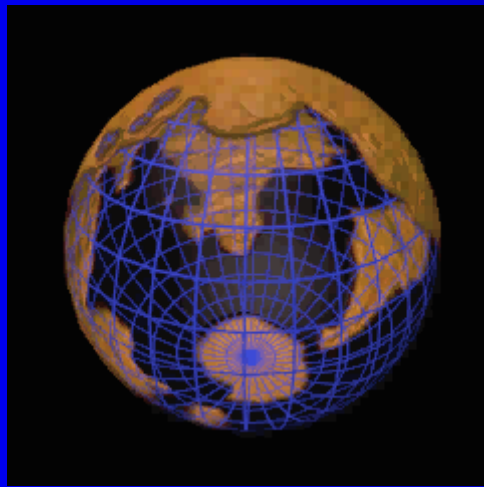


# ISDN

Integrated Services Digital Network

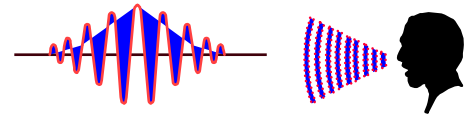


Fra kunde til central

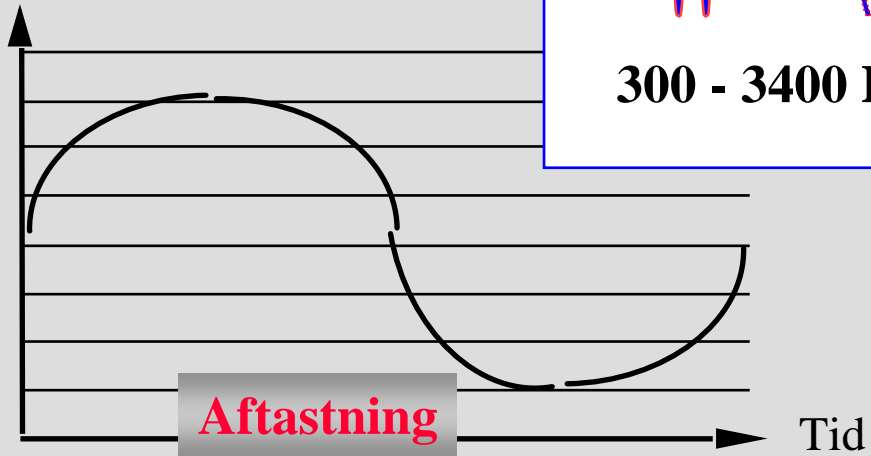
# Digitalisering - Lyd

Amplitude

Analog



300 - 3400 Hz



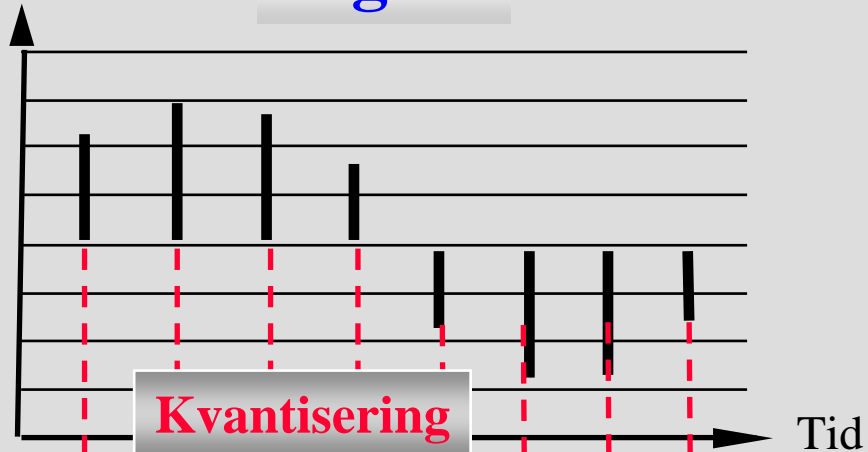
Amplitude

Digital

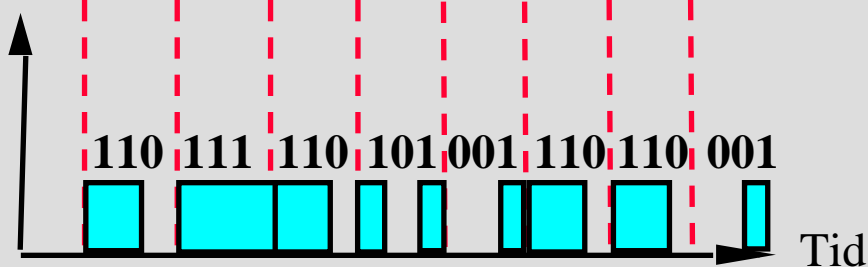
xxxx x111  
xxxx x110  
xxxx x101  
xxxx x100  
xxxx x000  
xxxx x001  
xxxx x110  
xxxx x011

Kvantisering

Amplitude



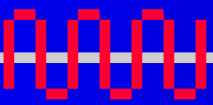
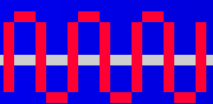

Amplitude

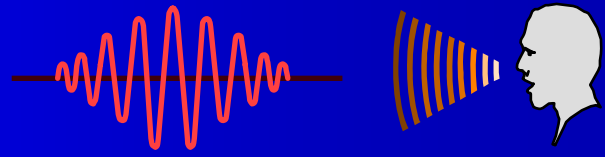
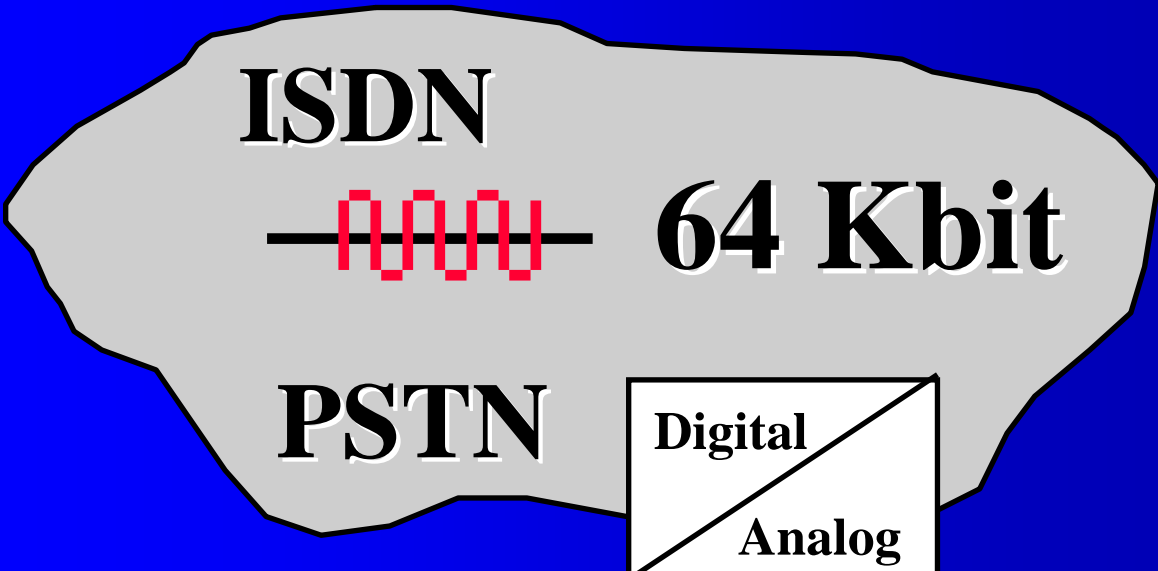
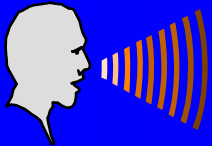


