

TEN-34

A 34 Mbit/s infrastructure
for European Research

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TEN-34 The background

- **Nationally research networks moving up to 34 Mbps**
- **Nationally research networks piloting ATM**
- **Internationally in Europe the market offers 2 Mbps**
- **National 'Superhighways' connected by country lanes**

TEN-34 The diagnosis

Lack of international competition and regulation in Europe has seriously damaged our networking and our European competitiveness

TEN-34 Prognosis

- **Available capacity is not a problem**
- **Market is restricted by fears of liberalisation**
- **Commercial position of research community a key factor**

TEN-34 The prescription

- **Cooperation with PNO's**
- **Trial new technology**
- **Just do it**

TEN-34 Technology choice

- **IP Strength**
 - ubiquitous technology
 - good ‘raw’ performance
- **IP Weaknesses**
 - technical management capability
 - commercial management capability

TEN-34 Technology choice

- **ATM strengths**
 - managed technology
 - synchronised bit rates
- **ATM weaknesses**
 - slow in coming to market
 - questions over switched service

Technical Program

- **34 Mbps IP service as soon as possible**
- **34 Mbps ATM pilot in parallel**
- **Higher speeds planned**
- **Applications program**
- **Gateways to existing networks**
- **Matching global connectivity**

Technical Program contd.

- **two subnetworks (FUDI + Unisource)**
- **IP provided by TEN-34**
- **Acceptance testing**
- **1st Quarter to finalise**

