Roots of the net

Wie das Netz nach Deutschland kam

Technische Höhepunkte

in den 80er Jahren …

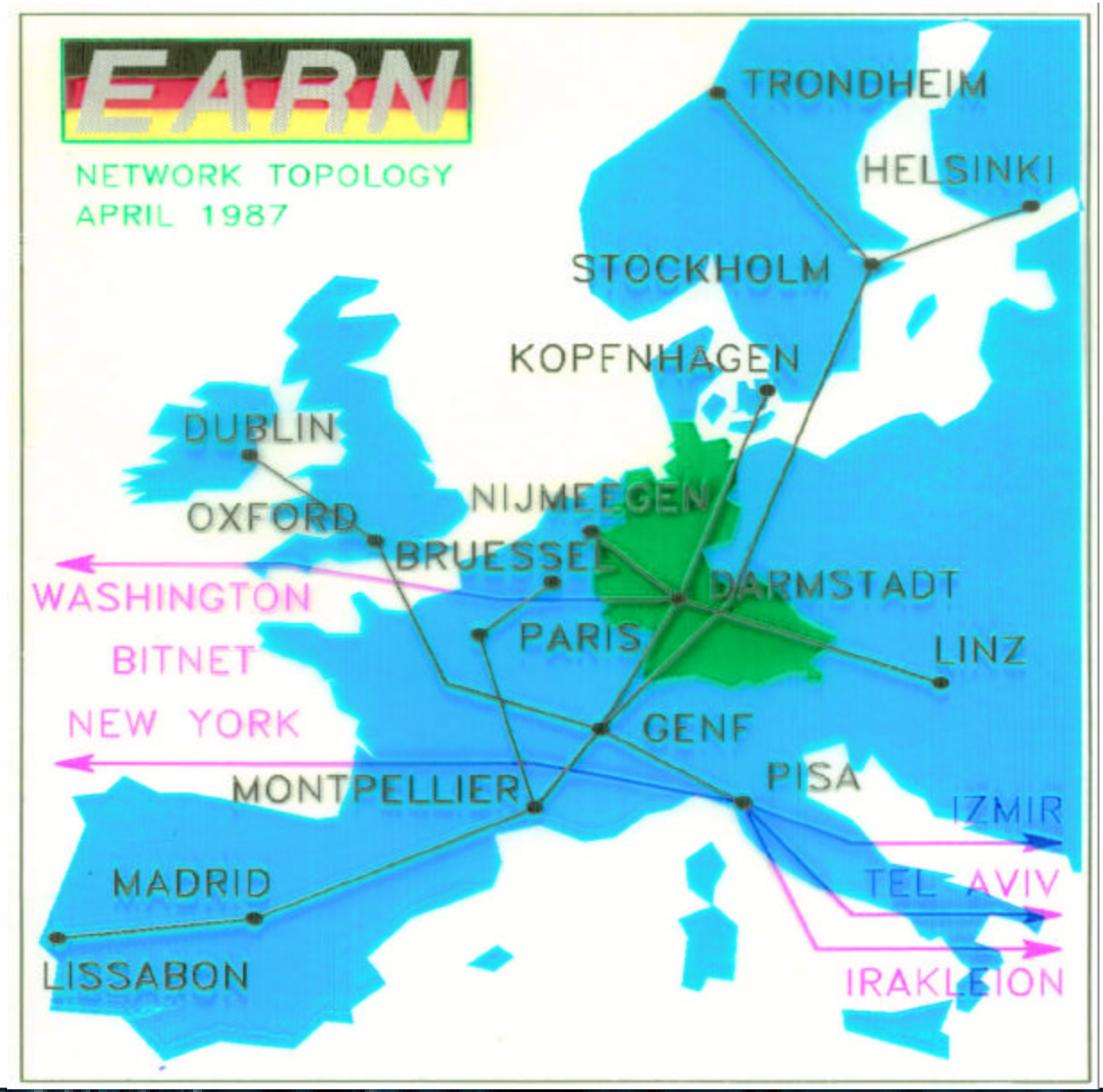
Die Computer der 80er Jahre

- **Mainframes mit Batch-Processing**
  - BSC/SNA, RJE
- **Minicomputer (Vax11, PDP11, RT, IBM PC, …)**
  - VT/100, V.24, Host-Emulation, Batch-Processing
- **Kommunikation**
  - Datex-P, Datex-L, EHKP4, T70

Die Computer der 80er Jahre …

- **Remote-Job-Entry**
  - JES2/JES3, HASP, RJE
- **Dialog**
  - 3270, VT/100
- **Protokolle**
  - NJE, RJE
- **JCL (Job Control Language)**
- **Zeichensätze (EBCDIC, ASCII)**

EARN

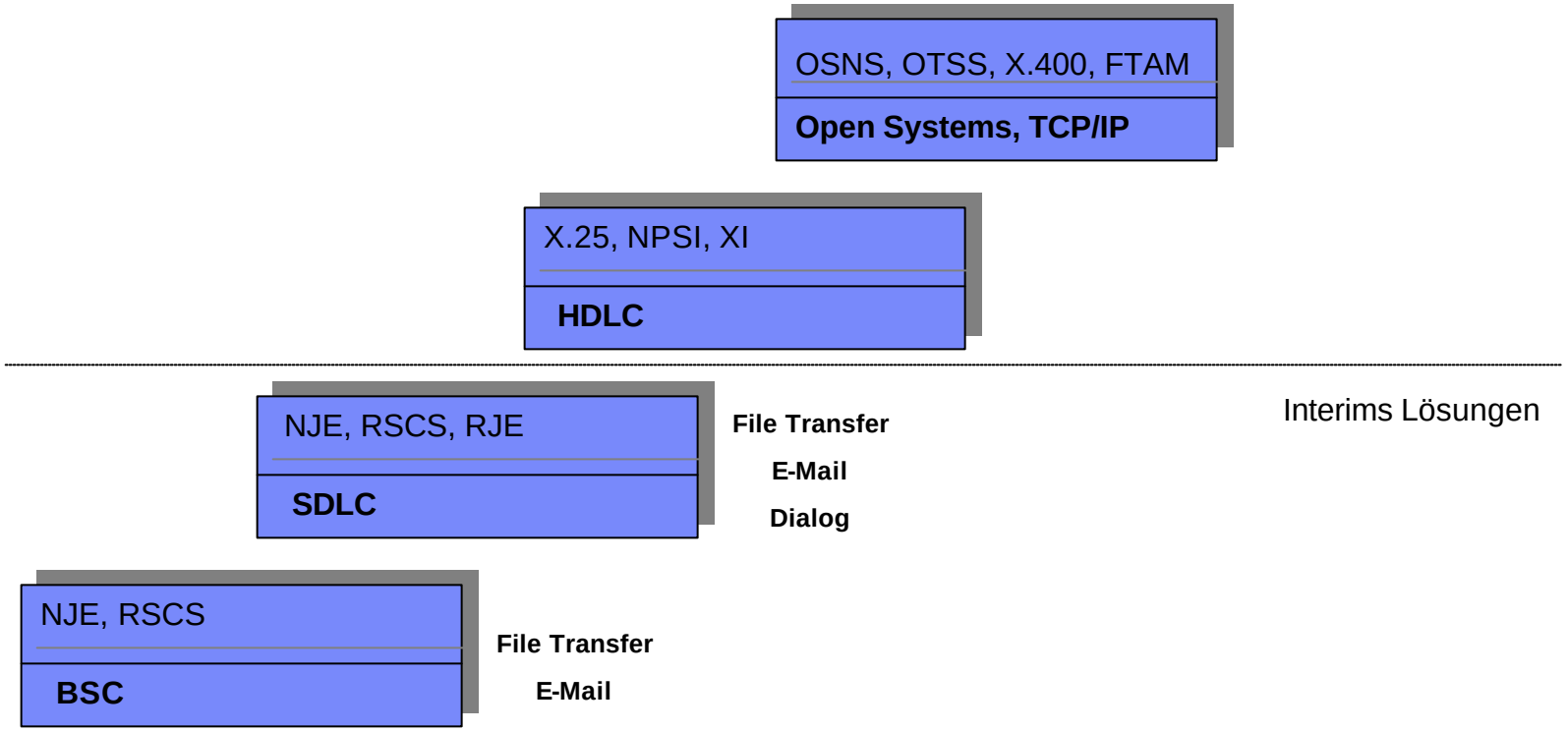


04/87

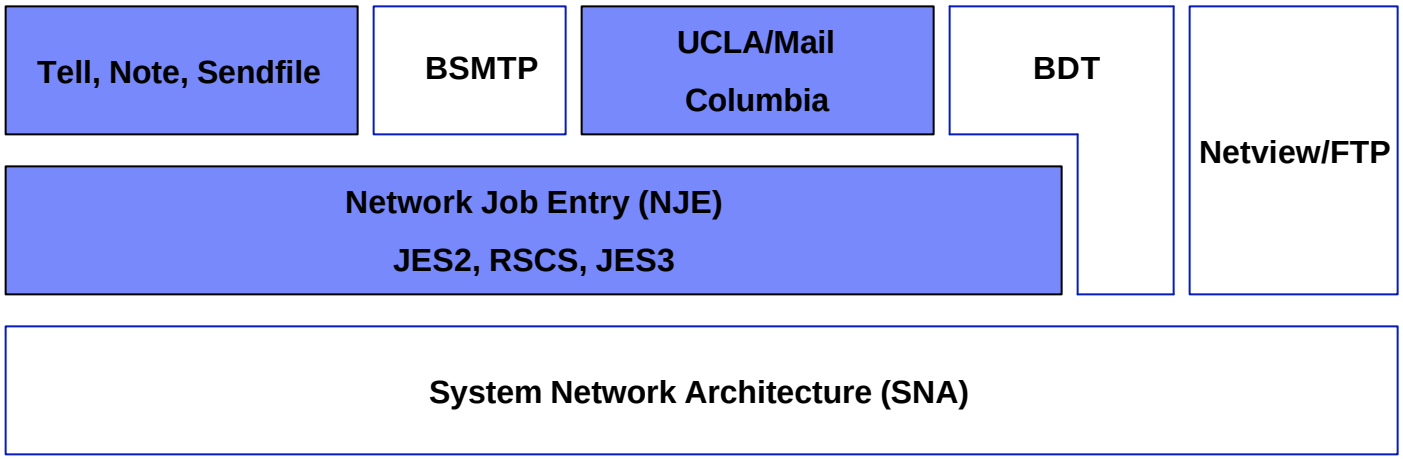
EARN/BITNET

- **European Academic Research Network (EARN)**
  - Because It's Time NETwork (BITNET) in den USA
- **Methodik**
  - Store-And-Forward und Control Messages
    - SMSG
    - Sendfile (Austausch von Dateien)
    - e-Mail
- **Protokolle**
  - NJE (RSCS), RJE