Kodning PCM

**8000 aflæsninger pr. sek. x 8bit =  
64.000 bit/sek**

# ISDN 2

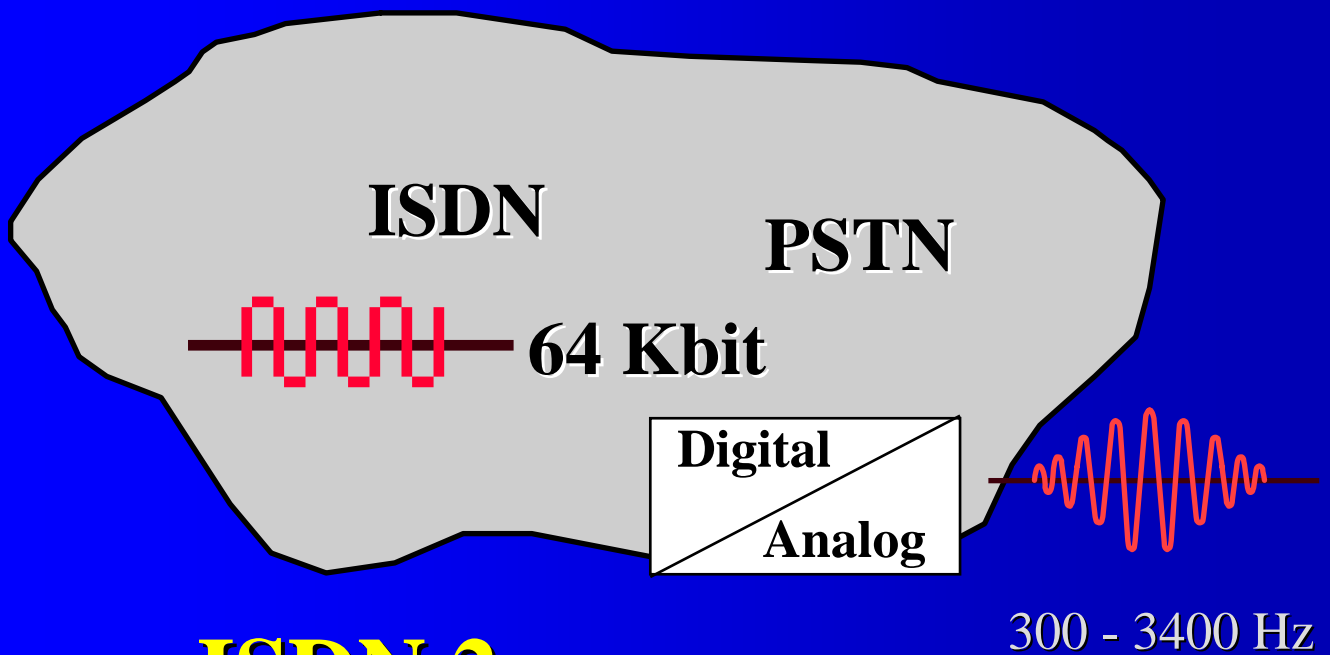
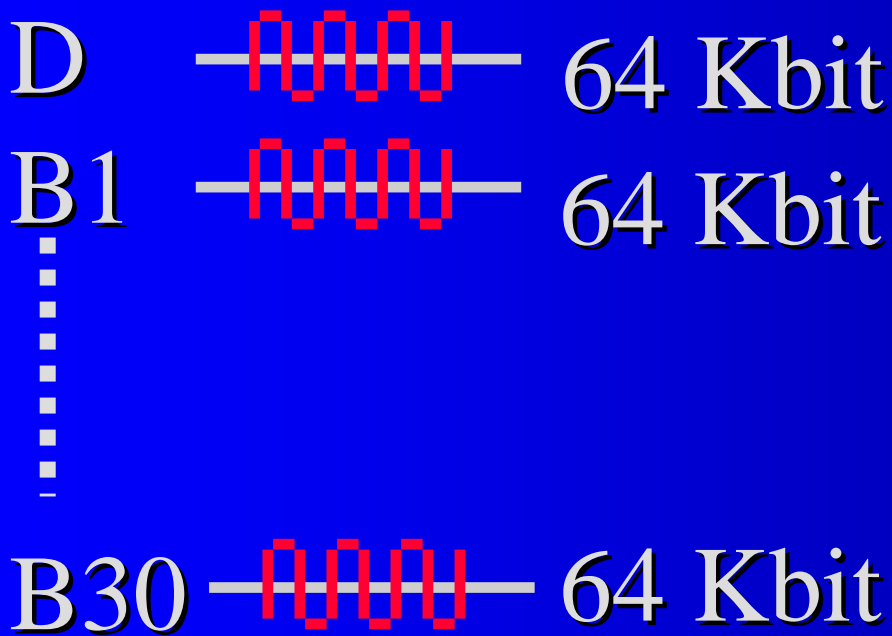
D —  — 16 Kbit  
B —  — 64 Kbit  
B —  — 64 Kbit