The PNO's

- **F.U.D.I.**

- France Telecom
- BT
- Deutsche Telekom
- Telecom Italia

FR
UK
DE
IT } ABS

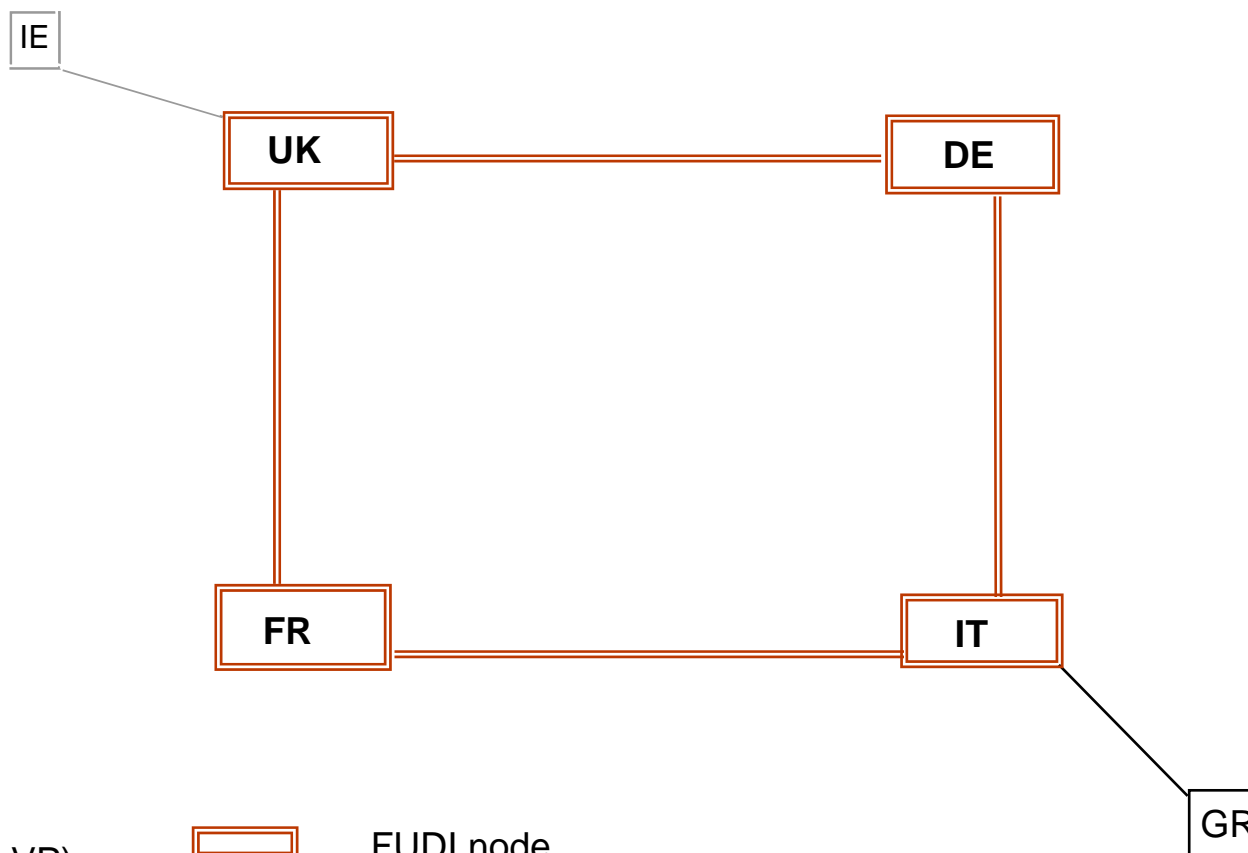
- **Unisource**




- Nordics
- Netherlands
- Switzerland
- Spain

- **Non-aligned:**

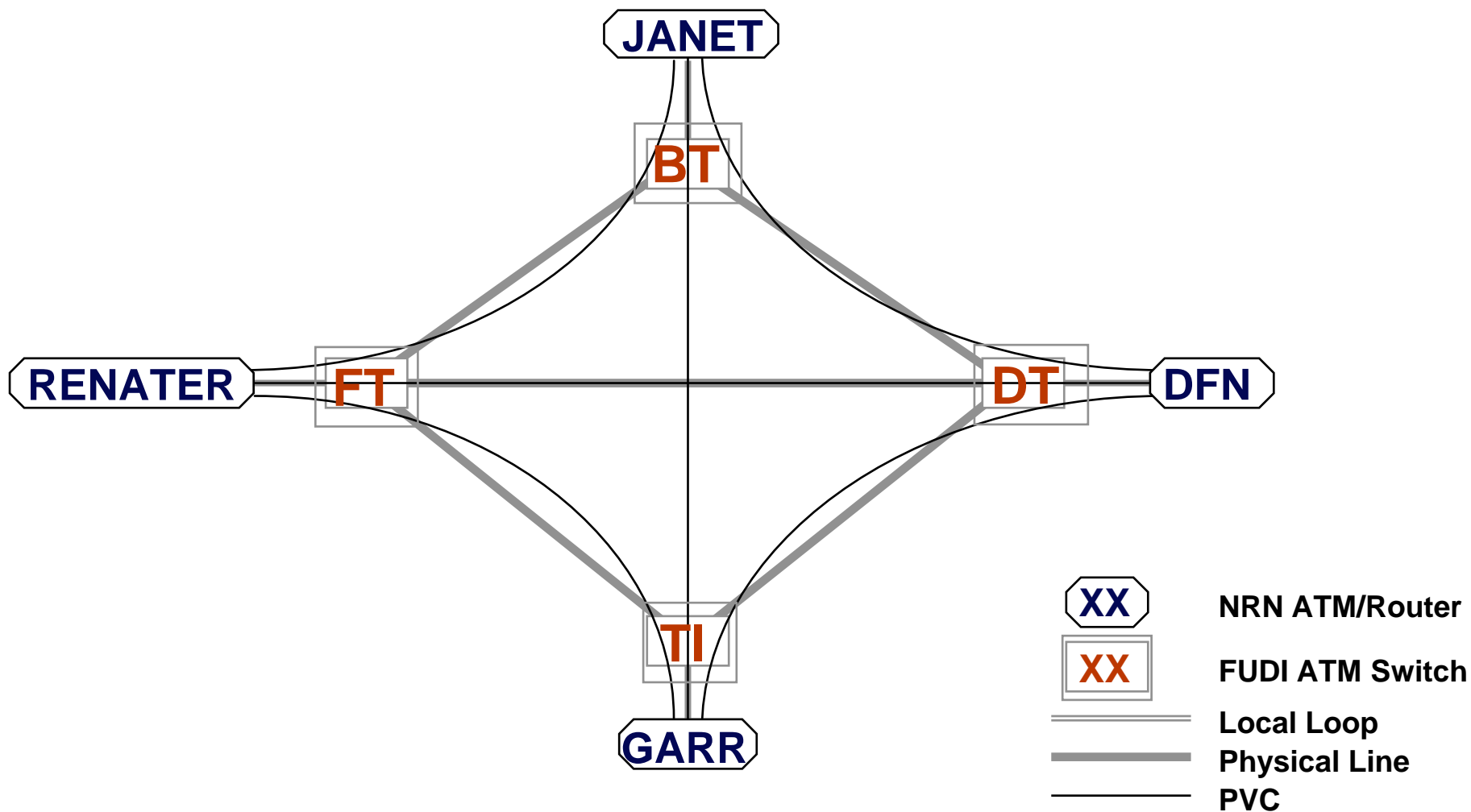
- Austria, Belgium, Greece, Luxembourg, Portugal

