

# Towards networked digital production: the WDR RegioNet project

**EBU Networks 2005**

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About WDR

Project Goals

Technical Approach

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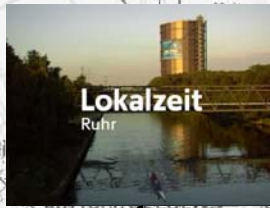


## About WDR

- **18 million inhabitants** in North Rhine Westphalia
- **5 Radio Programs**
- **1 TV Program with 9 regions**
- About 25% of **nationwide ARD TV program**



## Programmverbreitung



- Studio
- Office
- Production area
- DVB-Multiplex



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# Goals

- All Services Network
  - **contribution** (TV & Radio)
  - analogue and digital **distribution**
  - **Data and Telephony**
- Higher **capacity** for less money
  - cover demand even at exceptional events, e.g. elections
- High **scalability**
  - Migration from linear to non linear production technique



## Project History

- **May 2002 to Dec 2002:** Concept finding by a project group
- **Jan 2003 to Jun 2003:** preparing a tendering process
- **Jun 2003 to Nov 2003:** selection of the contract partner
- **Jan 2004 to Jun 04:** construction of the core ring (1<sup>st</sup> step)
- **Jul 04 to Nov 04:** completion

# Regionet Services

Service	Interface
Video Link On Demand	DSC270
Point to Multipoint	DSC270
Video Link	DSC270
DVB Distribution	DVB-ASI
Audio Contribution	E1
FM Distribution	E1
LAN Coupling	GbE/FastEtx
Telephony	E1



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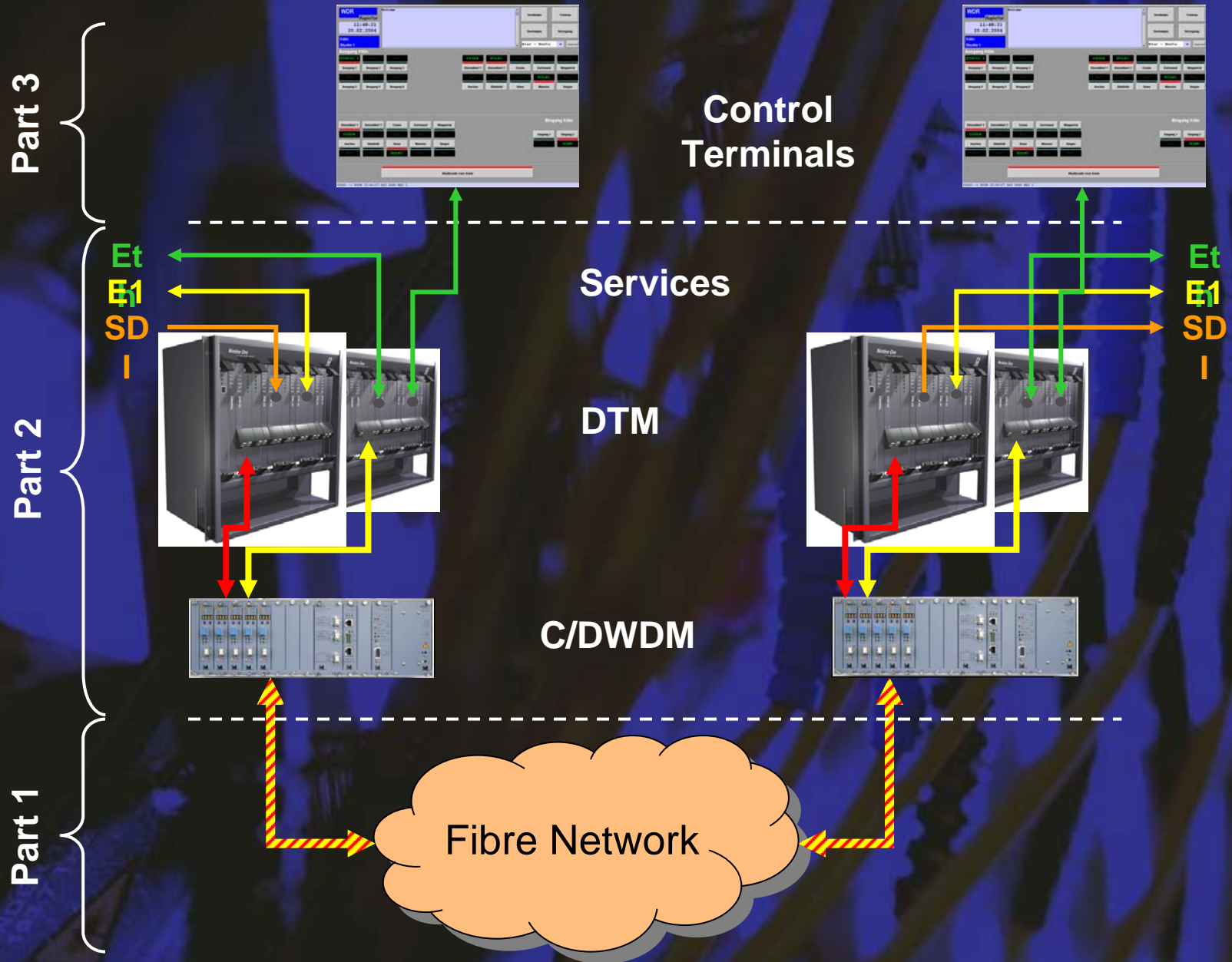
Project Goals

