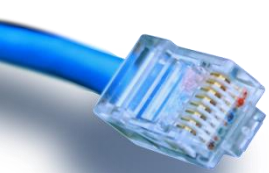




Peer-2-Peer

- Fordele
 - Hurtig opsætning
 - Lille kompleksitet
 - Lille omkostning da dedikerede enheder og servere ikke er nødvendig.
 - Bruges mest til simple opgaver.
- Ulemper
 - Ingen centraliseret administration
 - Mindre sikkerhed
 - Alle enheder skal være både server og klient, hvilket kan have indflydelse på performance.

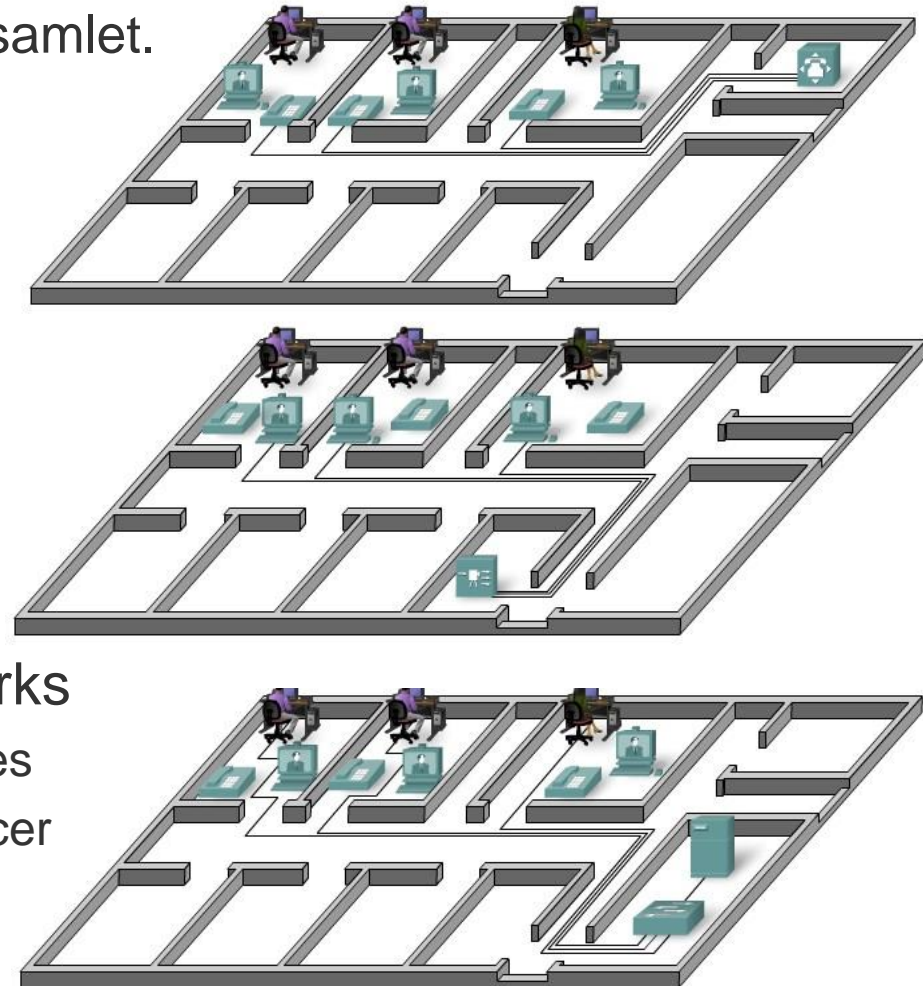
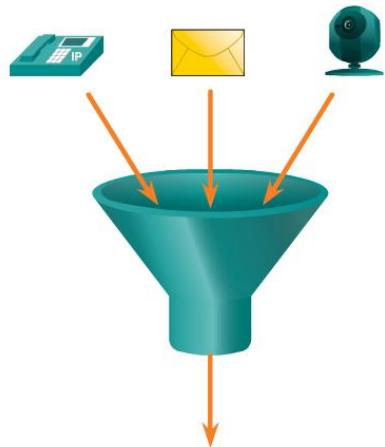




Converged Networks



- Netværk bliver mere og mere komplekse
- Tidligere adskilte netværk bliver samlet.
 - Voice
 - Video
 - Data
 - Medicinsk
- Større krav til
 - Oppetid
 - Sikkerhed
 - Quality of Service(QoS)
- Fordele ved converged networks
 - Kun et netværk skal vedligeholdes
 - Integration af forskellige ressourcer





Converged Networks

Today

- Separate per vendor Networks
- Physical Separation
- Separate Administration and Management Domains
- Higher TCO