300 - 3400 Hz

# PSTN

# ISDN 30



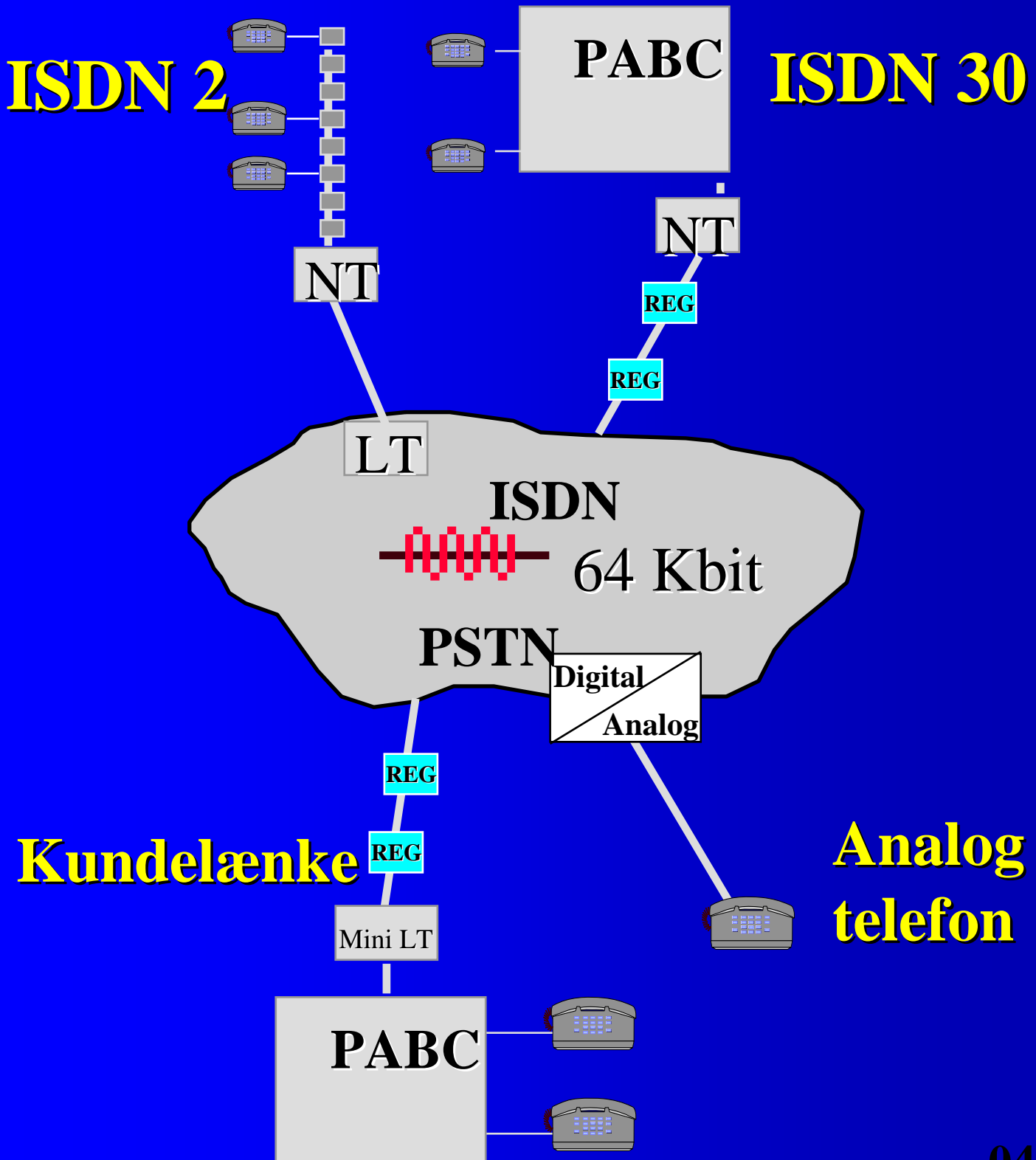
# ISDN 2



**PSTN**

# Sammenspil mellem nettene

## 3,1 Khz audio



# Sammenspil mellem nettene

## DATA 64 Kbit

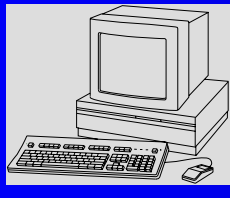
### ISDN 2

### ISDN 30



### ISDN 2

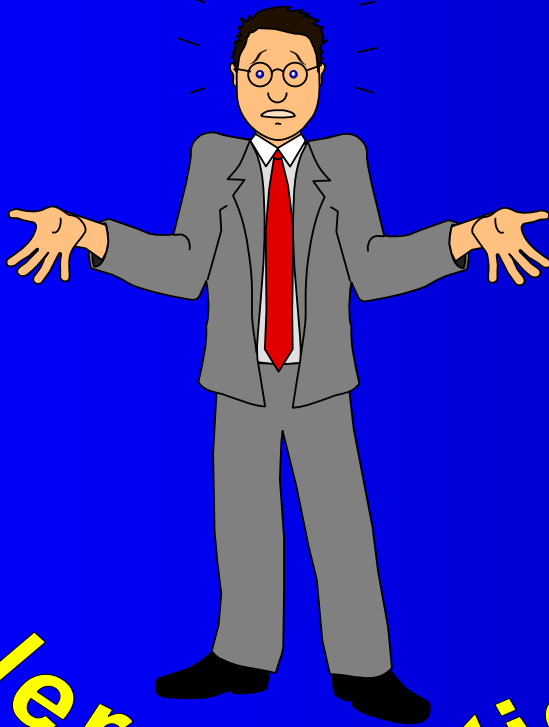
NT



Basistjenester

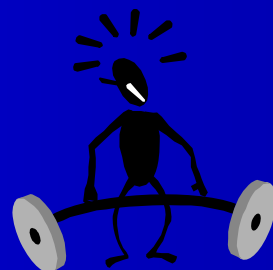
Bæretjeneste

Teletjeneste



Supplerende tjenester

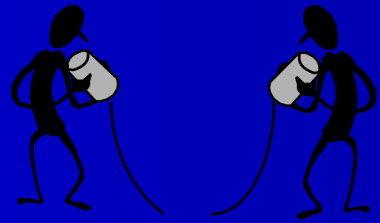
# Bæretjenester



- ★ **Kredsløbskoblet 64 kbit/s  
transparent**
- ★ **Kredsløbskoblet 64 kbit/s  
til tale**
- ★ **Kredsløbskoblet 64 kbit/s  
til 3,1 kHz audio**



# Teletjenester

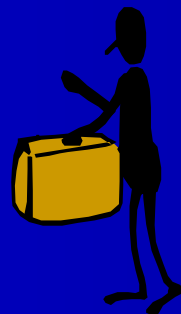


- ★ **Telefoni (3,1 kHz)**
- ★ **Teletex** (note 2)
- ★ **Telefax gruppe 4** (note 1)
- ★ **Teletex/Telefax gr. 4 -mixed mode** (note 1)
- ★ **Telefax - gruppe 2/3** (note 1)
- ★ **Videotex** (note 1)
- ★ **Telex** (note 2)
- ★ **MHS** (note 1)
- ★ **OSI-applikationer** (note 1)

**note 1: Nettet understøtter alene bærertjenesten og tjenesteindikatorer indenfor ISDN.**

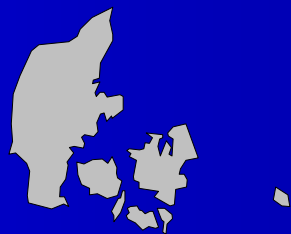
**note 2: Som note 1. Nettet understøtter ikke samtrafik med Datex og Telex-nettene.**

# Supplerende tjenester



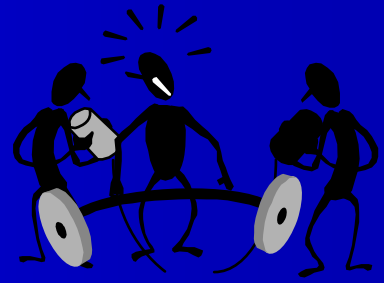
- ★ **Direkte nummer (DDI)**
- ★ **Ekstra nummer (MSN)**
- ★ **Terminaladresse (SUB)**
- ★ **Præsentation (CLIP)**
- ★ **Undlad præsentation (CLIR)**
- ★ **Lukket brugergruppe (CUG)**
- ★ **Kort meddelelse (UUS)**
- ★ **Parkering (HOLD)**
- ★ **Banke på (CW)**
- ★ **Flytning/skift af terminal (TP)**
  
- ★ **= Indeholdt i standardabn.**

# Nationale Supplerende tjenester



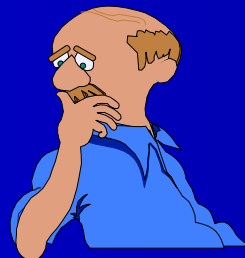
- ★ **Sammenmærkning (LH)**
- ★ **Spærring for afgående opkald  
(total/region/udland/service 902/903)**
- ★ **Telefonvagt**

# Basistjenester (Terminaltype)



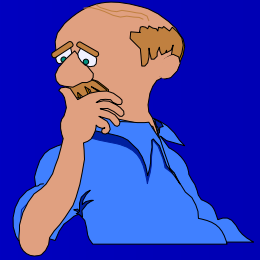
- ★ **Transparent digital information**
- ★ **Tale**
- ★ **Audio 3.1 kHz**
- ★ **Telefoni 3.1 kHz**
- ★ **Telefax gruppe 2 / 3**
- ★ **Telefax gruppe 4**
- ★ **Teletex**
- ★ **Videotex**
- ★ **Videotelefoni**

# Nye tjenester



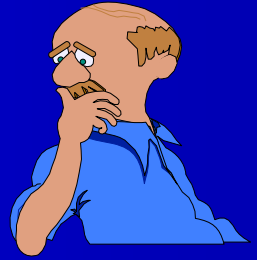
- ★ **Call Forwarding Unconditional (CFU)**  
**Viderestilling af alle kald**
- ★ **Call Forwarding on NO Reply (CFNR)**  
**Viderestilling ved manglende svar**
- ★ **Call Forwarding Busy (CFB)**  
**Viderestilling ved optaget**
- ★ **Completion of Call to Busy Subscriber (CCBS)**  
**Ring igen**
- ★ **Advice Of Charge at the end of the Call (AOC-E)**  
**Takstoplysning ved afslutning**
- ★ **Line Hunting (LH)**  
**Søgning**
- ★ **Outgoing Call Barring User Controlled (OCB-UC)**  
**Bruger styret spærring**

# Nye tjenester



- ★ **Call Deflection (CD)**  
**Brugerstyret viderestilling**
- ★ **Three ParTY service (3PTY)**  
**Trepartstjeneste**
- ★ **Advice of Charge at call Set-up (AOC-S)**  
**Takstoplysning ved opkald**
- ★ **Malicious Call Identification (MCID)**  
**Fangning**
- ★ **Trunk Hunting (TH)**  
**Søgning**
- ★ **Outgoing Call Barring Fixed (OCB-F)**  
**Fast spærring**