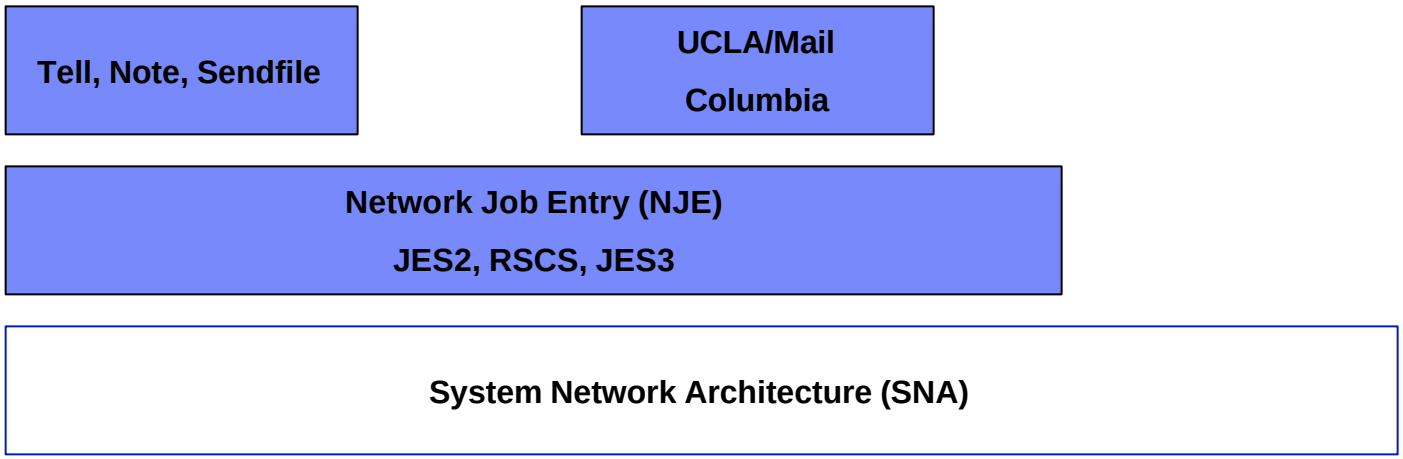
EARN/BITNET und das technologische Wachstum



“IBM Mainframe” Anwendungen



“Klassische” EARN/BITNET Anwendungen



EARN/BITNET

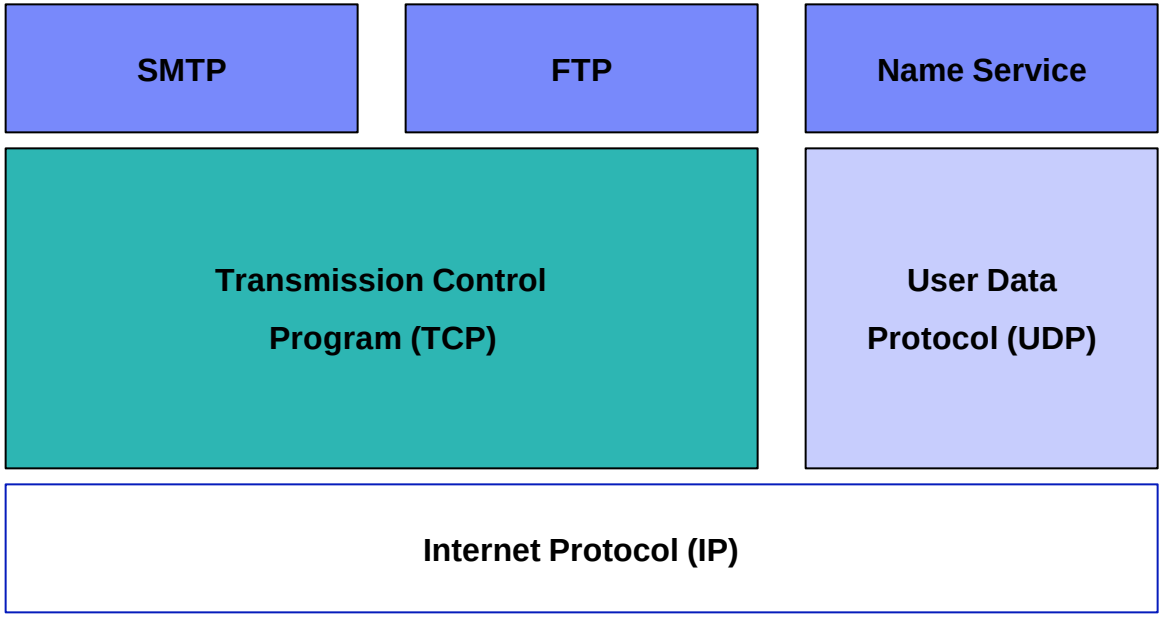
- **Netzwerkverwaltung**
  - weltweit genutztes BITNET (nodes file) Format
    - 8-character Userid/Nodeid
- **NETSERV**
- **LISTSERV**
- **GRAND**
- **X.500 Directory Services**
- **Zugang zu ftp-Servern**
  - RFC’s
  - Dokumentationen
- **Dialog mit Forschung, Entwicklung und Wissenschaft**

LAN/WAN

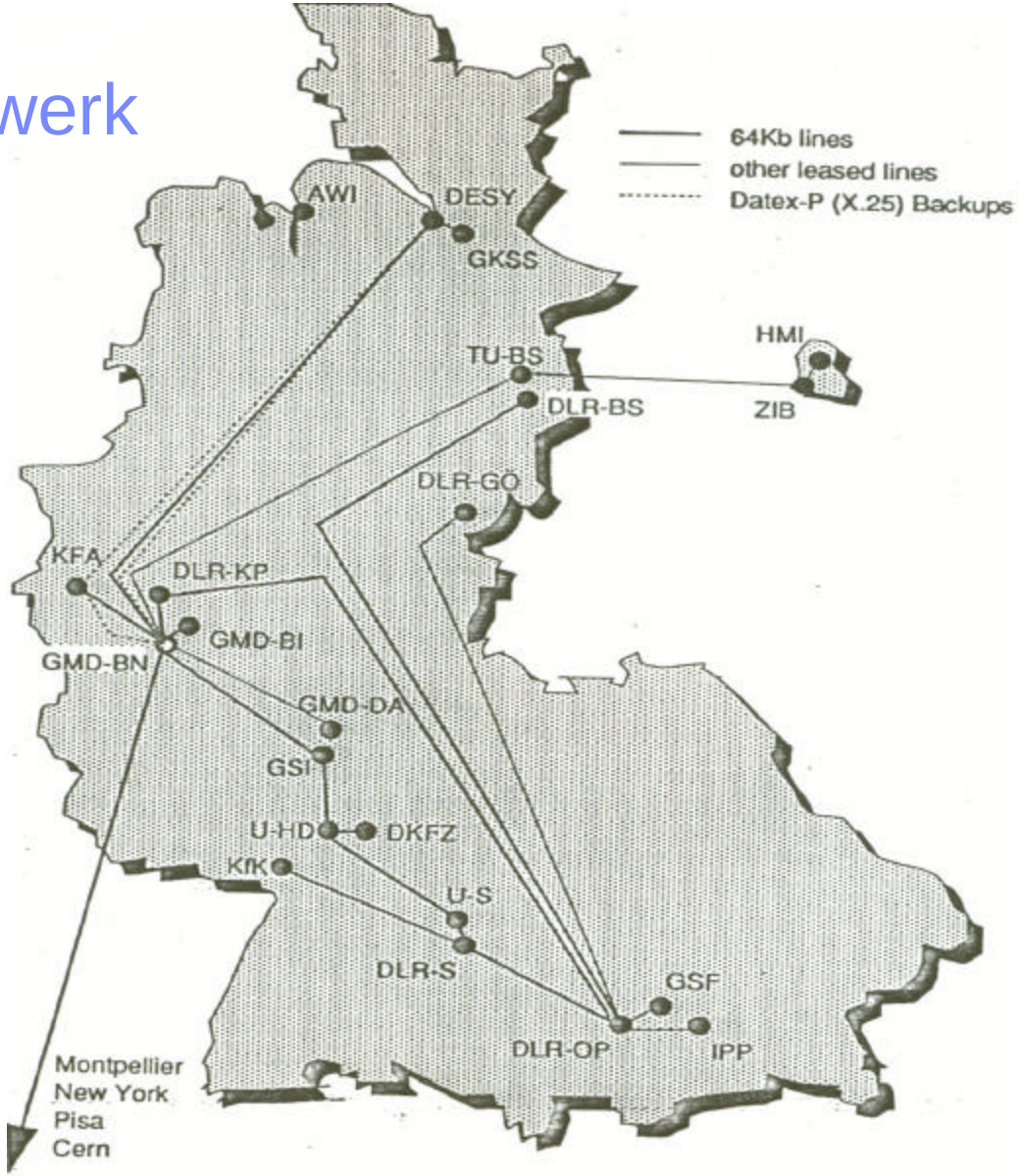
- **TCP/IP**
  - BSD Unix
- **X.25**
- **OSI**
  - 7-Schichten Modell

