**IV Convegno di GARR-B**
**Bologna, 24-26 giugno 2002**

# L'Università di Trieste e il Sistema Sanitario Regionale FVG

## L'organizzazione del SISR - Sistema Informativo Sanitario della Regione Friuli Venezia Giulia e sua integrazione con la Ricerca del Sistema Trieste: le nuove frontiere raggiunte con il Progetto GARR-B PoReR WP-29

*Paolo Inchingolo*
*Delegato Rettorale*
*Direttore GARR-B PoReR WP29*
***Università di Trieste***

# Health Telematics and Telemedicne in Trieste & region FVG: a long tradition

- in 1974 started the first regional health informatics & telematics (at 110 bit/s) service experiences
  - E.g. tele-collection of epidemiological data for the government of the regional health
- from 1988 Trieste experimented advanced health informatics and telematics solutions

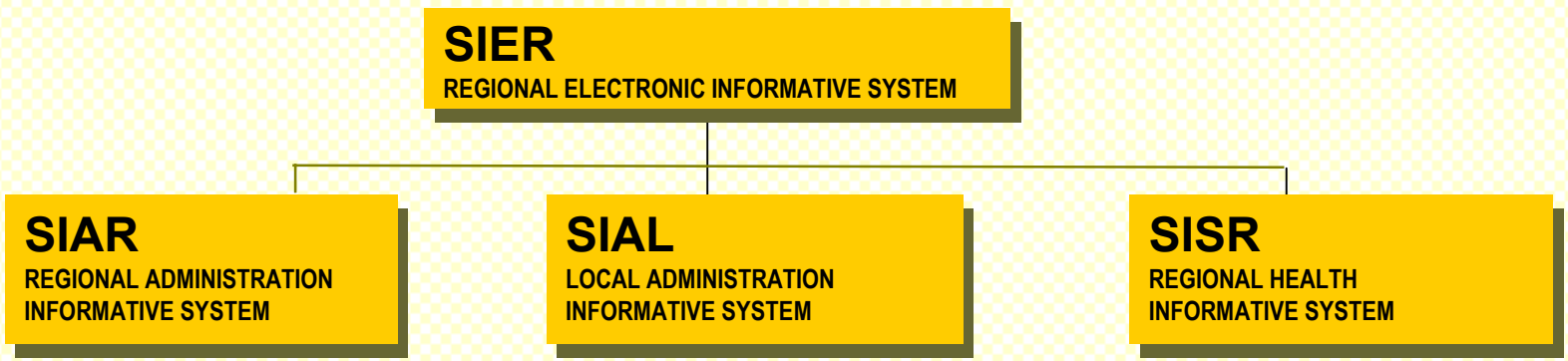
  thanks to its rich research environment, constituted by:
  - the University of Trieste
  - the CNR group GNBTS
  - the Area Science Park
  - many other scientific Institutions

# The institution of the FVG Regional Electronic Information System (SIER)

- In 1972 the Regione Friuli Venezia Giulia (FVG) instituted, by a regional law,
  - **the SIER – Regional Electronic Informative System**
  - **a Company (currently named Insiel) to design, develop and manage the SIER**
- With this legislative act, the Region FVG decided 30 years ago **to use informatics and telematics to govern all its activities**

# The institution of the FVG Regional Electronic Information System (SIER)

- The SIER was organized in three separate domains:
  - *SIAR (Regional Administration Informative System)*
  - *SIAL (Local Administration Informative System)*
  - *SISR (Regional Health Informative System).*