Network A

IV Pumps



Network B

Ventilators

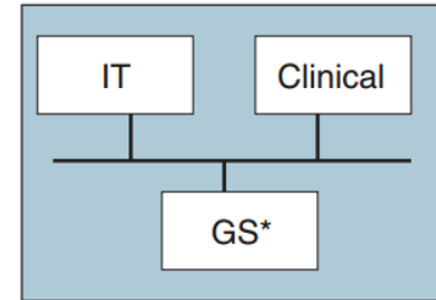


Network C

Patient Monitors



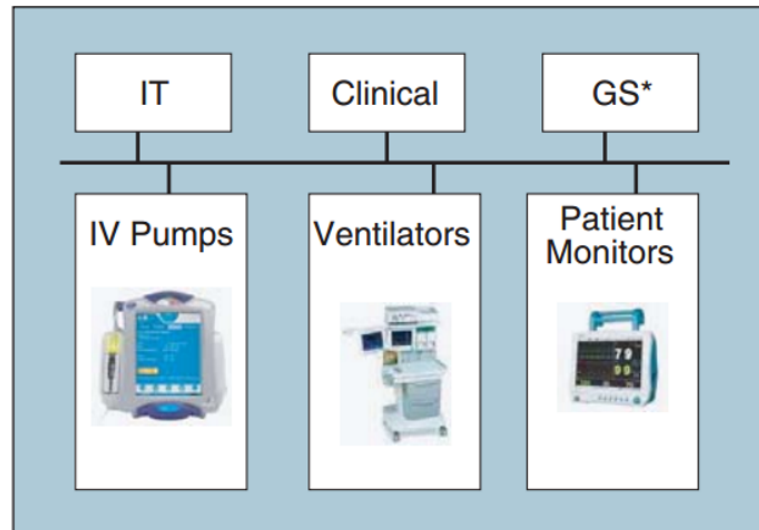
IP Network



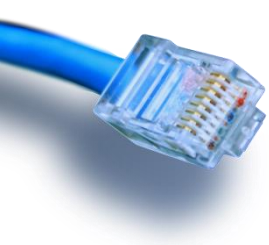
After Convergence

- Converged Network
- Logical Separation
- Single Administration and Management Domain
- Lower TCO

Converged IP Network

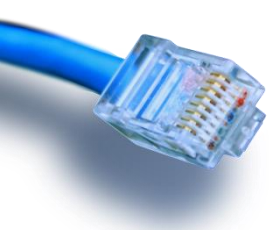


*Guest Services



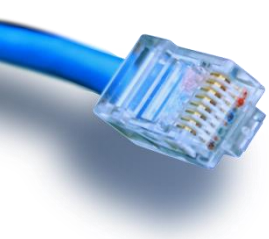
Medical Grade Networks

- Protected (Sikker)
- Interactive (Samvirkende)
- Responsive (Lydhør)
- Resilient (Elastisk)



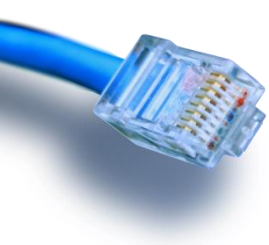
Medical Grade Networks

- Protected (Sikker)
 - Elektronisk patient information bør beskyttes på netværkt. Både aktiv og passiv data
 - Forskellige standarder findes på området
 - HIPAA(US)
 - PIPEDA(Canada)
 - 95/46/EC(EU)
 - Eksempler:
 - Segmentering, kryptering, firewalls, fysisk sikkerhed



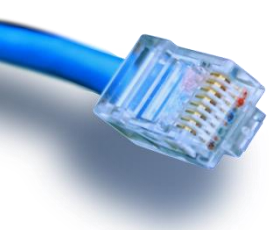
Medical Grade Networks

- Interactive (Samvirkende)
 - Det skal være muligt for personalet at få adgang til netværk og data på netværket.
 - Kablet adgang ved faste stationer
 - Trådløs adgang ved ”flydende” stationer
 - Sikkerheden skal stadig være intakt.
 - Eksempler:
 - Kabel, wireless, VPN –Intra/Extra