7	Anwendungsschicht
6	Darstellungsschicht
5	Sitzungsschicht
4	Transportschicht
3	Netzwerkschicht
2	Sicherungsschicht
1	Physikalische Schicht

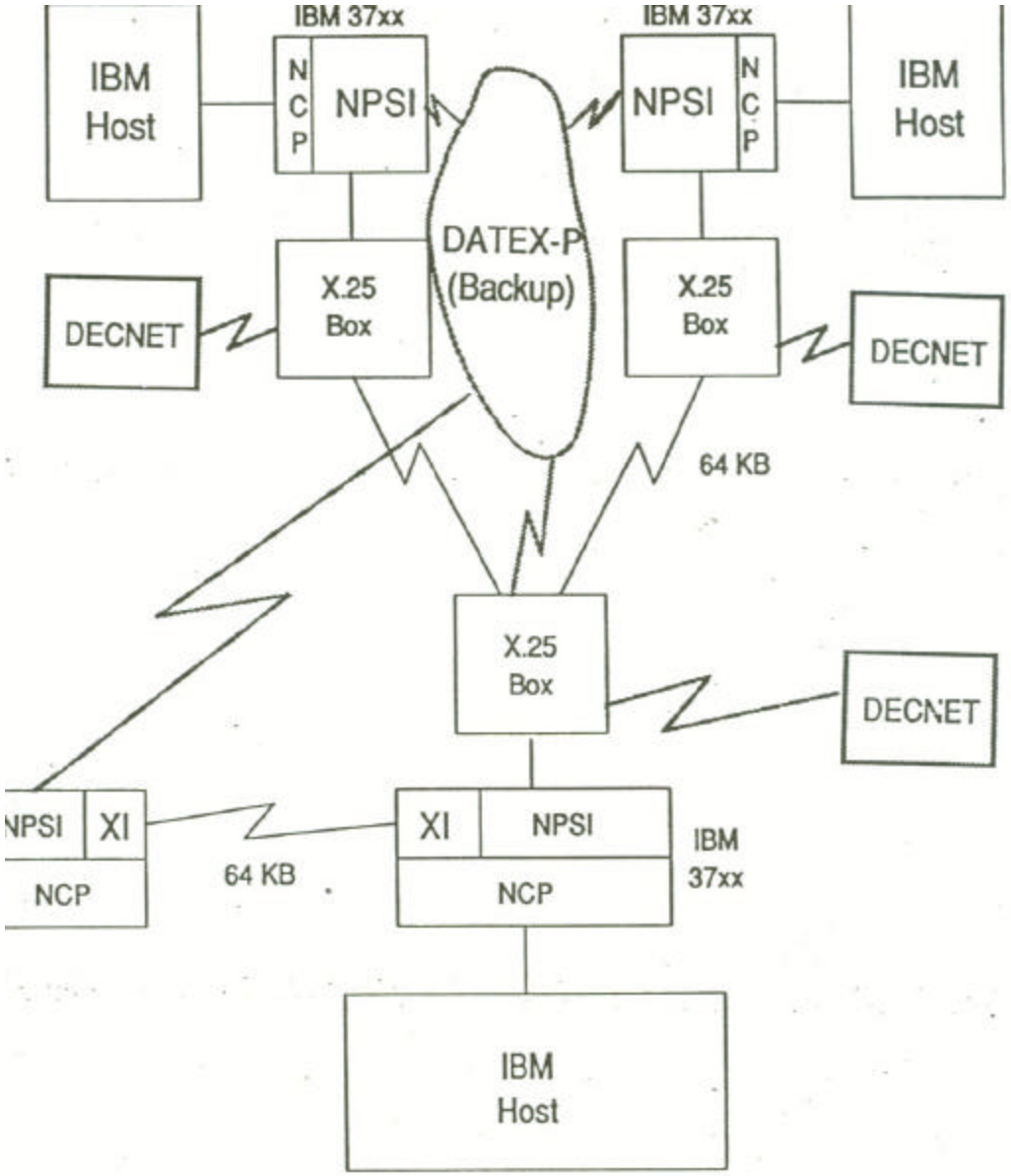
TCP/IP Anwendungen



AGF Netzwerk