# Nye tjenester



**User to User Signalling (UUS1)**  
**Kort meddelelse ( med kvit.)**



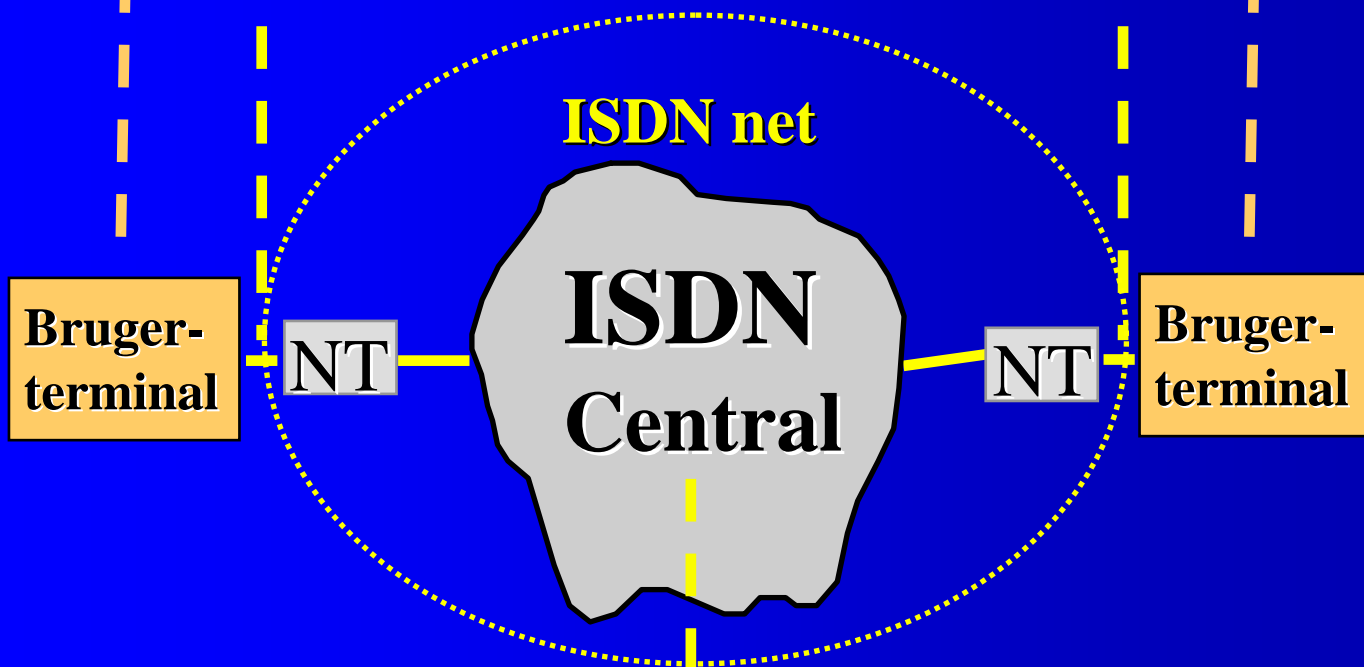
**User to User Signalling (UUS3)**  
**Kort meddelelse**  
**(max 128 karakterer pr. sekund)**

# Teletjenste

Hvad vil terminalen?  
(Telefax G4, telefax G2/3, telefoni, videotex osv.)

# Bærertjenste

Hvilken opkoblingsform tilbyder nettet?  
(3,1Khz, 64Kbit, Speech)



# Supplerende tjenester

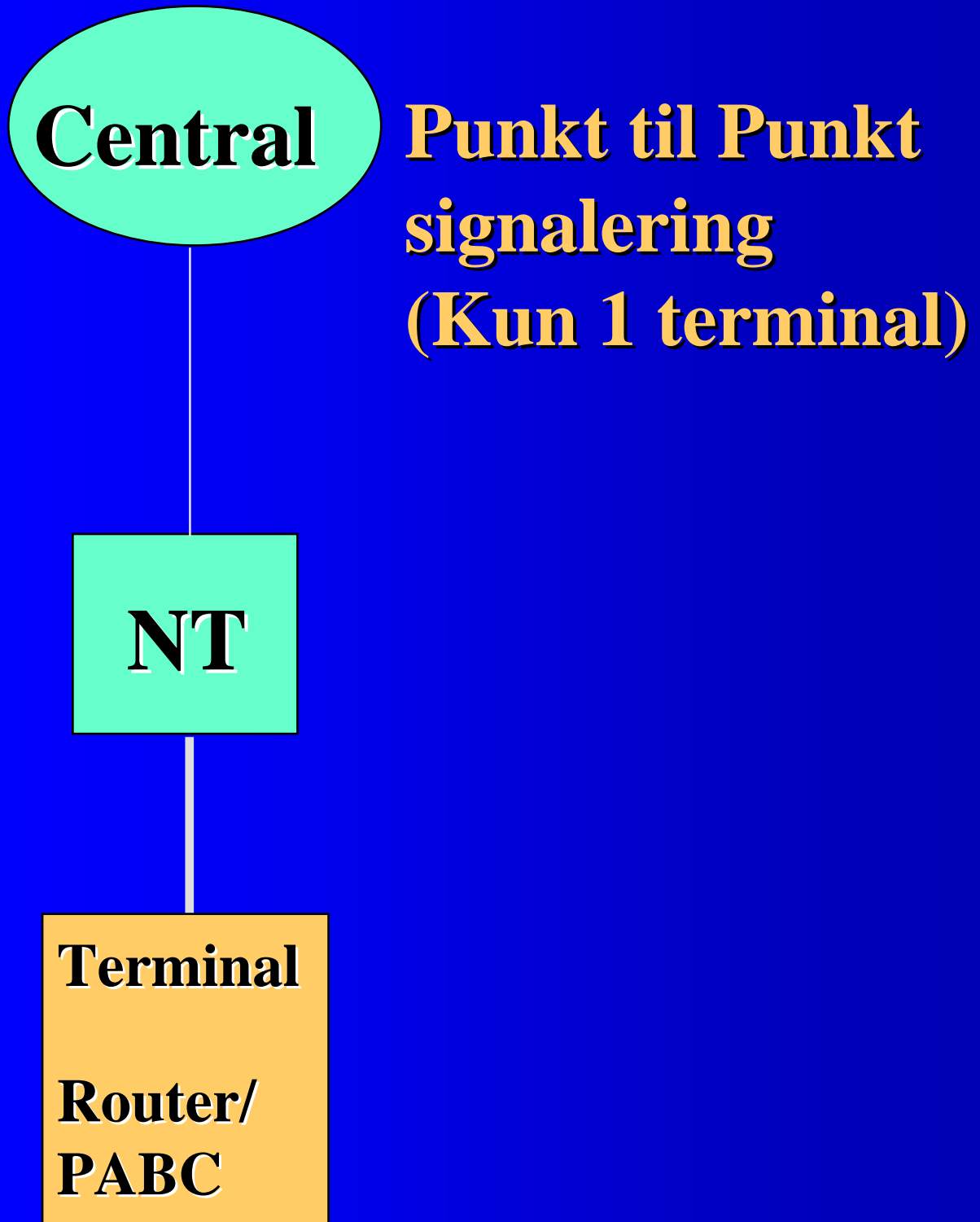
Hvilke særtjenester kan nettet tilbyde?  
(DDI, MSN, SUB, CUG osv.)

# Basistjenste (Terminaltype)

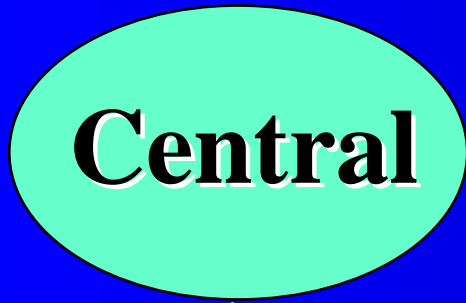
En kombination af Bærer-teletjenester  
Fx. 3,1Khz (bærertj.) og telefax G2/3 (teletj.) er  
en basistjeneste som evt. kunne være i en lukket  
brugergruppe.



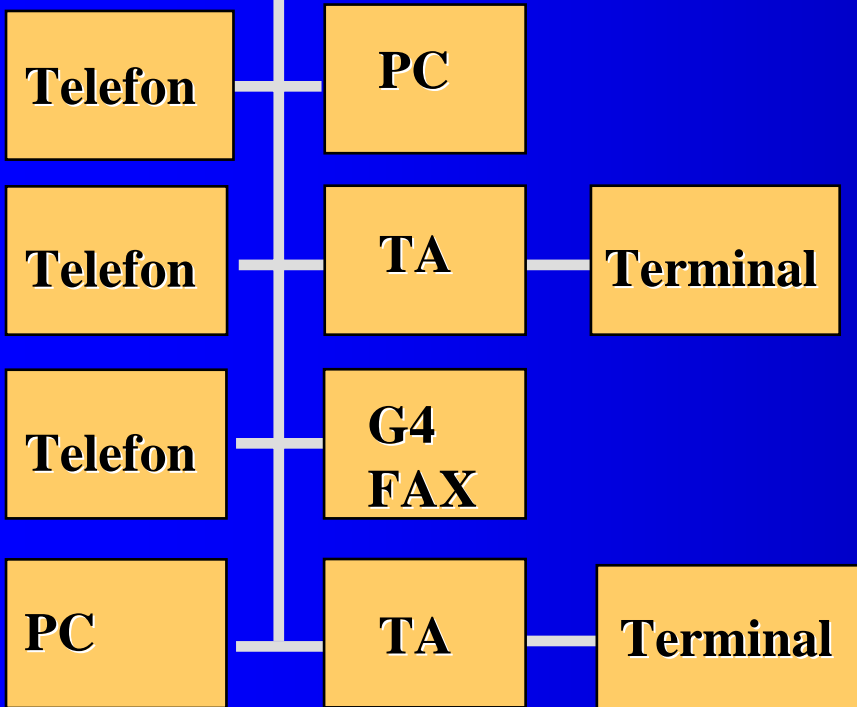
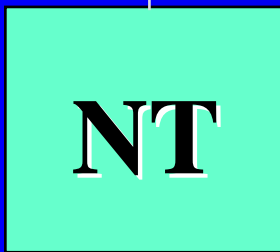
# Basic Rate Access (ISDN2)