Technical Approach

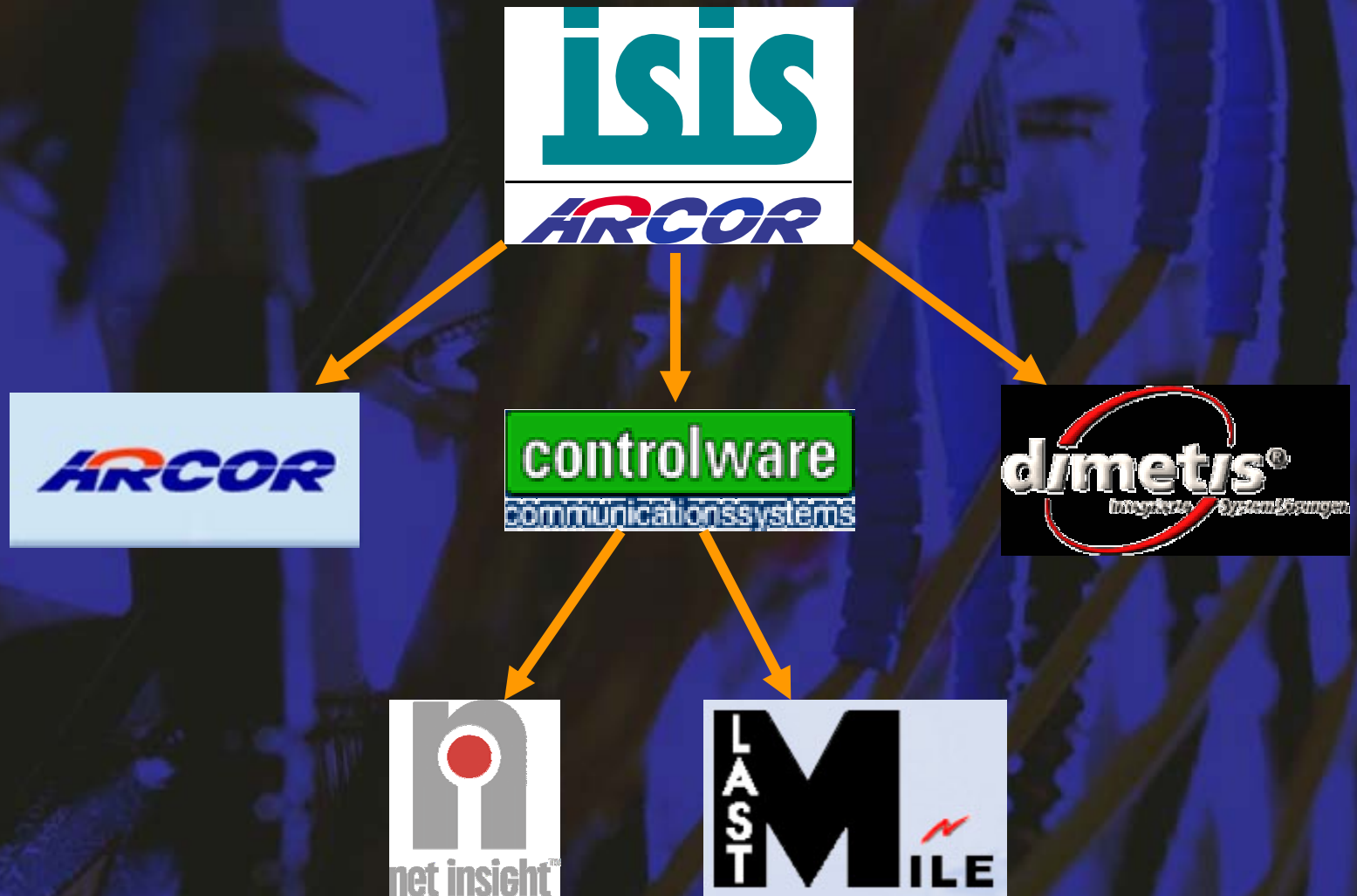
Conclusions



### Program Distribution

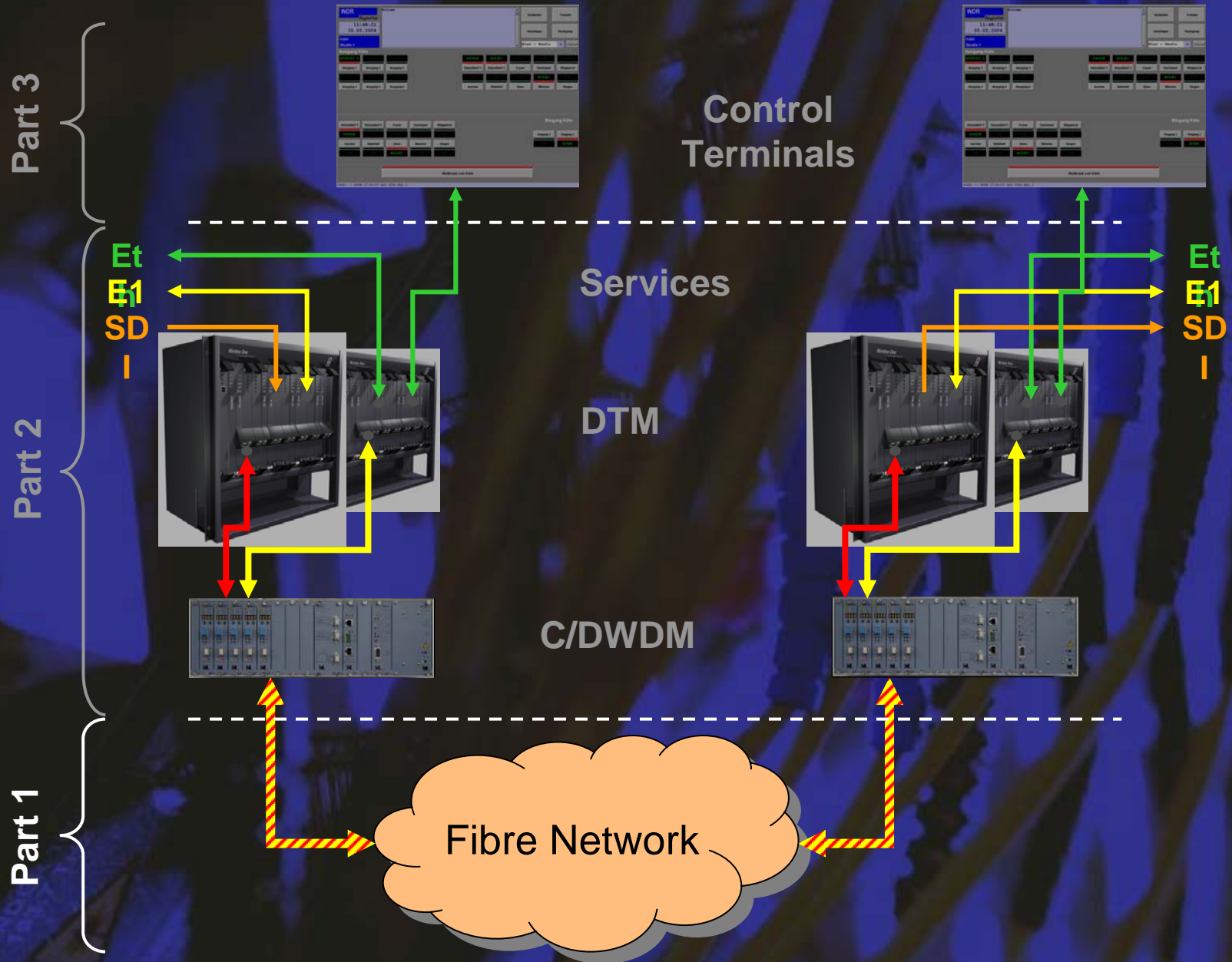


## Involved Companies

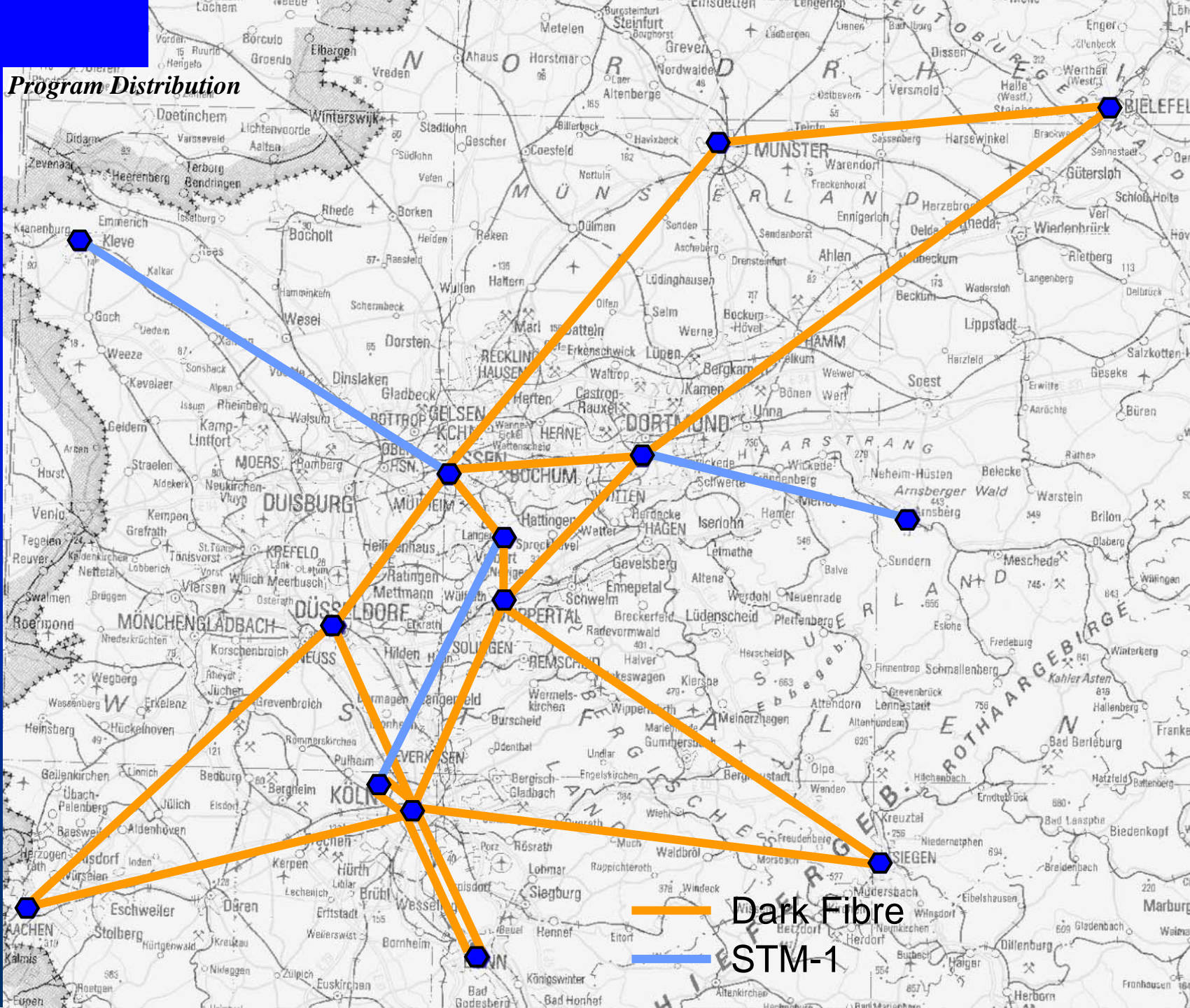




### Program Distribution

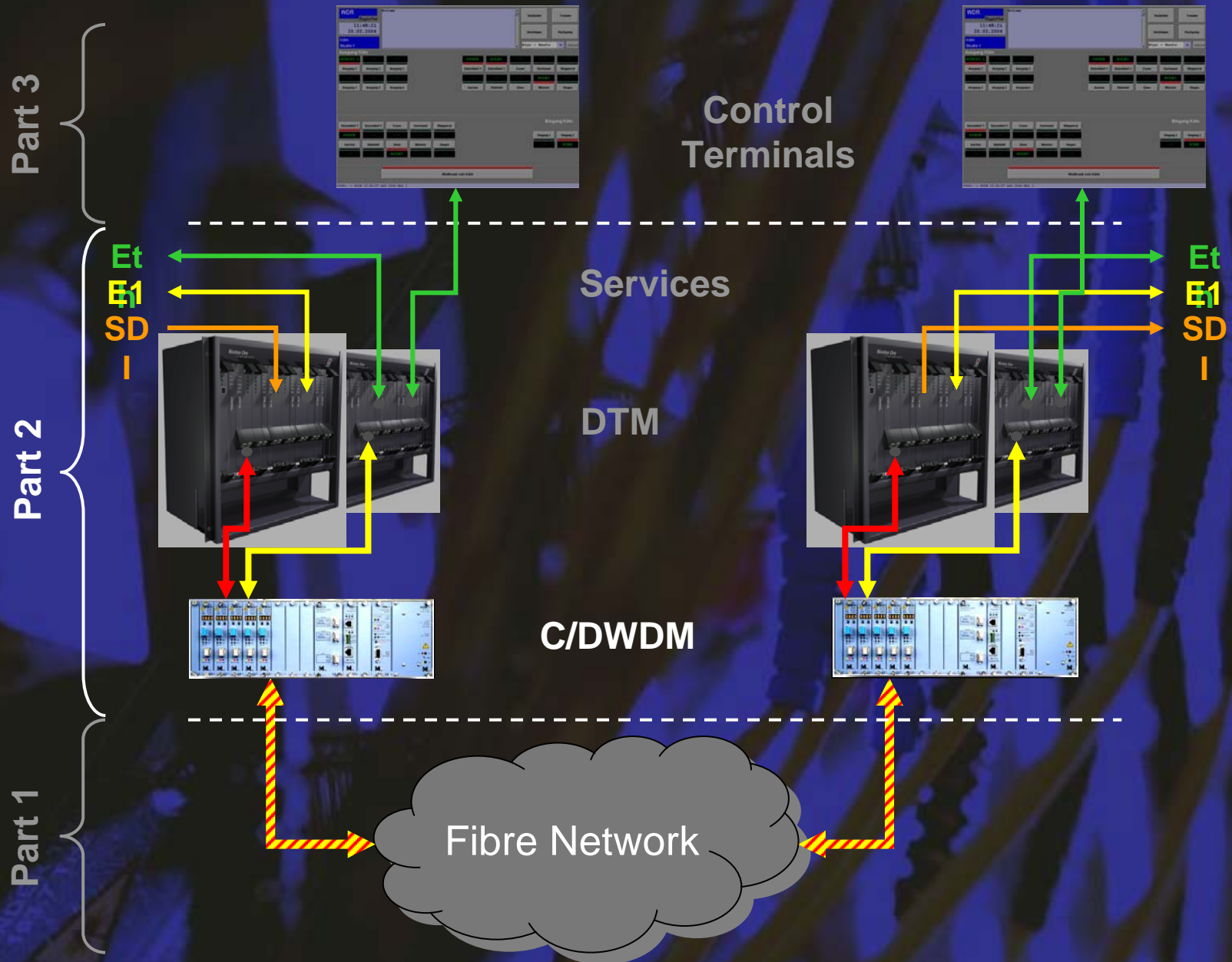


## Program Distribution





### Program Distribution

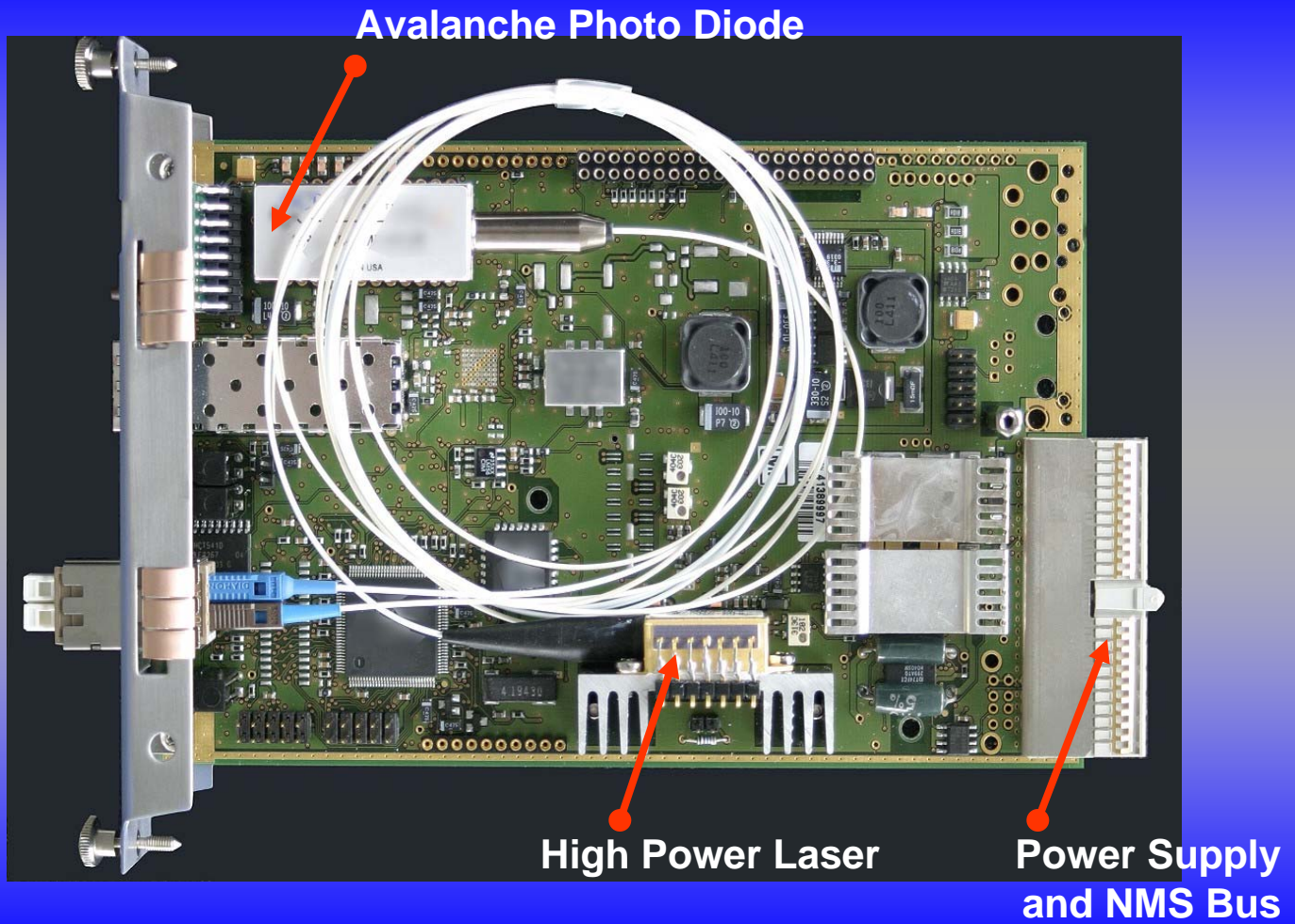




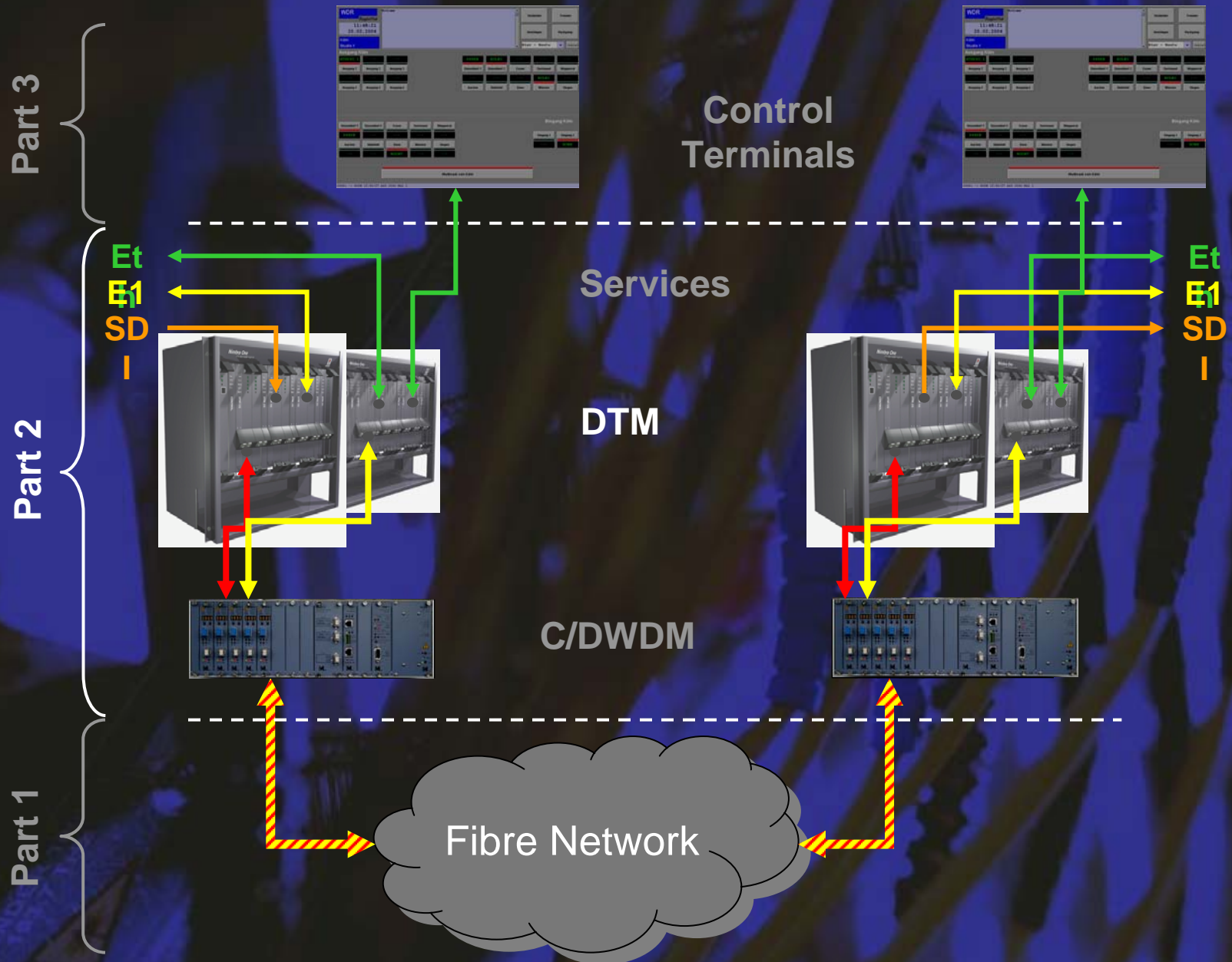
## Optical Filter und Transponder



## DWDM Channel Module WCM-2F



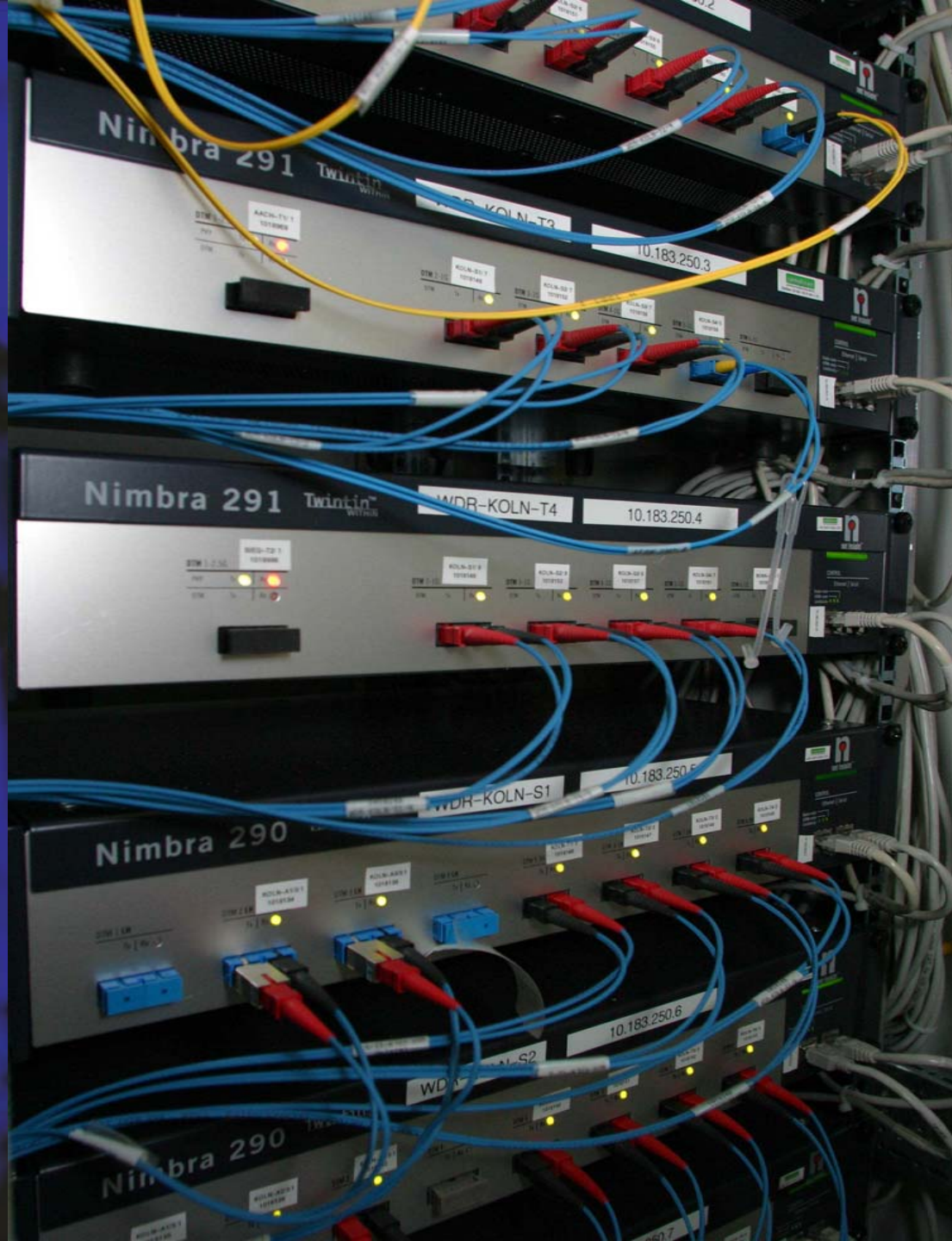
### Program Distribution





# WDR

## *Program Distribution*

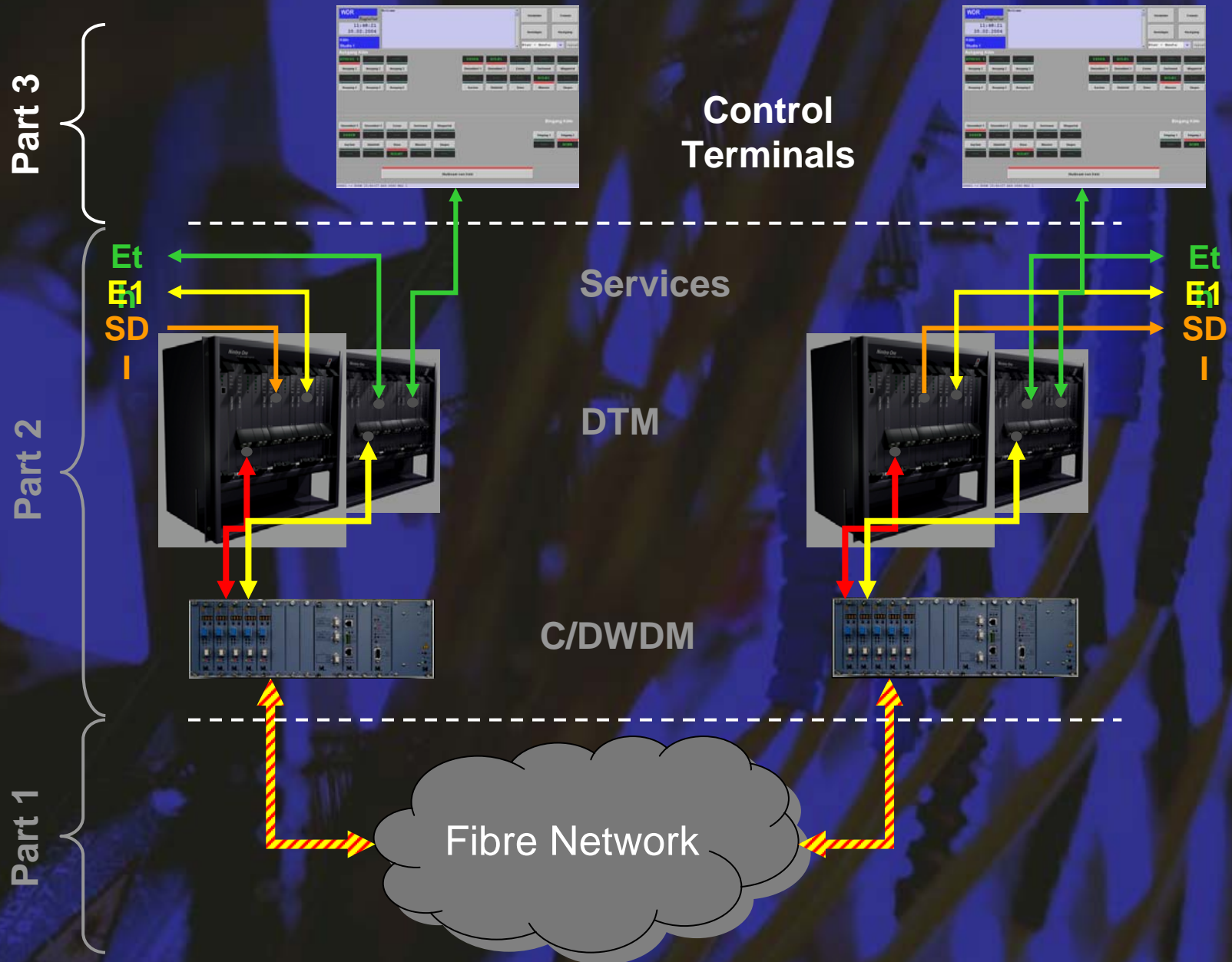