TEN-34: FUDI Interconnect (ABS)

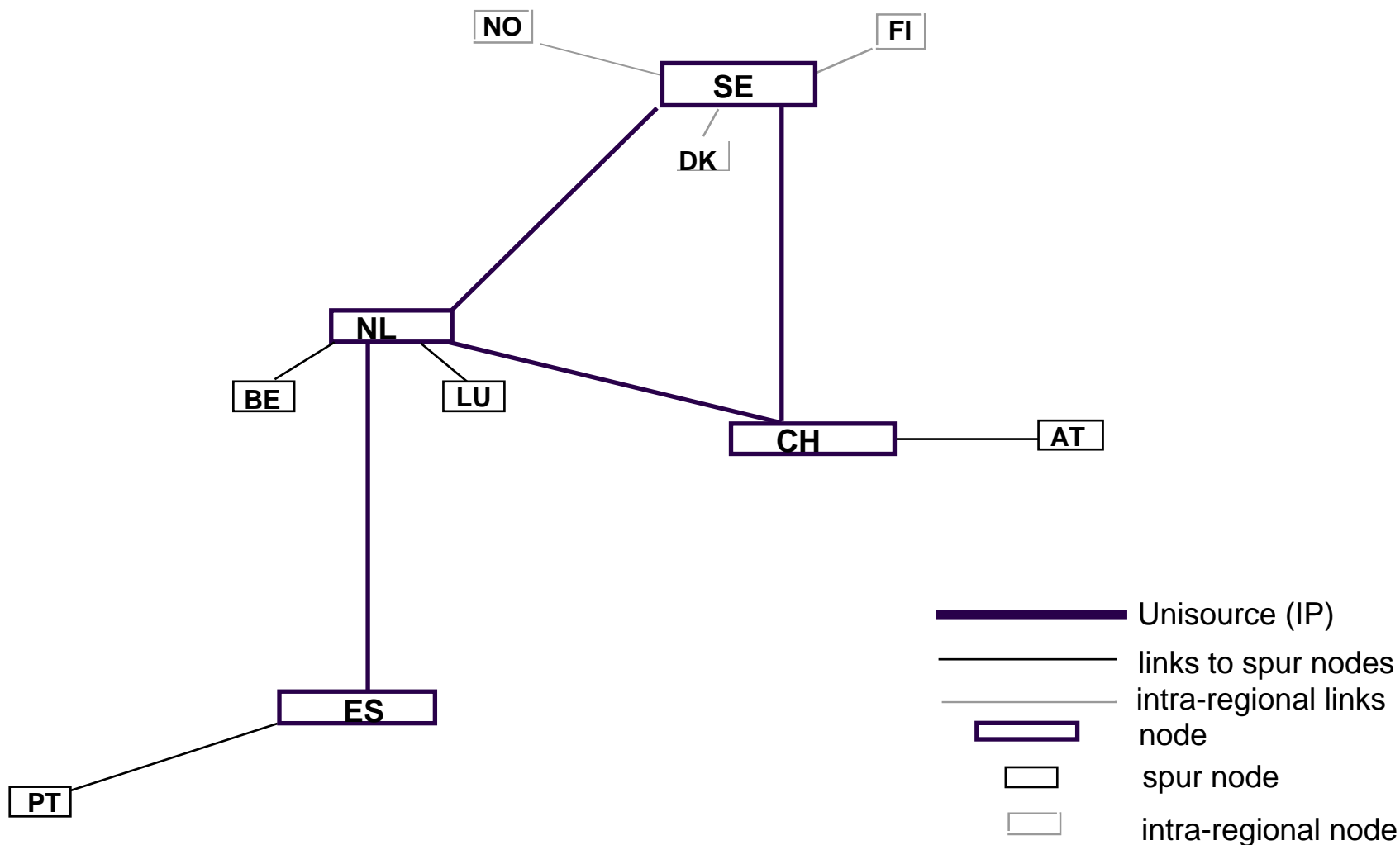


- | | | | |
|--|----------------------|---|---------------------|
|  | FUDI (ATM VP) |  | FUDI node |
|  | links to spur nodes |  | spur node |
|  | intra-regional links |  | intra-regional node |