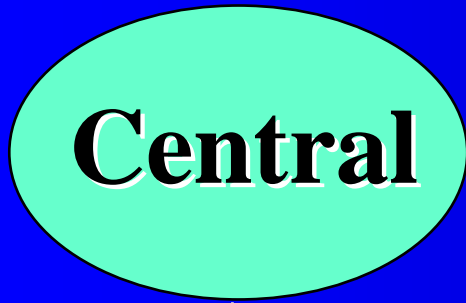
# Basic Rate Access (ISDN2)



Punkt til Multipunkt  
signalering  
(Op til 8 terminaler)



# Basic Rate Access (ISDN2)



Punkt til Multipunkt  
signalering  
(Op til 8 terminaler)



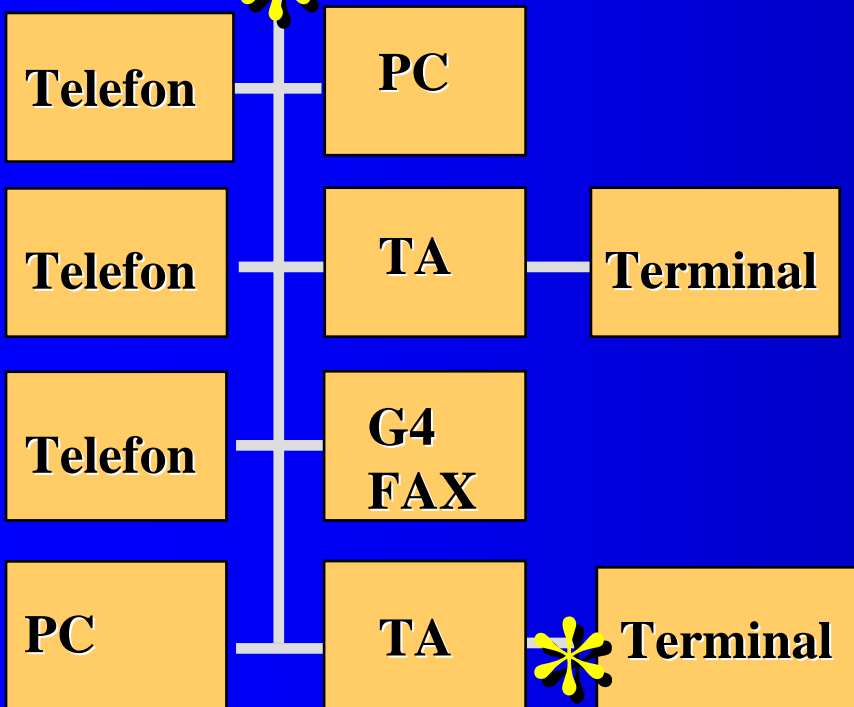
U-snit



T-snit

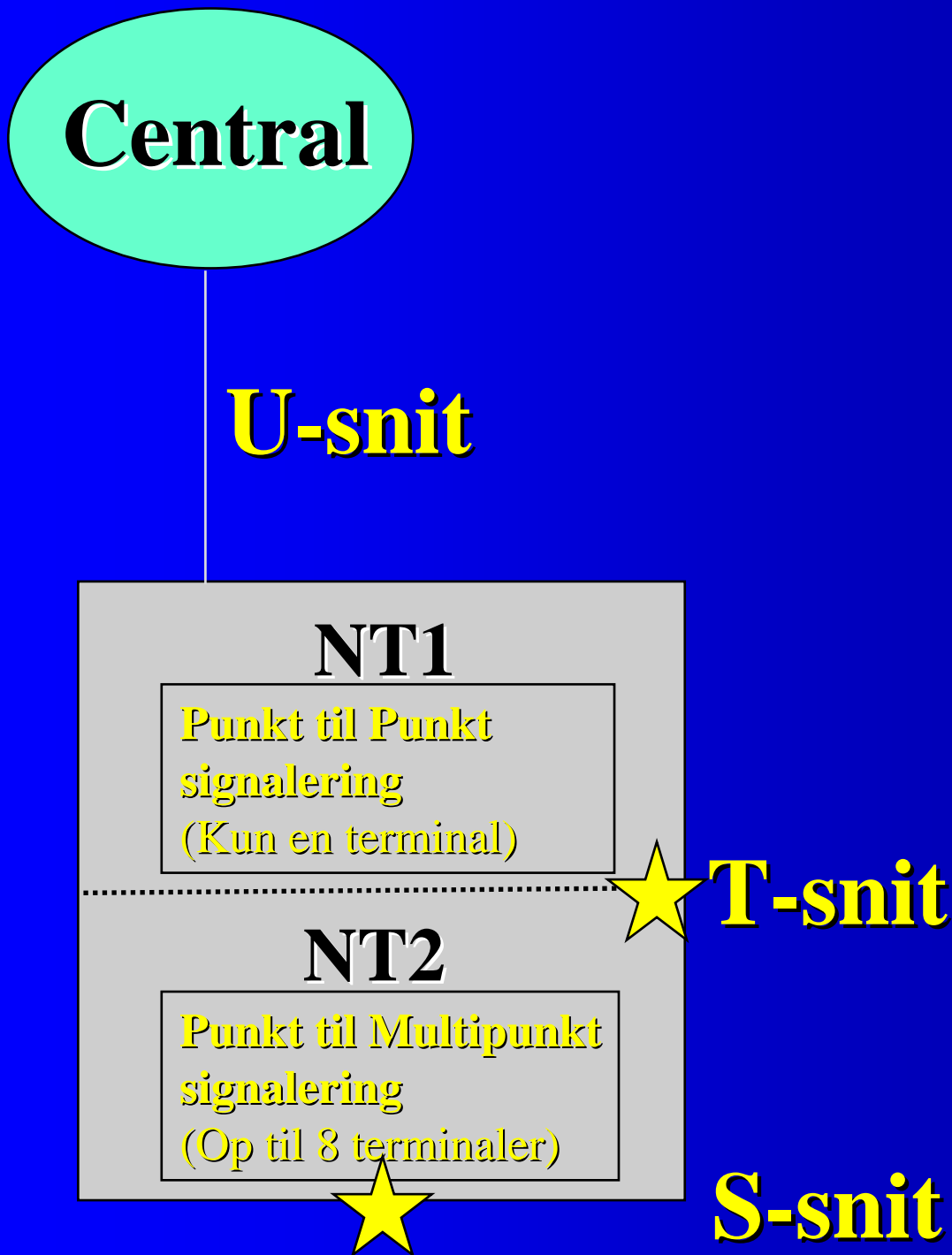


S-snit



R-snit

# Basic Rate Access (ISDN2)



Fysisk tilslutning af terminal til T-snit foretages i ISO 8877 stik , som betegnes S/T

# Basic Rate Access (ISDN2)

Linie hastigheder

Central

U-snit

Liniekode = 2B1Q

Linie hastighed = 160Kbit/s

2 Signal-tråde

NT

S-bus

Liniekode = AMI (modificeret)