## DTM as Convergence Layer





### Program Distribution



28.05.	11:36	Status von ESSE-A1 beim Neustart: N [Simu.=J]
28.05.	11:36	Status von ESSE-A2 beim Neustart: N [Simu.=J]
28.05.	11:36	Status von KOLN-A1 beim Neustart: N [Simu.=J]
28.05.	11:36	Status von KOLN-A2 beim Neustart: N [Simu.=J]
28.05.	11:36	Status von KOLN-A3 beim Neustart: N [Simu.=J]
28.05.	11:36	Status von KOLN-A4 beim Neustart: N [Simu.=J]
28.05.	11:36	Status von KOLN-A5 beim Neustart: N [Simu.=J]
28.05.	11:36	Status von WUPP-A1 beim Neustart: N [Simu.=J]
28.05.	11:36	Status von WUPP-A2 beim Neustart: N [Simu.=J]

Verbinden    Trennen  
 Bestätigen    Rückgängig

**Ausgang Düsseldorf**

**Studio 1**    **MCAST**  
 Ausgang 1    Ausgang 2

<b>DSSD 2</b>	---	<b>DSSD 1</b>	<b>ESSN</b>	---	<b>DSSD 2</b>
Köln 1	Köln 2	Köln 3	Düsseldorf 1	Düsseldorf 2	Dortmund
---	<b>AACH</b>	---	<b>MSTR</b>	---	---
Aachen	Bielefeld	Bonn	Münster	Wuppertal	Siegen

**Eingang Düsseldorf**

Köln 1	Köln 2	Köln 3	Köln 4	Köln 5	Köln 6	Köln 7	
---	---	---	---	---	---	---	
Essen	Dortmund	Wuppertal	Aachen	Münster	Bielefeld	Siegen	Bonn
<b>DSSD 1</b>	<b>ESSN</b>	---	<b>BLFD</b>	<b>MSTR</b>	---	---	---

Eingang 1    Eingang 2  
**ESSN**    ---

**Westfalenschiene aus Dortmund**





## Program Distribution



12:06:26

17.09.2004

Chicago  
Sales

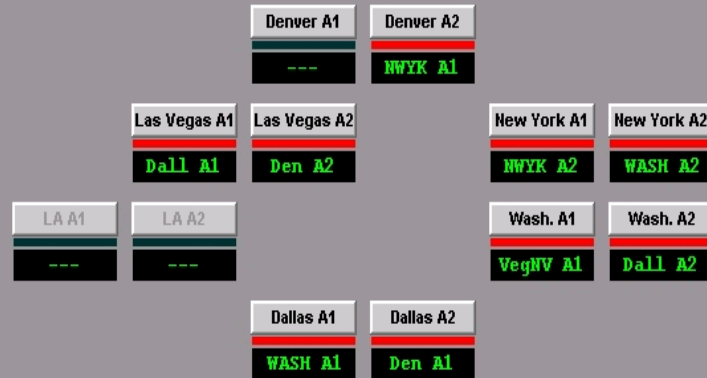
12.09. 15:38 Caution: inconsistent data! LSAN S1 is connected to an unknown slot/port in Houston.  
12.09. 15:58 Caution: inconsistent data! LSAN S2 is connected to an unknown slot/port in Houston.  
12.09. 15:58 Connection LSAN S1 - NWYK S1 has the operation status Down.  
12.09. 17:21 Interface Chicago A2 has the status Dormant.  
12.09. 17:21 Interface Chicago S2 has the status Dormant.  
12.09. 17:21 Interface LA A2 has the status Dormant.  
12.09. 17:21 Interface Houston S1 has the status Dormant.  
12.09. 17:21 Interface Houston S2 has the status Dormant.  
12.09. 17:30 Interface Chicago A2 has the status Dormant.  
12.09. 17:30 Interface Chicago S2 has the status Dormant.