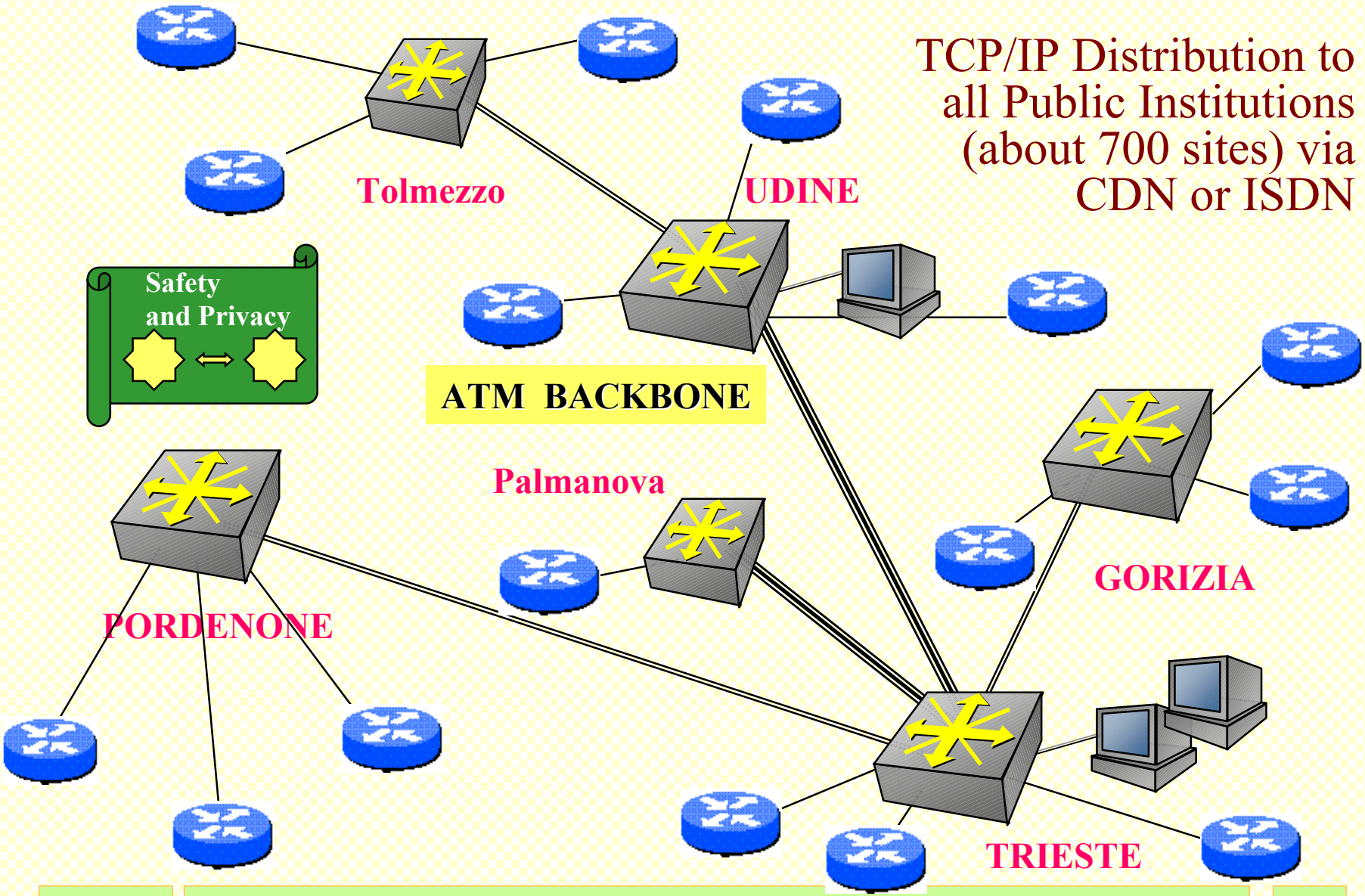
# The FVG Regional Electronic Information System (SIER)

- The three domains have progressively grown over these 3 decades
  - services
  - communications
- Since 1996 they are fully operating in three corresponding Intranet Autonomous Systems (SISR, SIAL, SIAR)
  - interconnecting the 700 sites of public institutions of the Region
  - interconnecting safe-branches of service companies as Insiel and Italtbs as well as universities and other research centers offering advances services
  - offering also cross services from one domain to the other (e.g. telemedicine services from a municipally - belonging to SIAL - to a group of hospitals - belonging to SISR)

# Regional Policy: CRTA (Regional Committee for Advanced Communications) of the Regional Government

- 2 febbraio 1996: Delibera della Giunta Regionale FVG di istituzione della Commissione Regionale per le Telecomunicazioni Avanzate (CRTA)
- 19-20 giugno 1996: Conferenza sulle Telecomunicazioni Avanzate
- ottobre 1996: CRTA: proposte riguardanti le modalità e gli strumenti di cui la Regione dovrà dotarsi al fine dei suo intervento nella materia
- 4 ottobre1996: Delibera della Giunta su: INDIRIZZI DELLA REGIONE NEL CAMPO DELLE TELECOMUNICAZIONI AVANZATE:

# ATM Private network of Regione FVG (1997)



# The FVG Regional Electronic Information System (SIER) and the RUPAR-FVG

- The three Intranet domains (SIAR, SIAL and SISR)
  - work since 1977 over a private ATM network
  - are organized as 3 private ASs (Autonomous Systems)
  - constituted in 1998 the first Italian

    *Unitary Network of the Regional Public Administrations*,

    called RUPAR-FVG

# The Rules of the RUPAR … the resolution of the FVG Regional Government - 5.6.98

DISPOSIZIONI TECNICHE

PER LA CONFIGURAZIONE E LA GESTIONE DELLE INTERCONNESSIONI NELLA COSTITUENDA INTRANET

**RETE UNITARIA DELLA P.A. DELLA REGIONE FVG**

(RUPAR-FVG)