Linie hastighed = 192Kbit/s

4 Signal-tråde

Telefon

TA

Telefon

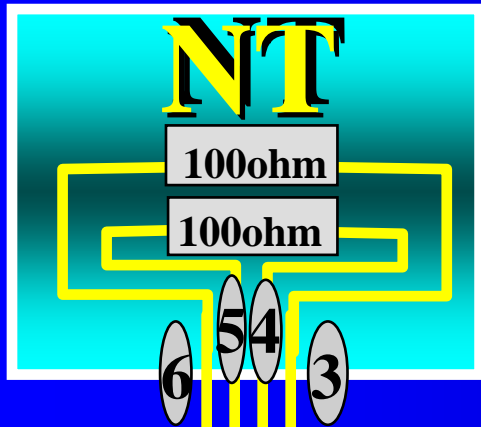
G4  
FAX

PC

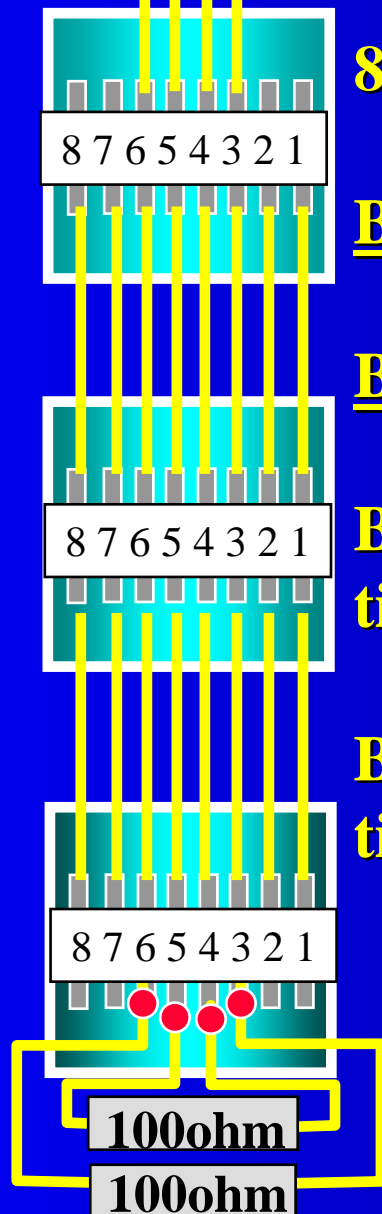
TA

# Basic Rate Access (ISDN2)

## S-bus



6 5 4 3



8 ledninger til S-bus

Ben 4&5 NT til TE

Ben 3&6 TE til NT

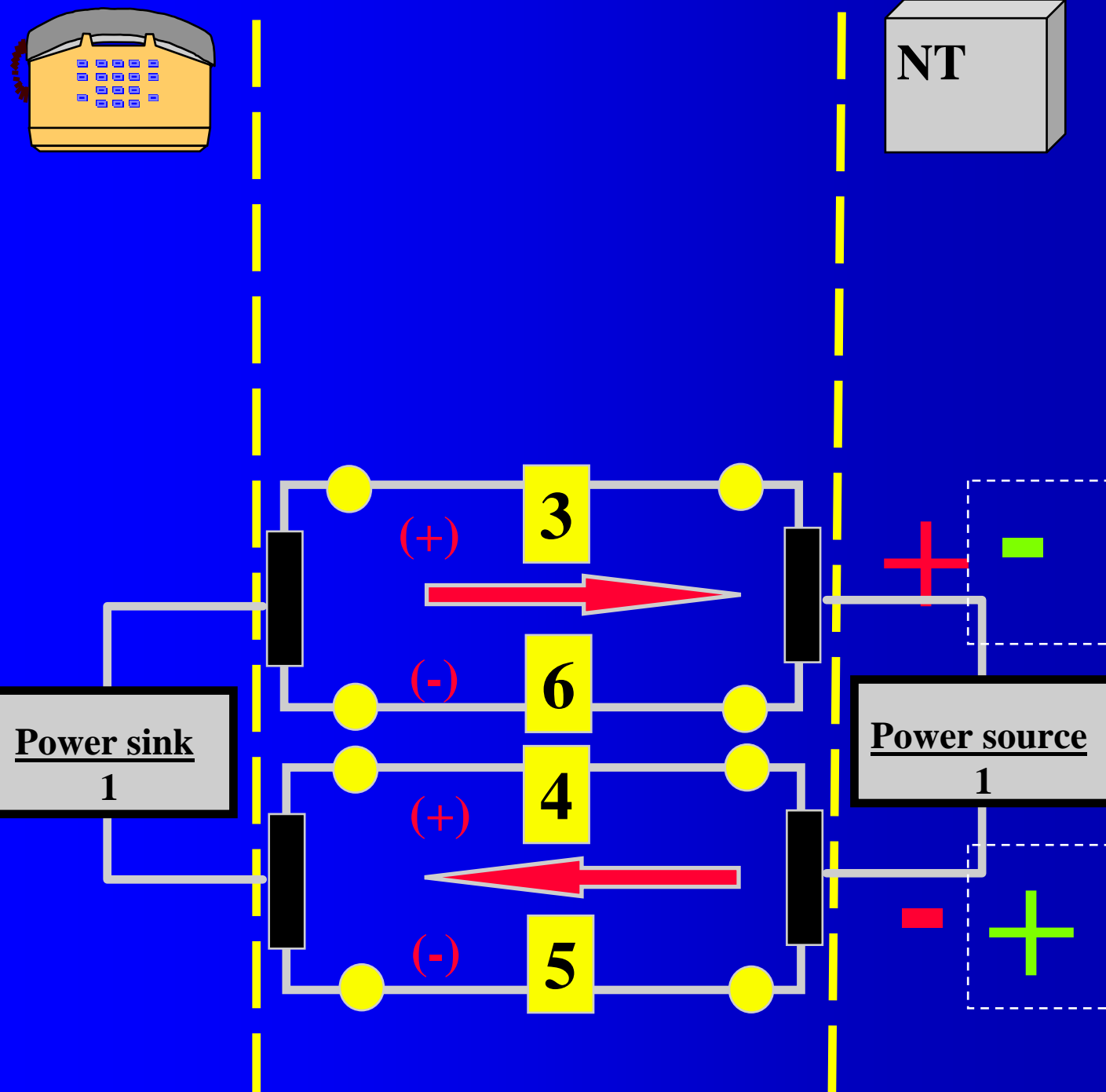
Ben 1&2 reseveret til extern forsyning

Ben 7&8 reseveret til extern forsyning

Sidste stik termineres altid med 100 ohm

# Basic Rate Access (ISDN2)

## S-bus strømforsyning

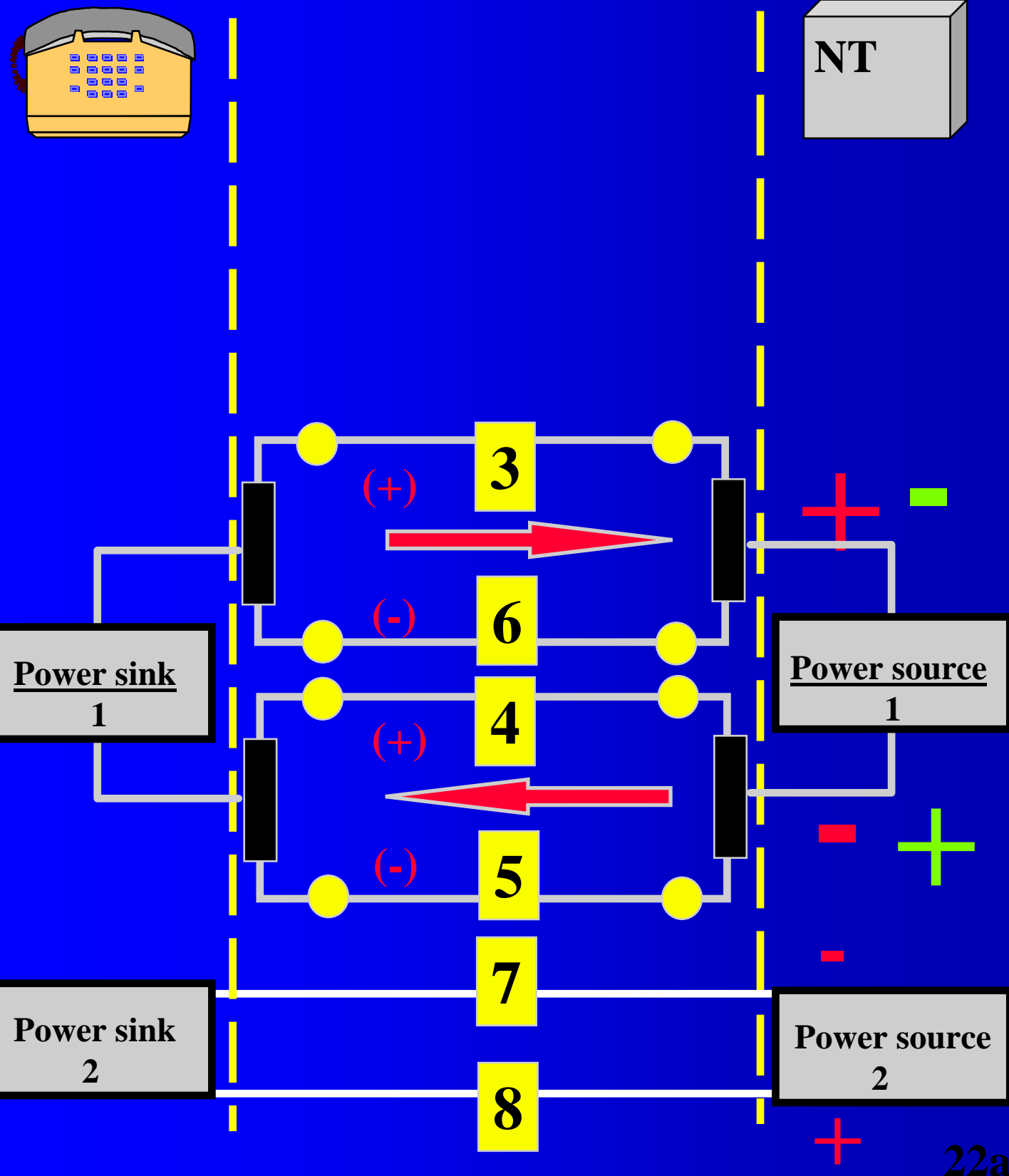


Normal mode med 230V

Restrictet mode uden 230V