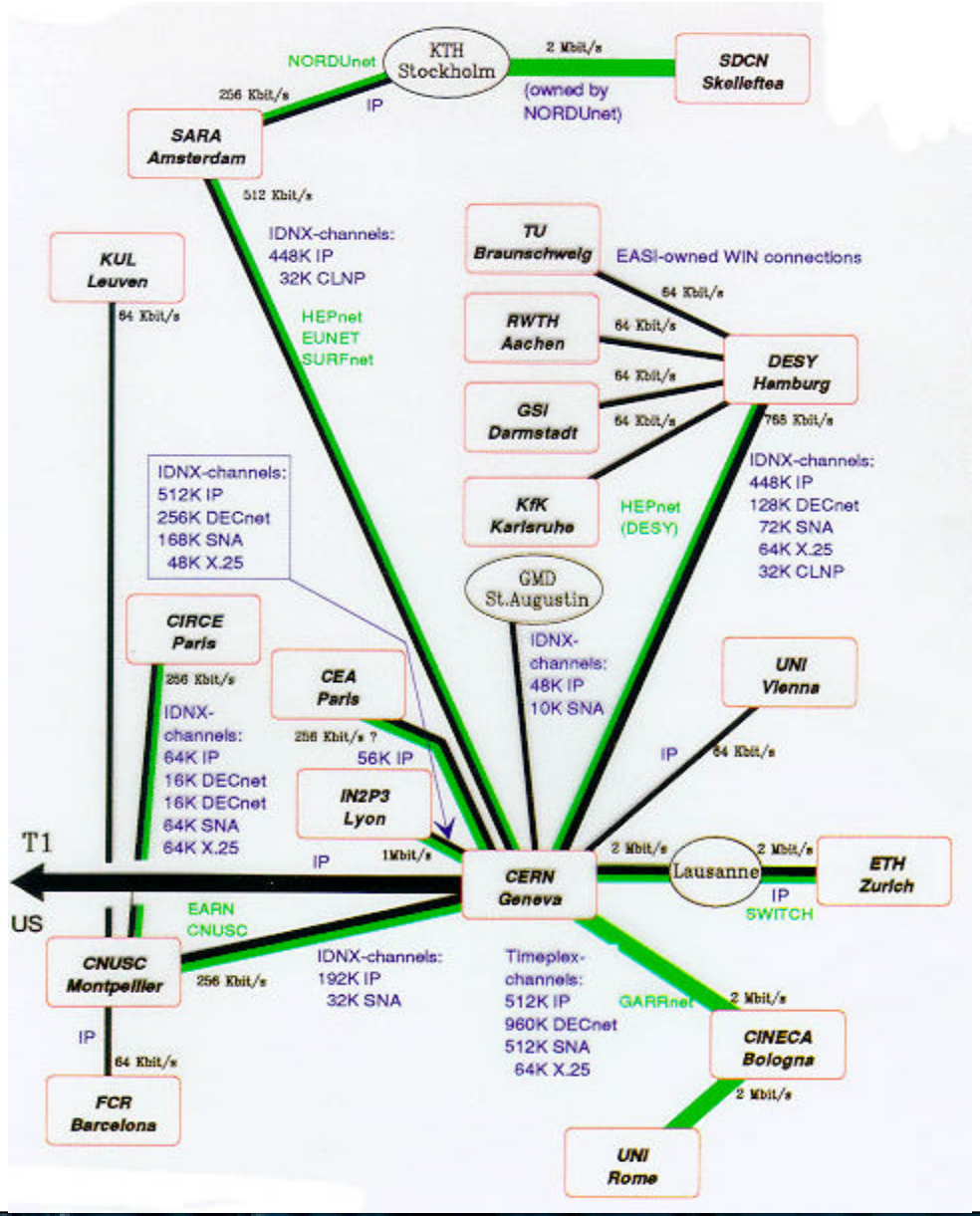
AGFnet



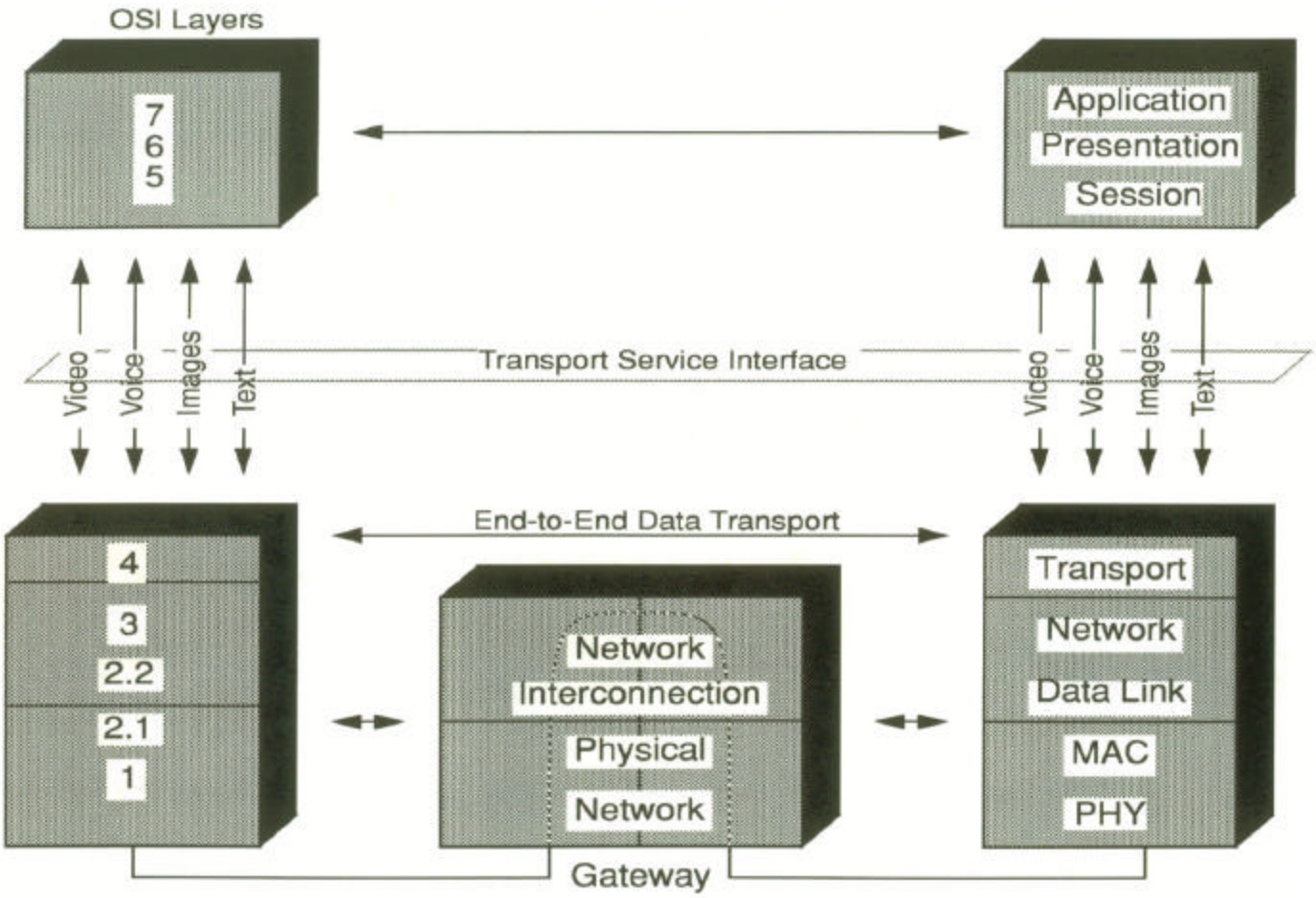
Struktur

EASInet

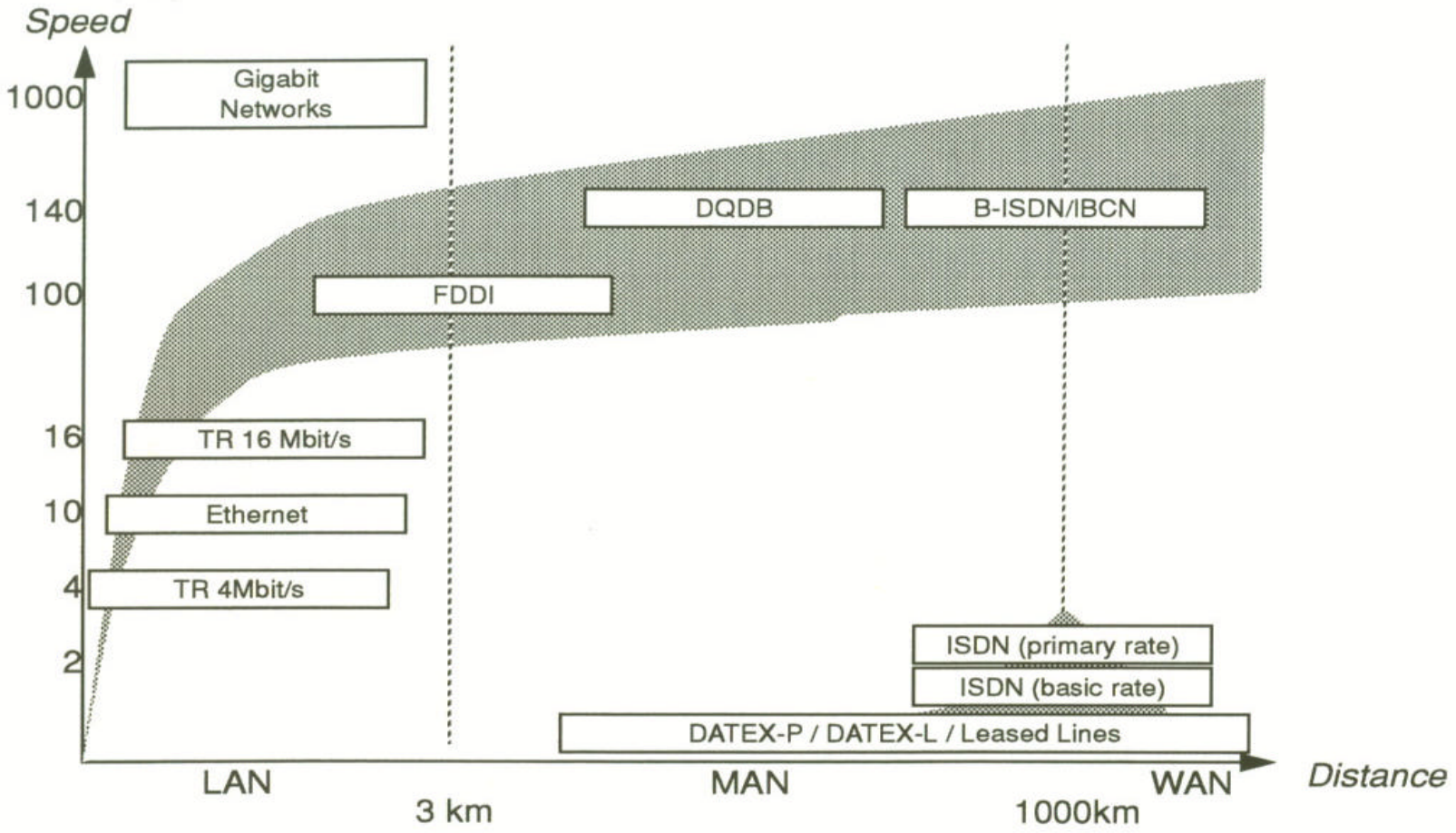
06/92



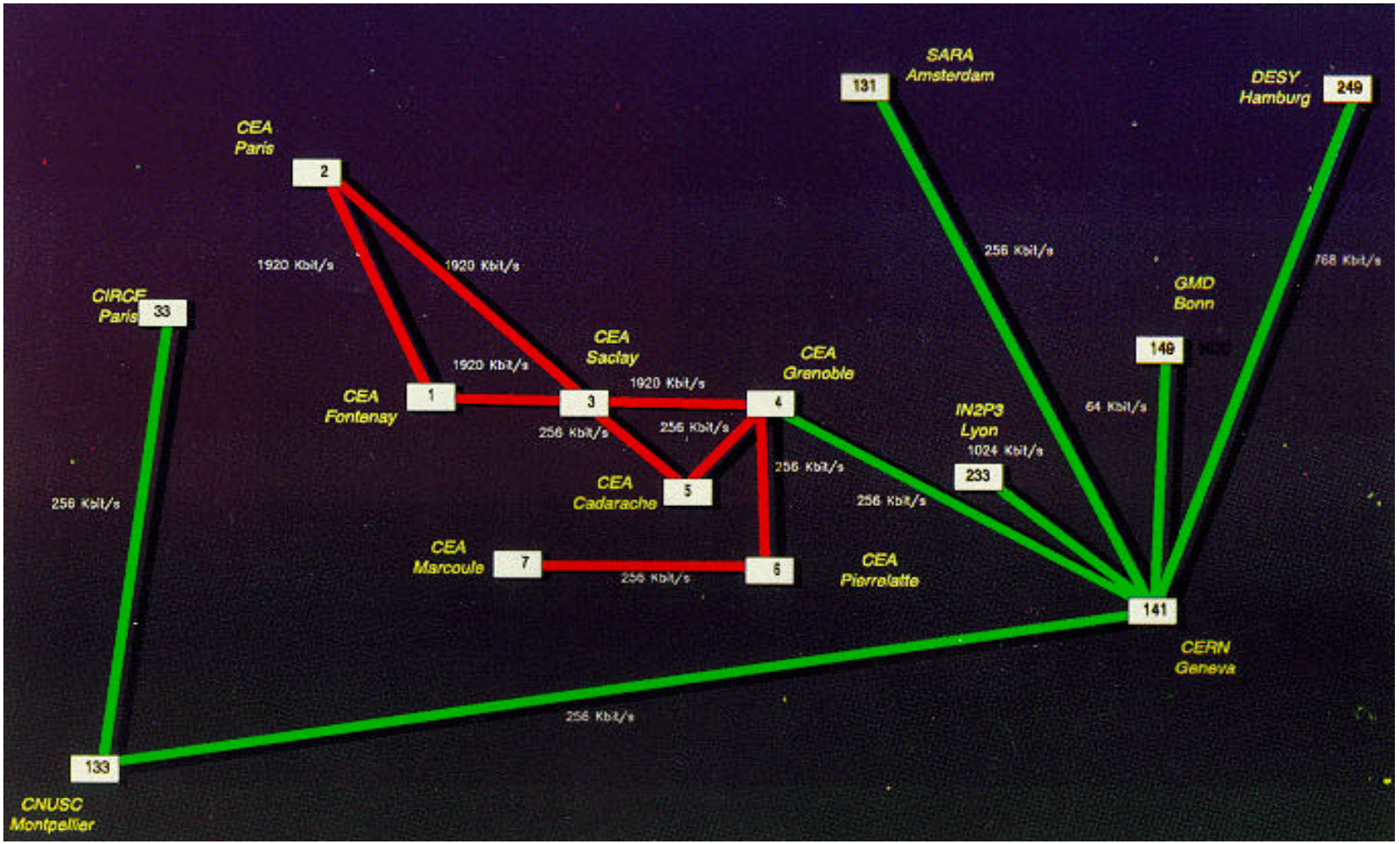
Architektur Referenz