Connect Disconnect

Accept Cancel

ASI-Bandwidth

### DVB - ASI Source



### SDI Source



### DVB - ASI Destination



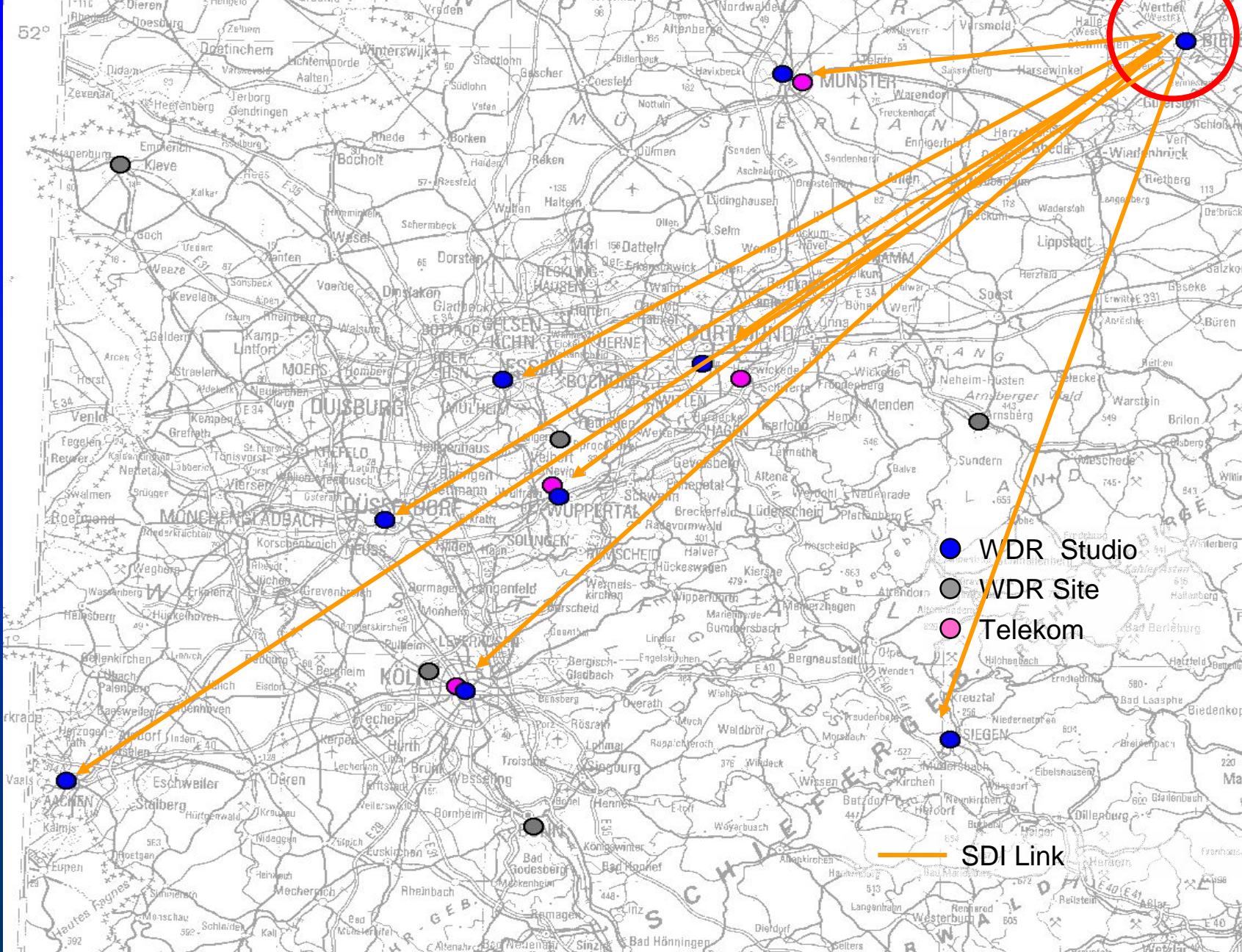
### SDI Destination





## Point to Multipoint (Bi)

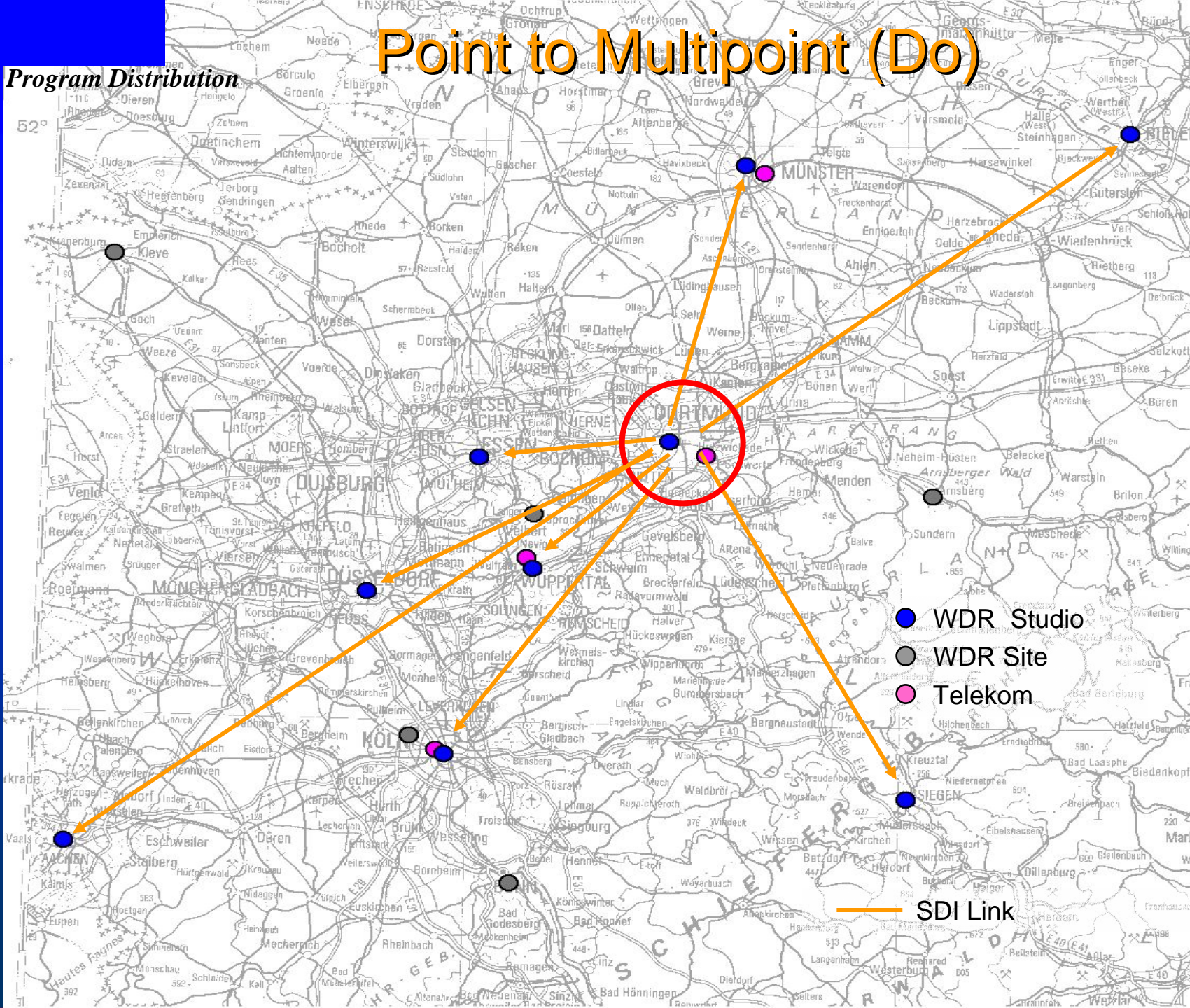
Program Distribution





## Point to Multipoint (Do)

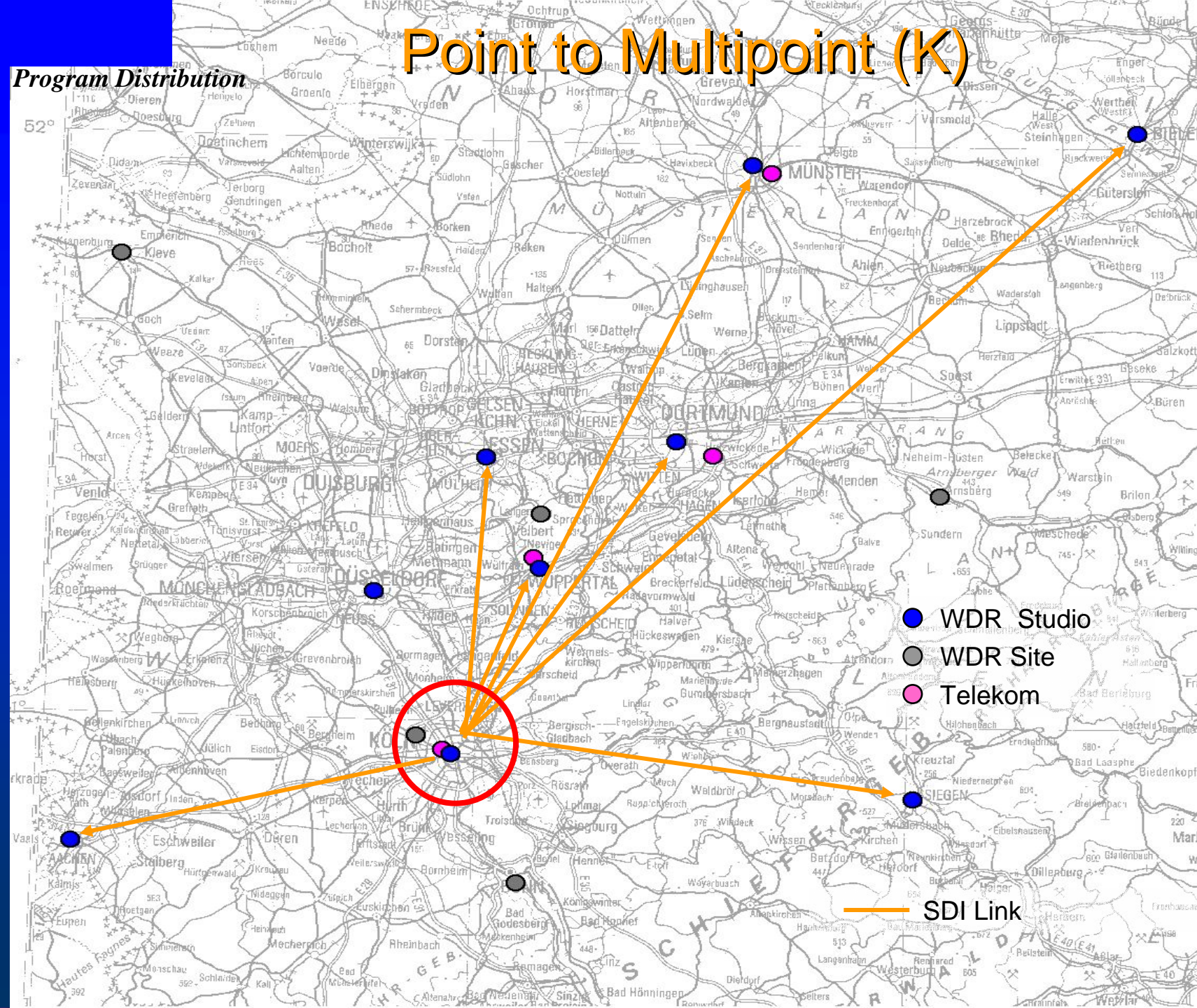
Program Distribution





## Point to Multipoint (K)

Program Distribution

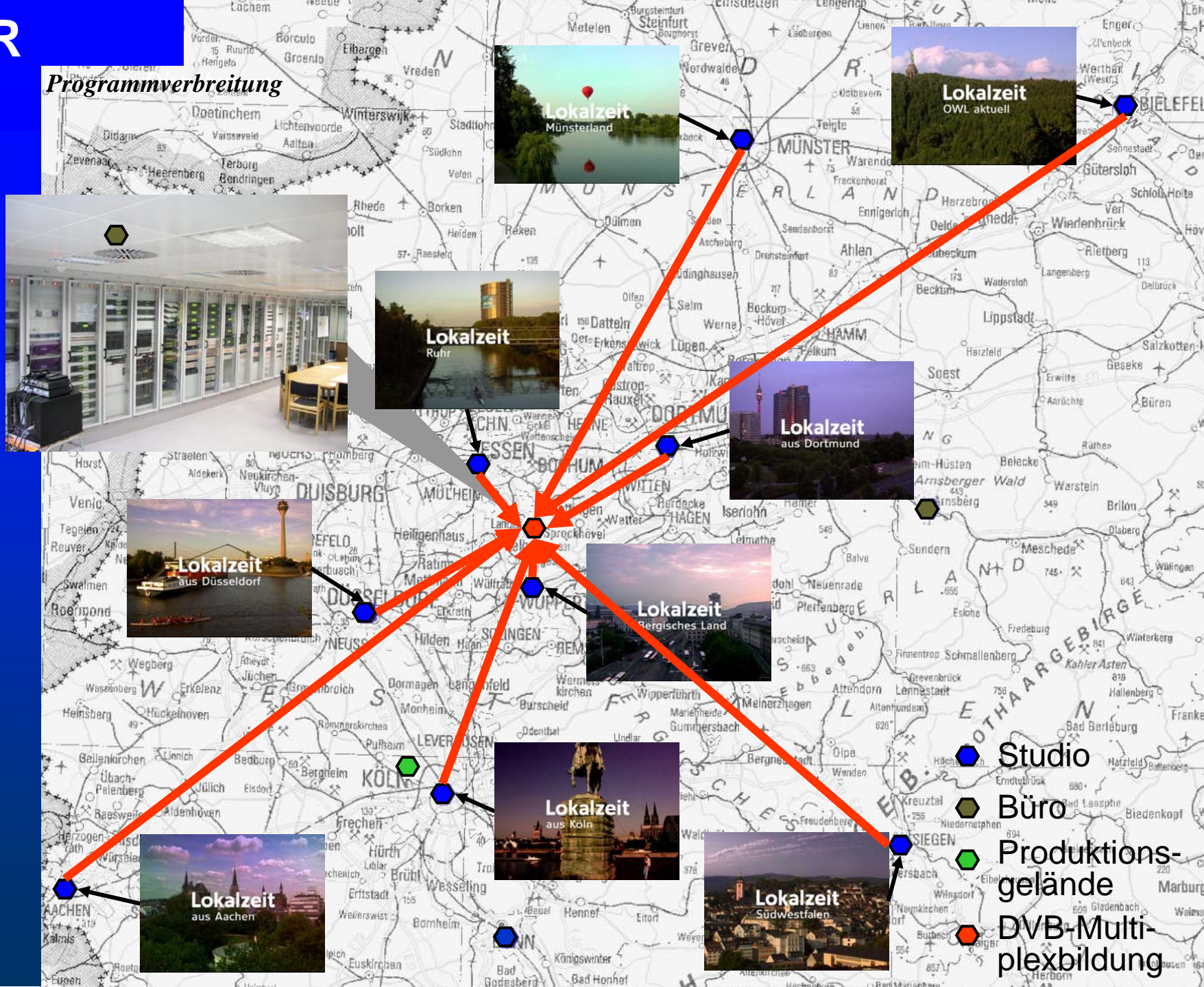