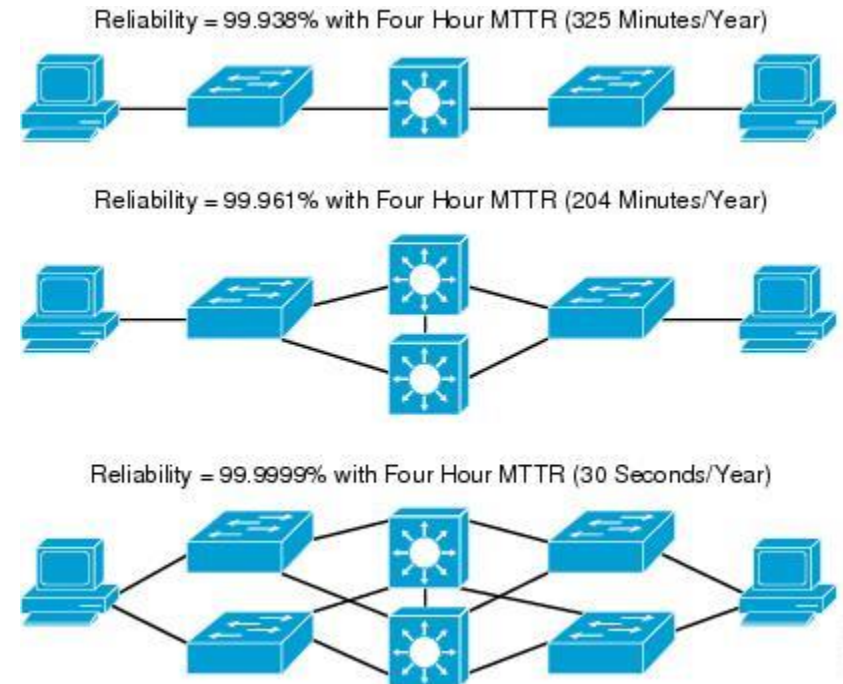
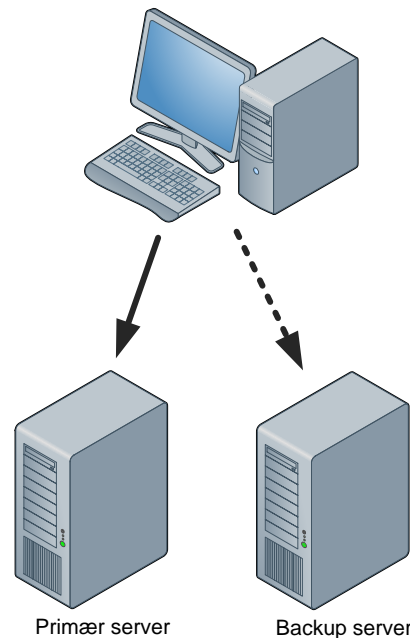
Medical Grade Networks

- Responsive (Lydhør)
 - Netværket skal kunne tilpasse sig ændrende behov
 - Fra Organisationen
 - Nye produkter
 - Nye arbejdsgange
 - Supportere nye enheder og teknologier
 - Stadig under hensyntagen til sikkerhed



Medical Grade Networks

- Resilient (Elastisk)
 - High Availability – Høj tilgængelighed
 - Redundante fremføringer
 - Backup systemer
 - Nødstrøm