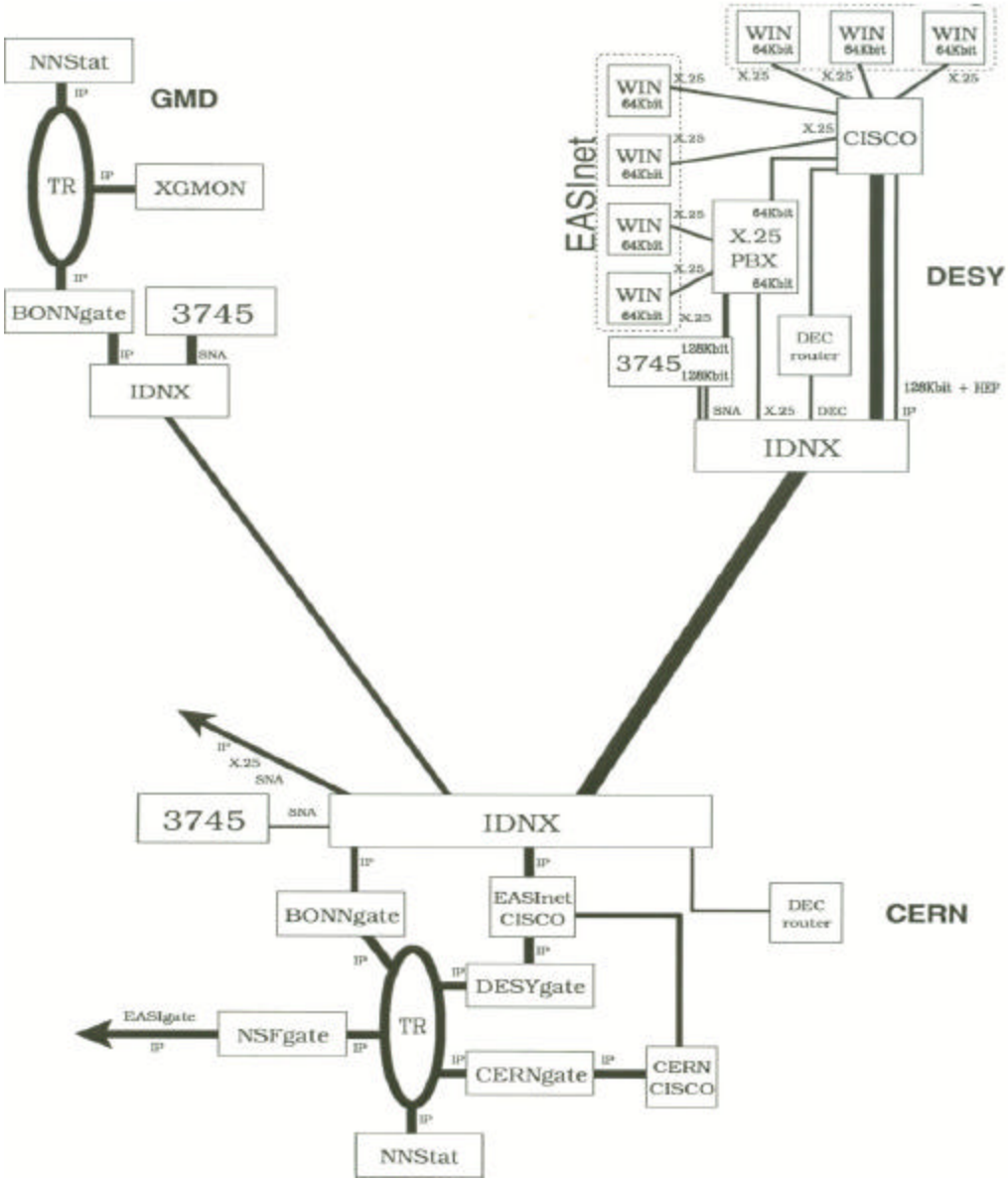
Netzwerk Trends



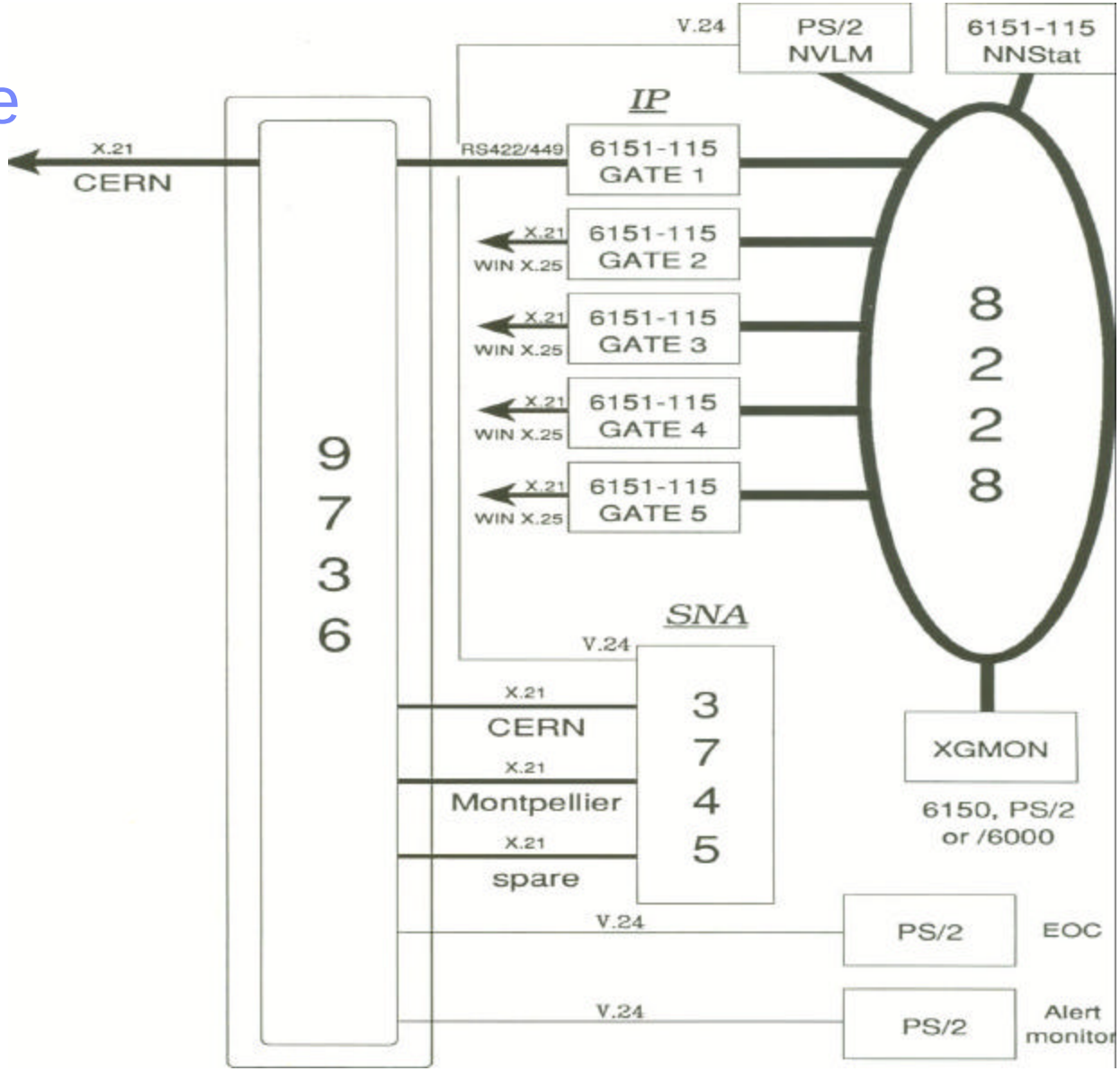
IDNX Backbone



WIN Anbindung

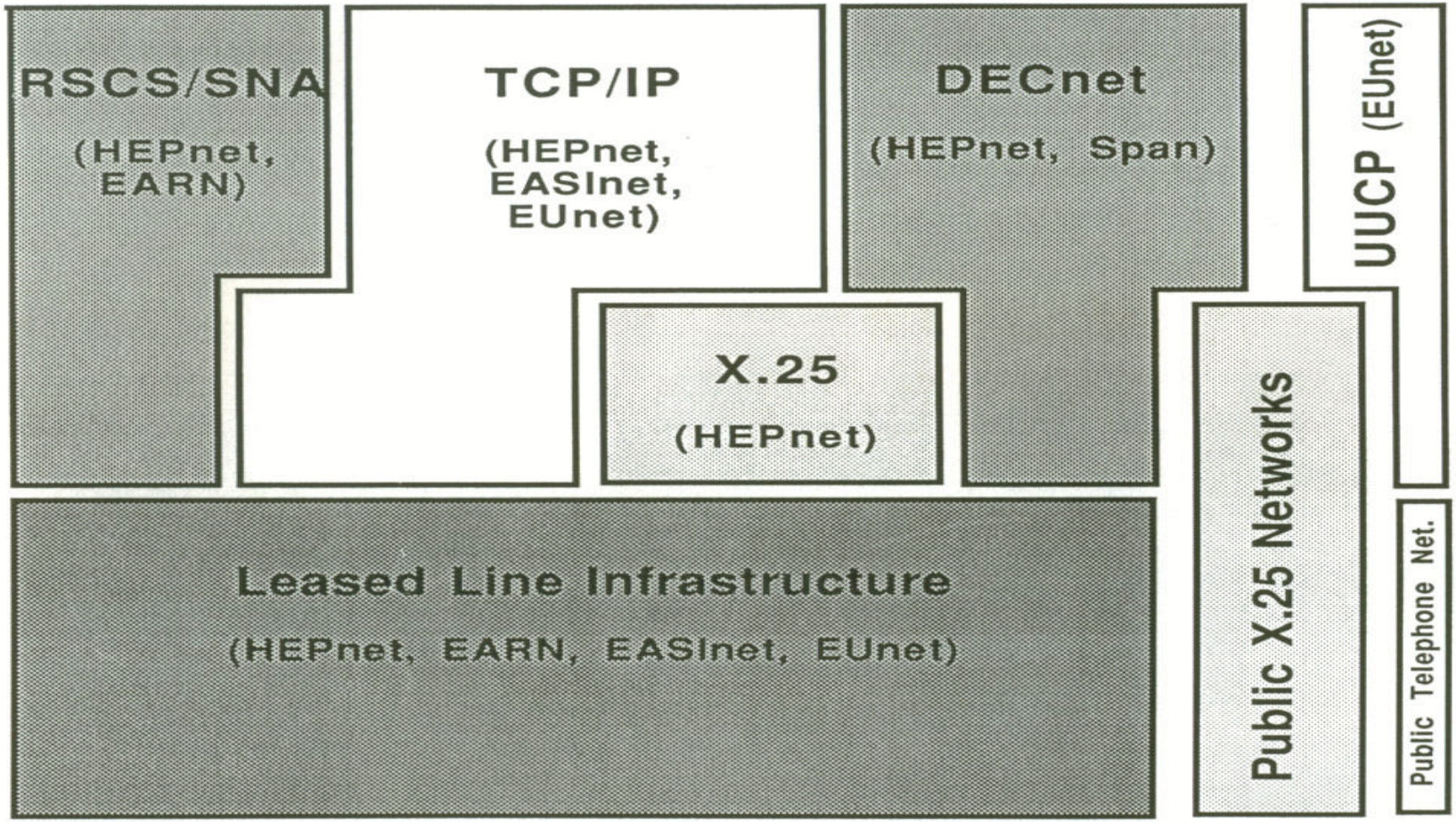


EASIgate

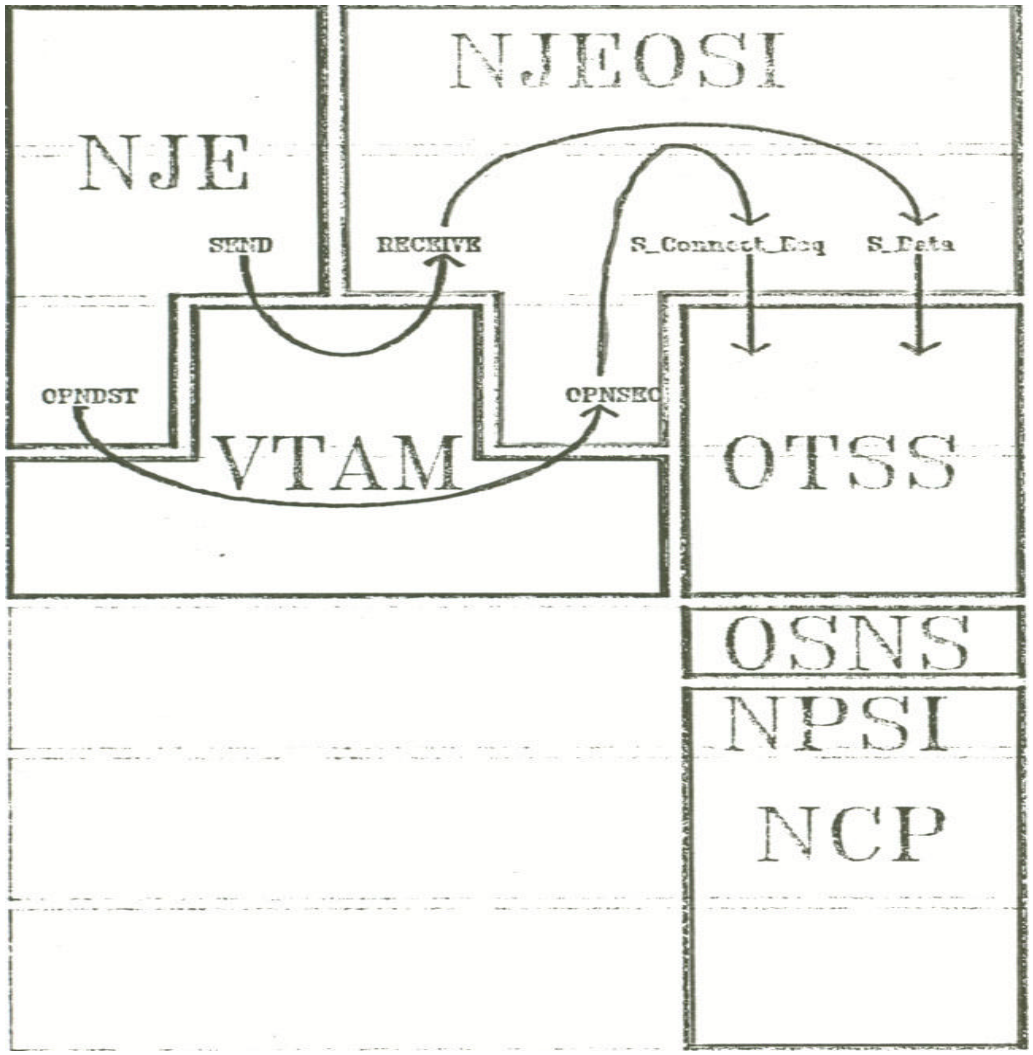


GMD