- WDR Studio
- WDR Site
- Telekom

SDI Link



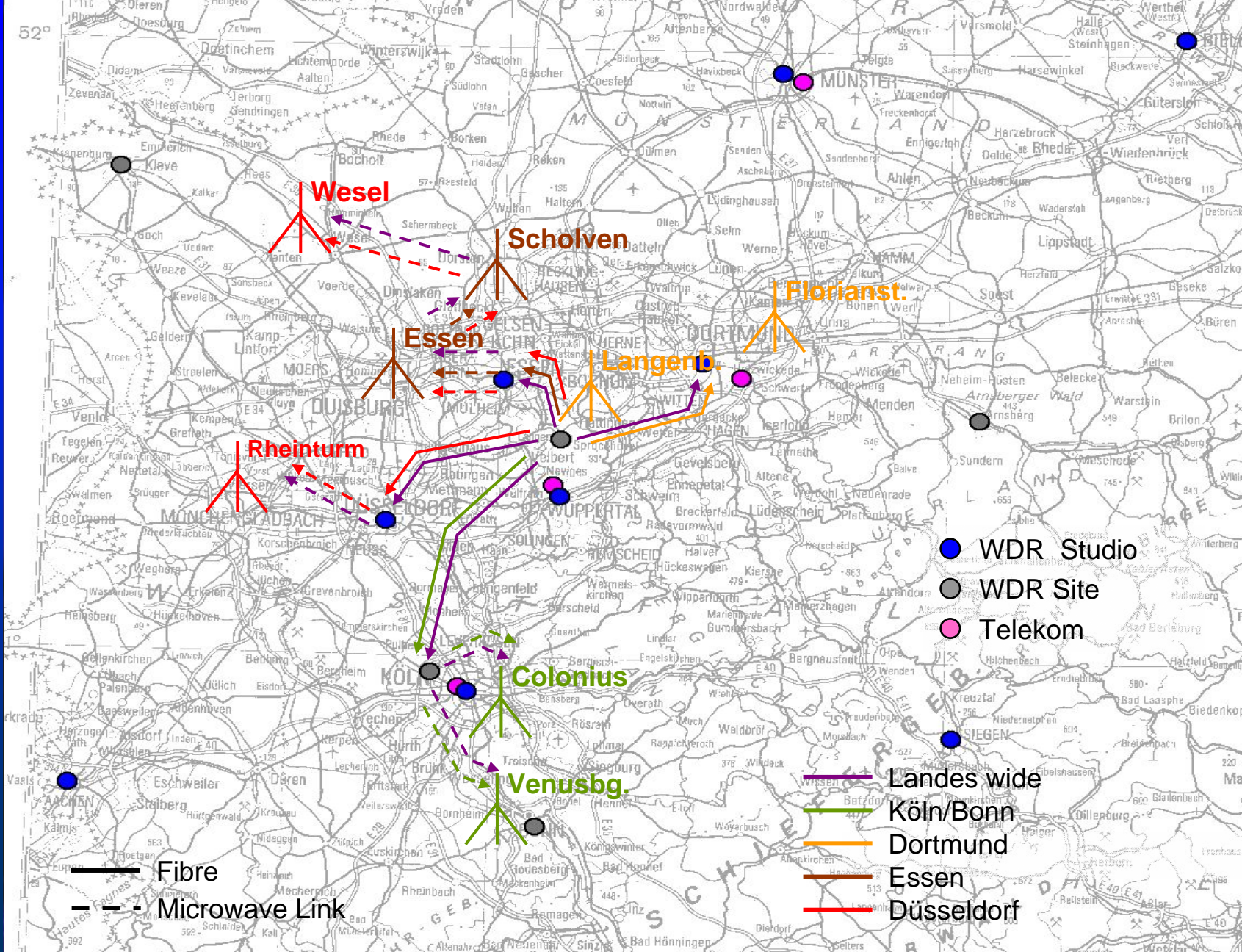
## Programmverbreitung





# Distribution DVB-T

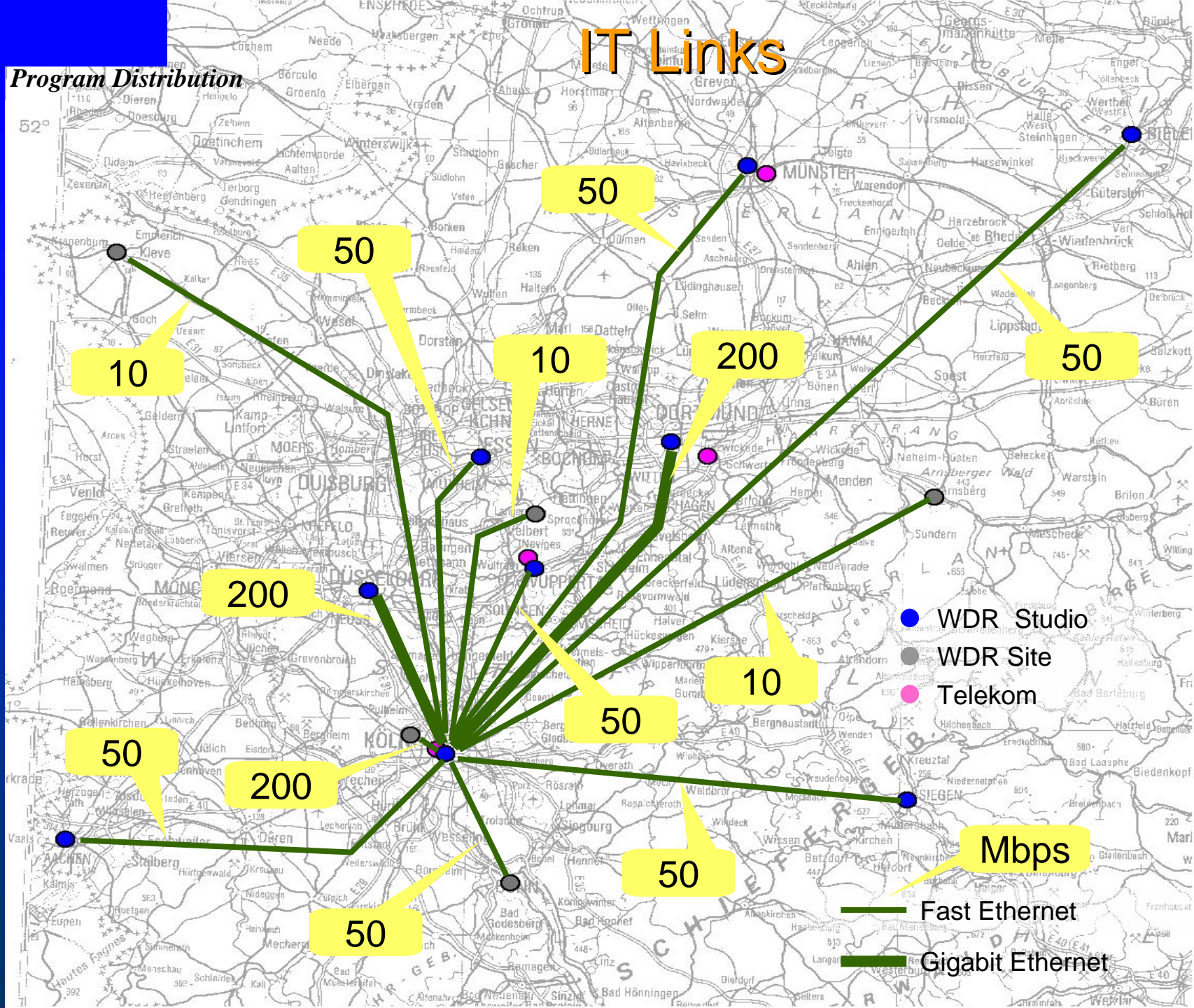
## Program Distribution





## IT Links

### Program Distribution



- WDR Studio
- WDR Site
- Telekom

— Fast Ethernet  
 — Gigabit Ethernet



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# Conclusions

- ATM/DTM
  - guarantees **absolute** quality of service
  - allocates resources **end to end**
- IP
  - **approaches** QOS by means of over provisioning
  - **no cost advantage** if not building on an existing IP infrastructure
  - **not suitable for DVB-T SFN** due to latency and jitter
- DTM vs. ATM
  - DTM offers same flexibility as ATM, while being simpler and less expensive



# The RegioNet approach ...





transparent data- and signal transmission, ...



open  
technology, ...





professional  
operation!





Thank you for your  
attention!