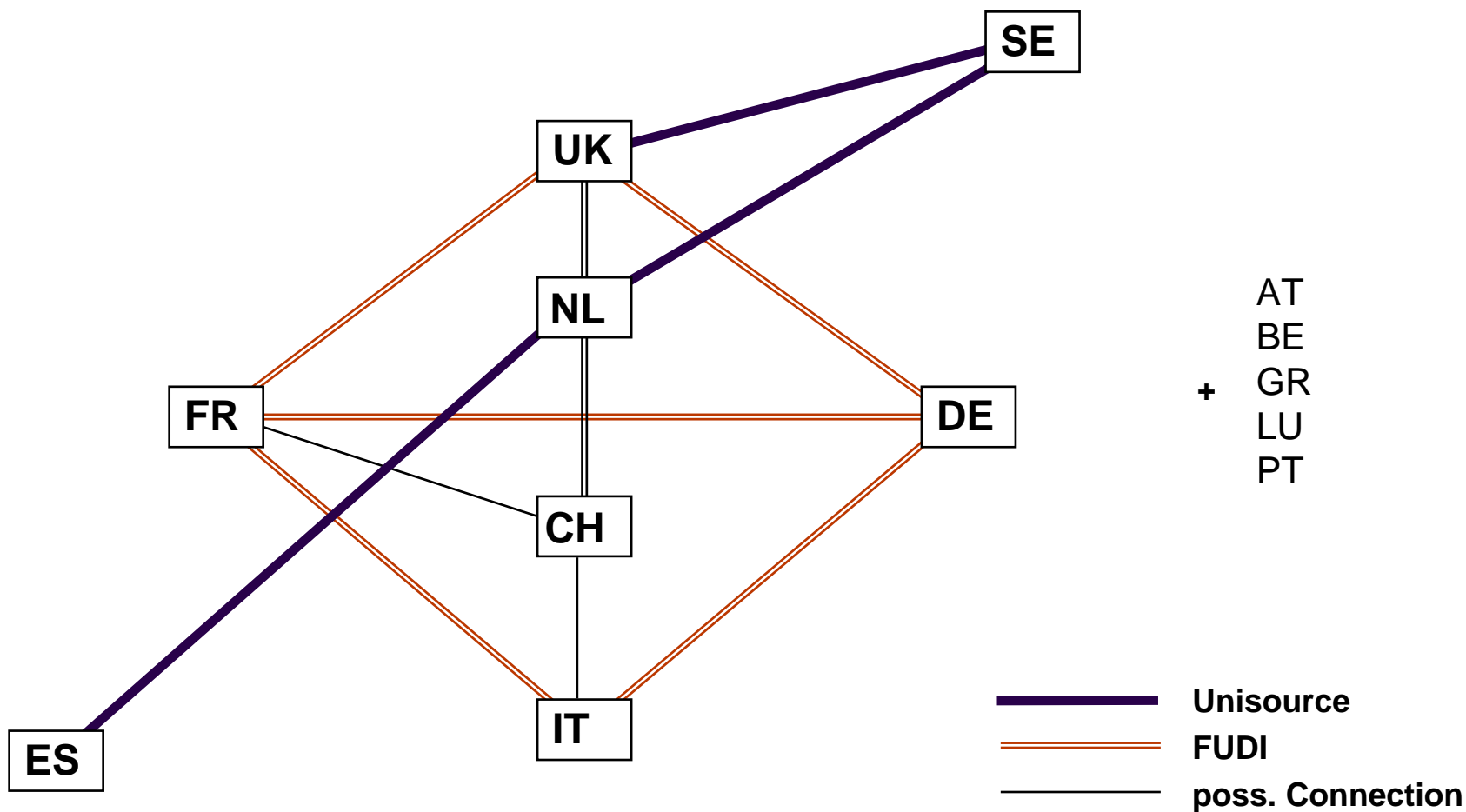
Planned FUDI Network (ABS)



TEN-34: Unisource Interconnect



Planned TEN-34 Production Network



TEN-34 Initial Test Program

- **TEN-34 Network Planning and Implementation**
- **IP over ATM (including VBR etc)**
- **ATM Performance Testing**
- **SVC Testing**
- **QoS Definitions and Experimentation**

TEN-34 Achievements

- **FUDI PNO's in**
- **Interconnect FUDI- Unisource**
- **'Non-aligned' countries in**

TEN-34 Costing Issues

- **Prices vary widely across Europe**
- **Need for a fair allocation model**
- **National costs must remain national**
- **Concept of target cost of supply**
- **Costing very sensitive to cost of transmission**

TEN-34 Challenges in 1996

- **Detailed configuration, including**
 - interconnection arrangements
 - access capacities
 - links for 'non-aligned' countries
- **Costs/Cost allocation/Cost justification/Pricing**
- **Use of ATM**
- **Acceptance testing**
- **Co-operation with JAMES**