# Basic Rate Access (ISDN2)

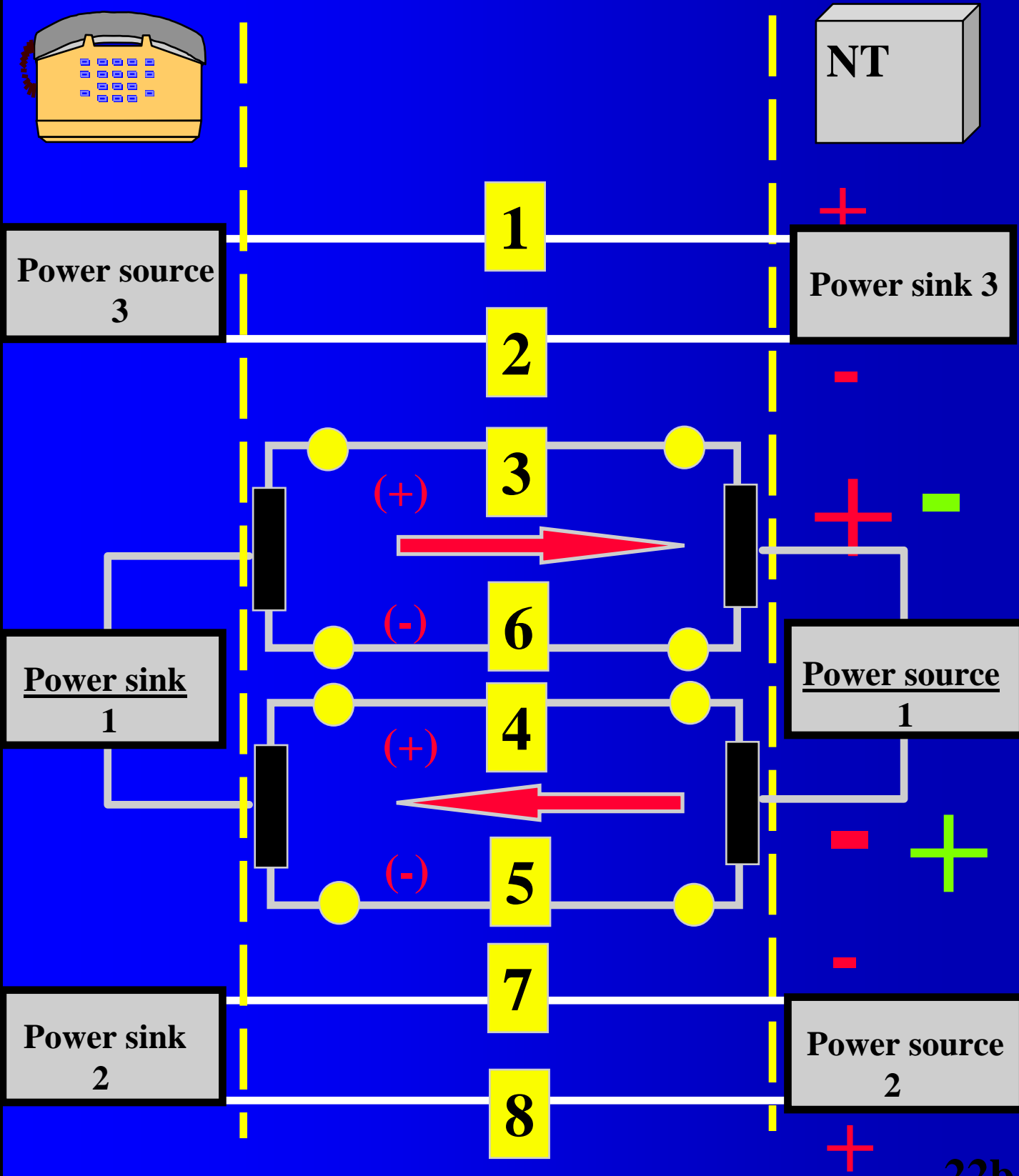
## S-bus strømforsyning





# Basic Rate Access (ISDN2)

## S-bus strømforsyning



# Basic Rate Access (ISDN2) S-bus

**NTP'et er fysisk placeret på NT'en i form af et 8 polet modulstik (ISO 8877)**



**Ønsker kunden mere end et stik, udføres S-bus installation af TDK eller anden installatør efter regning.**

# Basic Rate Access (ISDN2)

## S-bus typer



Kort passiv bus



Udvidet passiv bus



Punkt til punkt bus

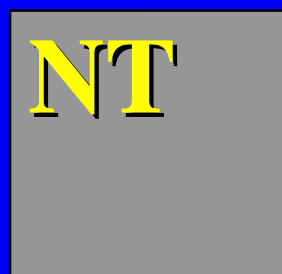
# Basic Rate Access (ISDN2)