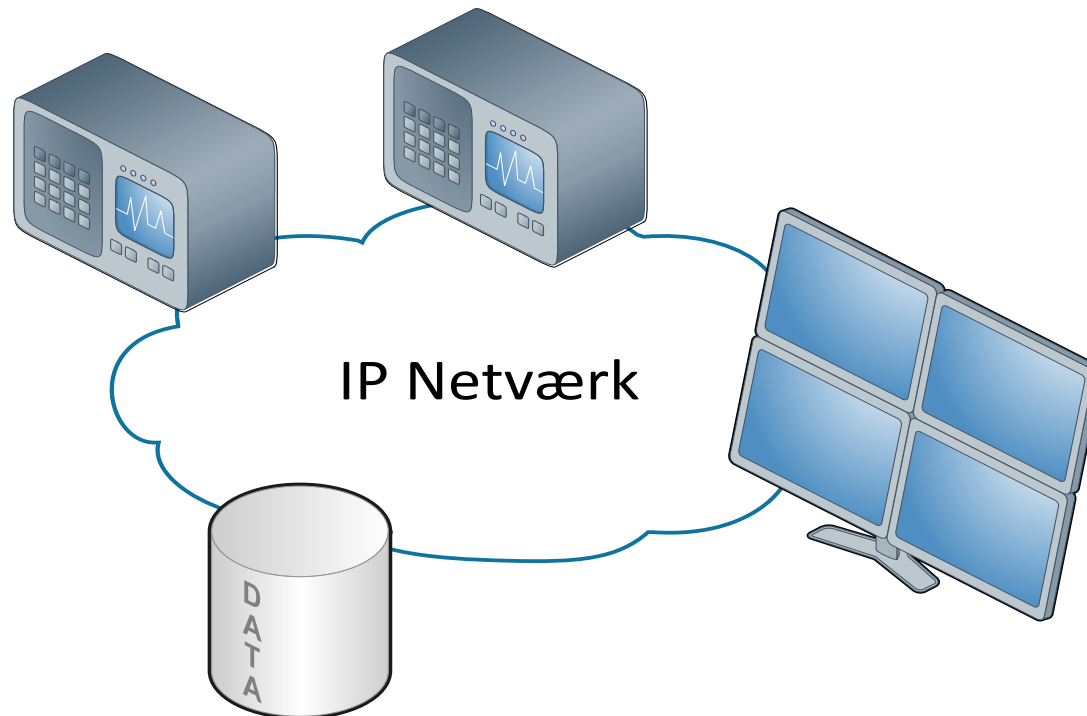




Medical Grade Networks



- Biomedicinsk Udstyr

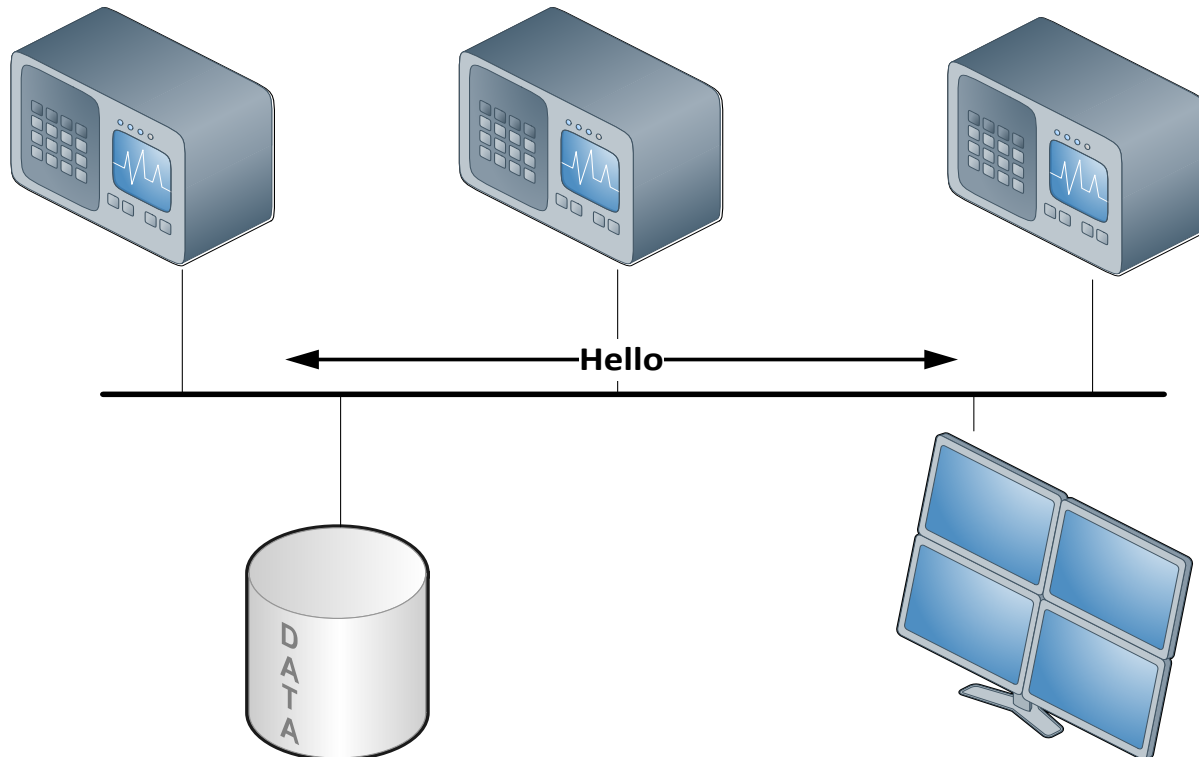


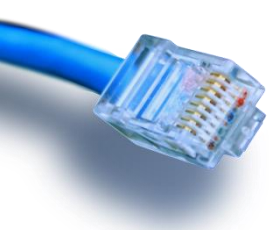


Medical Grade Networks



- Hvilke krav stiller udstyret til netværket?
 - Lag 2 naboskaber
 - På tværs af store lokationer?





Medical Grade Networks

- Hvilke krav stiller udstyret til netværket?
 - Lag 3 understøttelse
- Fordele
 - Mindre broadcast domains(mere senere)
 - Nemmere fejlfinding
 - Skaleres bedre
 - Større sikkerhed
- Ulemper
 - Mere konfiguration
 - Mere planlægning