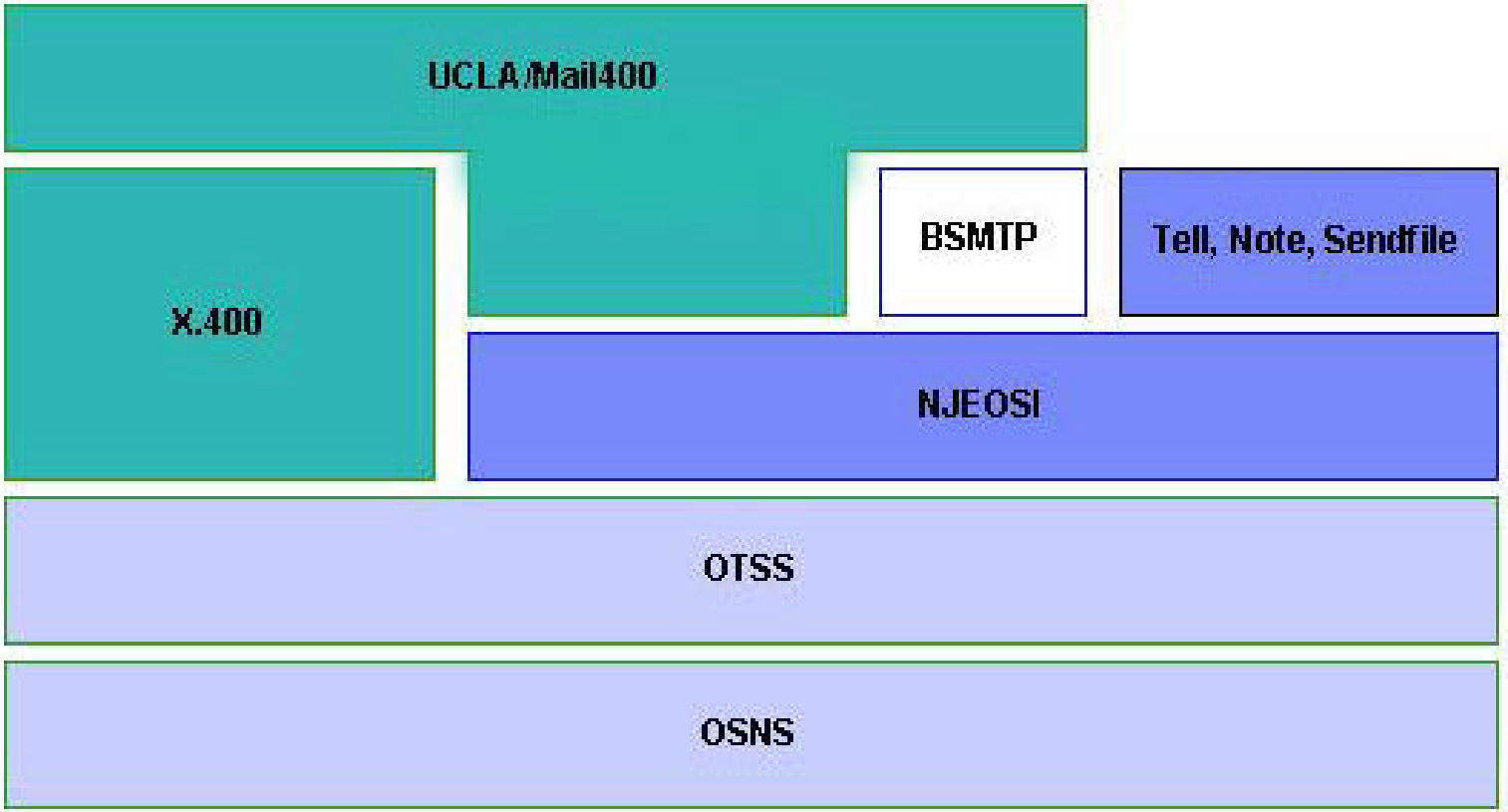
Protokolle



NJEOSI Gateway 1988



OSI Anwendungen

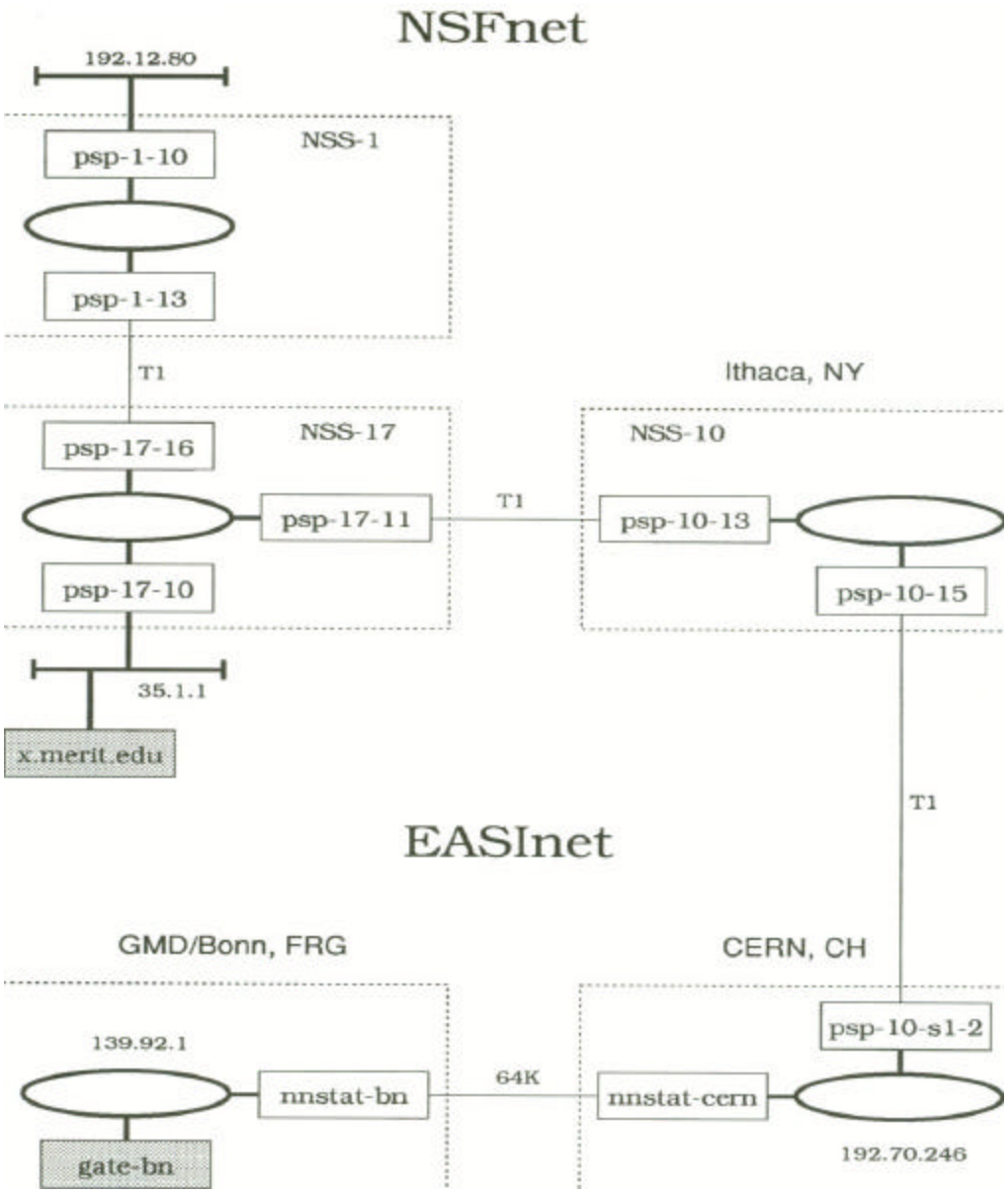


Anwendungen und Protokolle

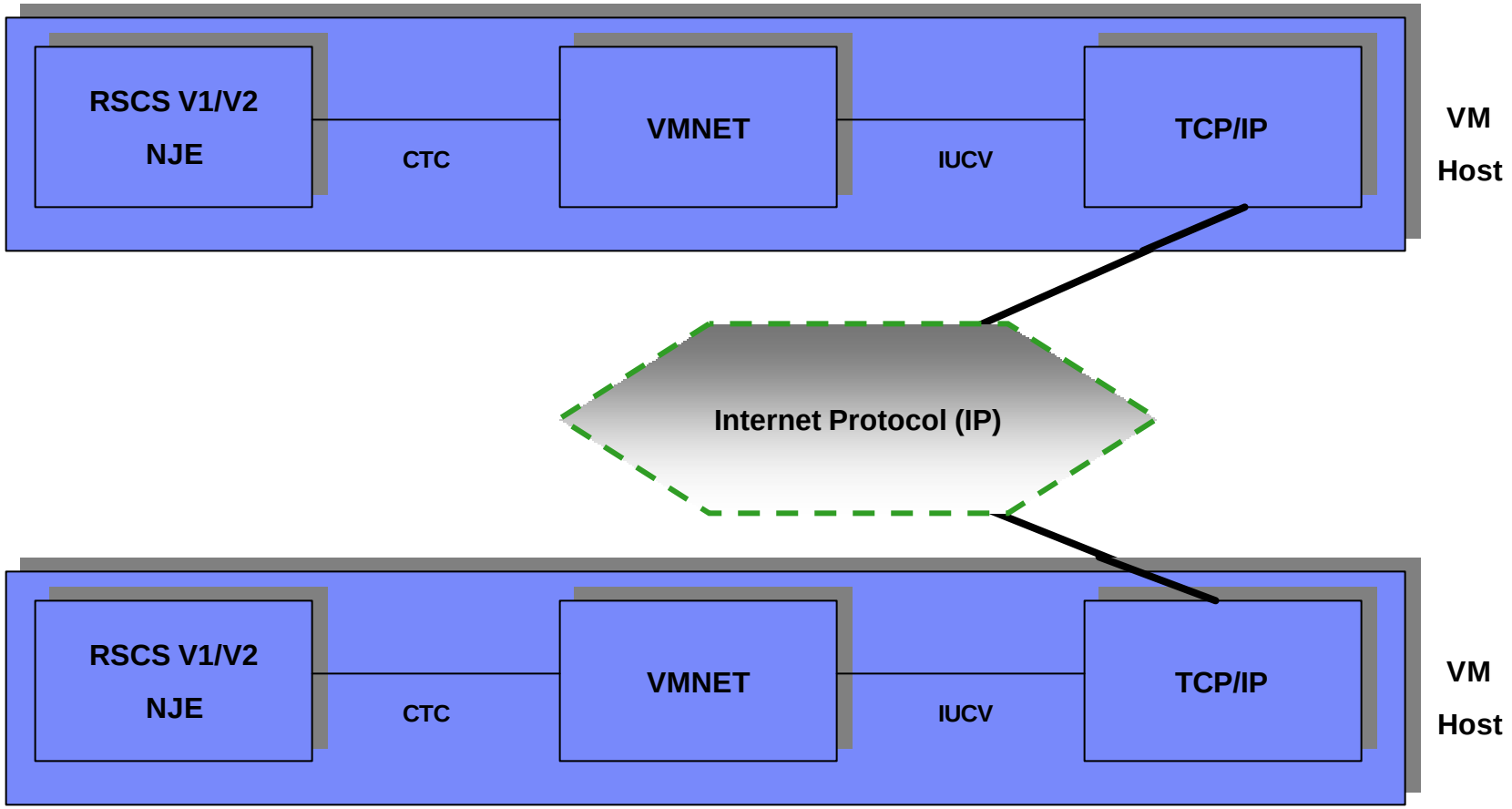
Applications	Protocol Stacks		
	S N A	**T C P / I P**	**I S O / O S I**
Mail	**BSMTP (NJE)**	**SMTP**	**X.400**
File Transfer	**NJE, BDT, Netview/FTP**	**FTP**	**FTAM**
Dialog	**3270**	**Telnet**	**Triple-X**
Directories	**NETSERV**		**X.500**