## S-bus typer

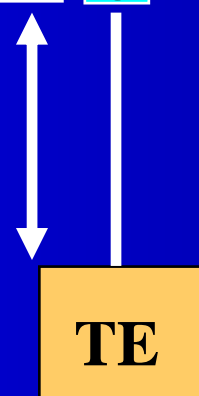


## Kort passiv bus

≤100 - 200 meter



Max. 10 meter



Max. 8 Terminaler  
dog op til 12 stik

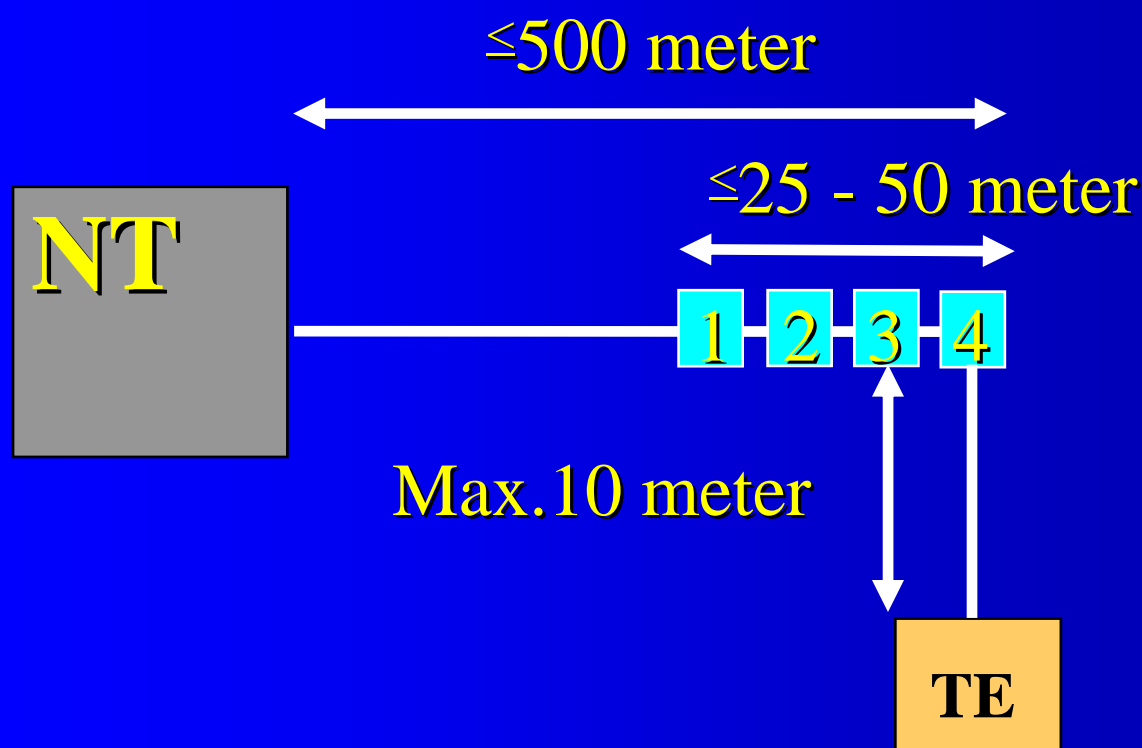
Fixed timing

# Basic Rate Access (ISDN2)

## S-bus typer



## Udvidet passiv bus



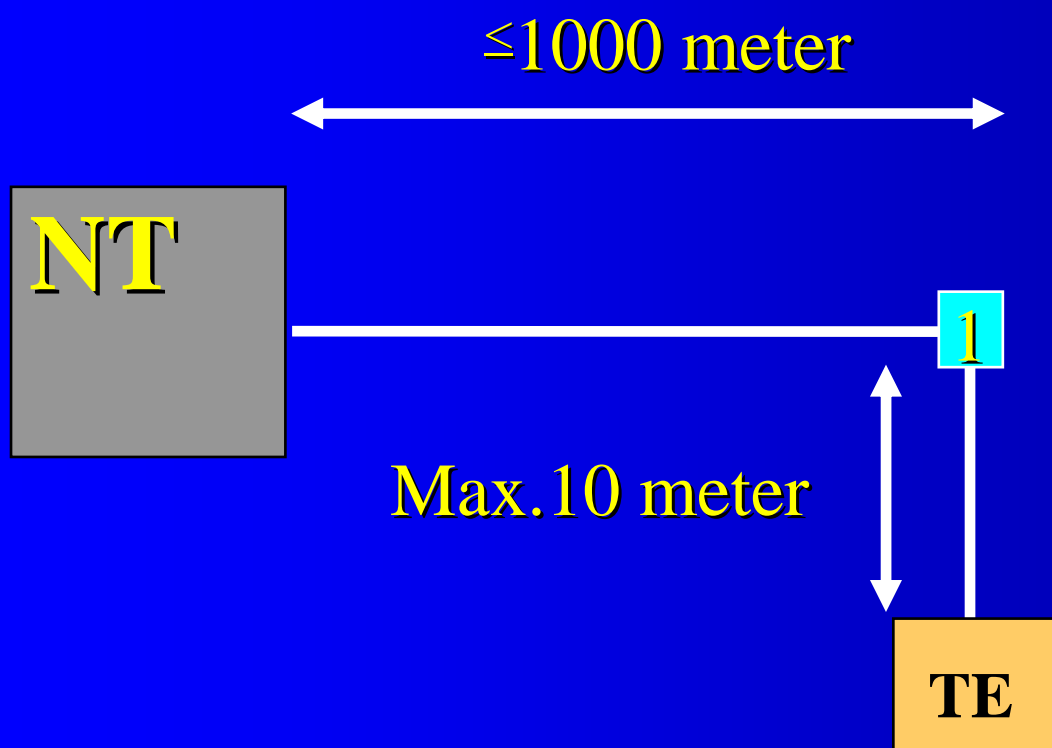
Max. 4 Terminaler

Adaptiv timing

# Basic Rate Access (ISDN2) S-bus typer



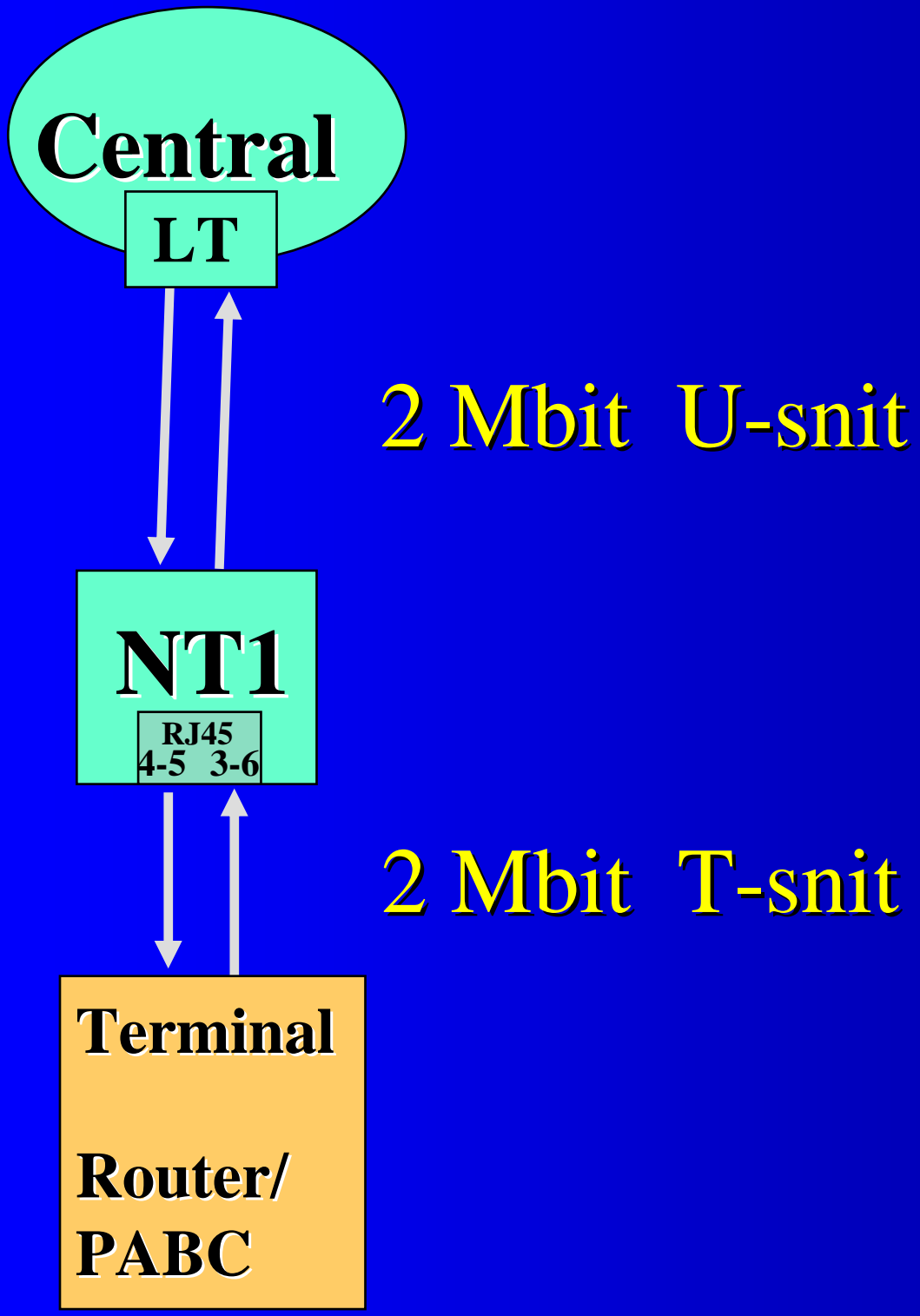
## Punkt til punkt bus



Max. 1 Terminal

Adaptiv timing

# Primary Rate Access (ISDN30)



# CASE

**Punkt til Multipunkt signalering**  
(Op til 8 terminaler)

**Basic Rate Access (ISDN2)**