CLNP

Demo



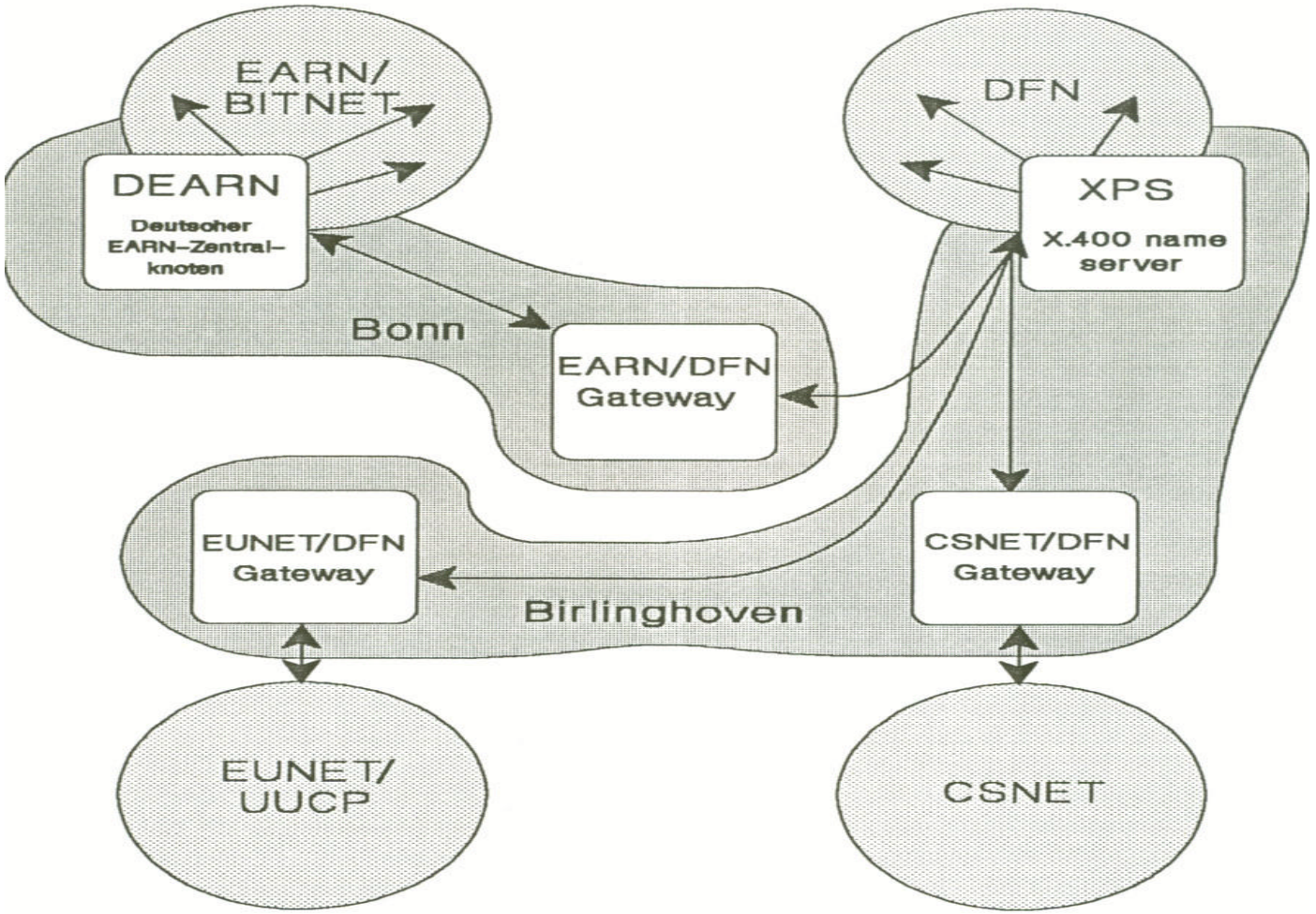
RSCS über TCP/IP



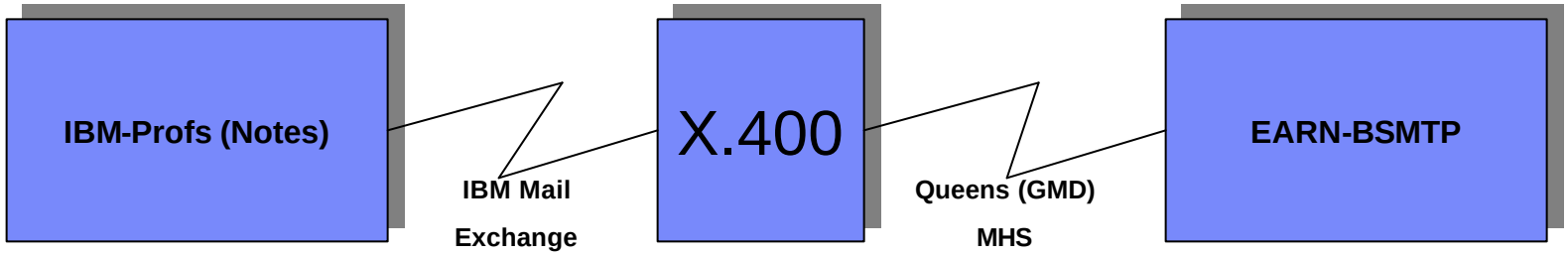
OSI-Protokolle des DFN (2. Generation)

7	MHS X.400	RJE	FTAM	VT
		Case (ISO 8649, ISO 8650)		
6	X.409	Presentation (ISO 8822, ISO 8825)		
5	Session (ISO 8326, ISO 8327)			
4	Transport (ISO 8072, ISO 8073)			
3	X.25 (ISO 8208)			
2	HDLC (ISO 7776)			
1	X.21 (ISO 4903)			

Gateways

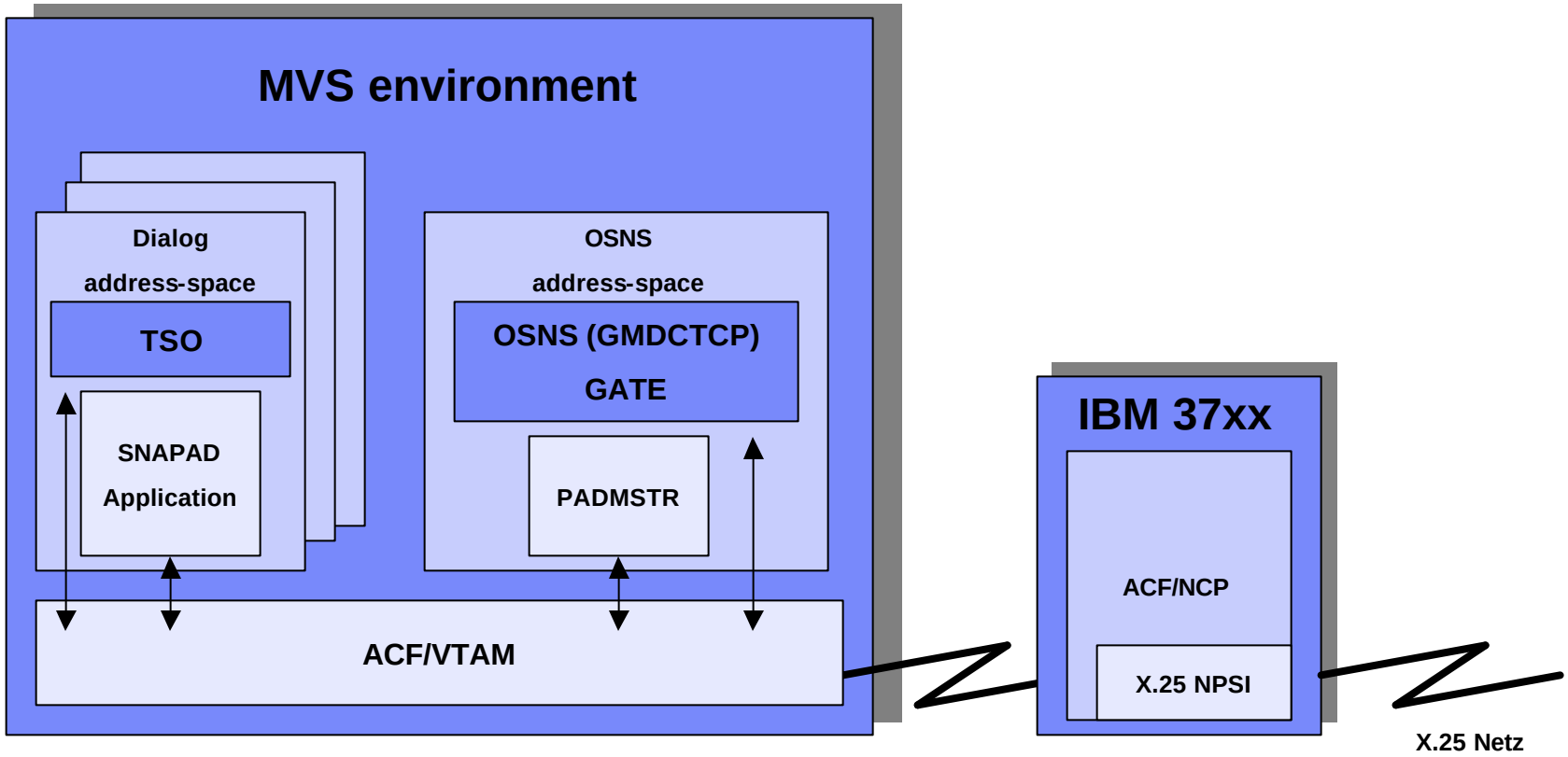


IBM Mail Exchange Gateway



- Physical connection via X.25
- IBM Mail Exchange Gateway was a worldwide e-mail exchange between IBM Profs and X.400

SNAPAD-Komponenten



- X.25 and X.29 Interfaces are used
- Line-oriented terminal (later full-screen) emulation via packet switched network

Der Verfasser: **Peter Streibelt**

- von 1984 – 1988 bei IBM zuständig für den Aufbau und Betrieb des “European Academic Research Network (EARN)”
- von 1989 – 1993 bei IBM als technischer Leiter des “European Academic Supercomputer Initiative Network (EASInet)”
- weitere Informationen unter: **www.caster.xhost.de**
- e-Mail: caster@skarabaeus.de