TRA LE RETI DEGLI Enti LOCALI, LA RETE DELL'ENTE REGIONE, L'INTERNET E LE P.A. CENTRALI

a cura di Paolo Inchingolo

# SIAR, SISR and SIAL Autonomous Systems main connections of the SIER (1998)

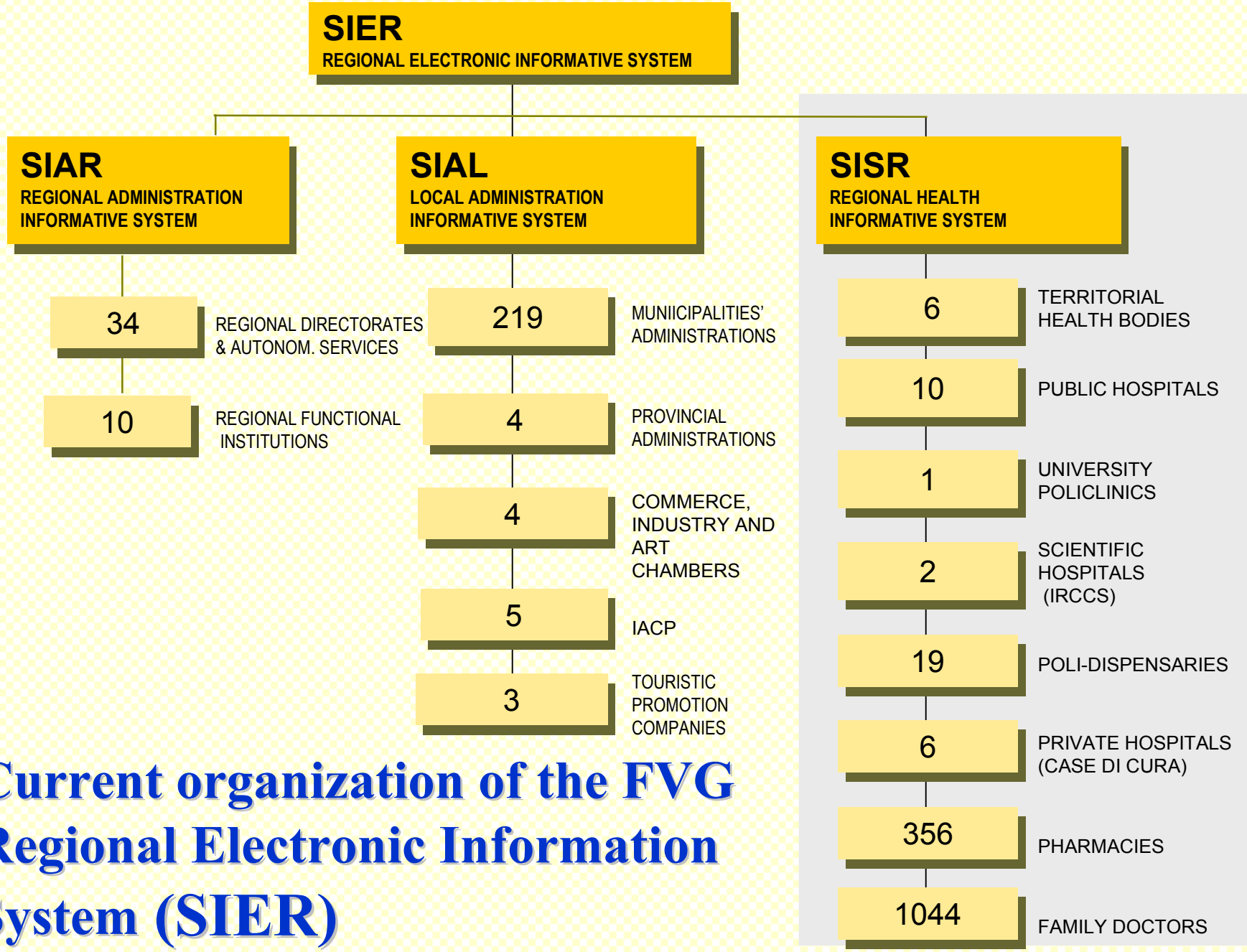
- Backbone nodes of SIAR, SIAL, SISR IP Ass
- Phone circuits distribution
- SIAR sites
- Main Health sites - SISR
- Main collection sites for local institutions - SIAL
- Internet connections

# The FVG Regional Electronic Information System (SIER) and the RUPAR-FVG

- Precise regional laws and rules from 1998 provide ordered uses and interconnections within the administrations of the SIER - RUPAR-FVG and with external public and private administrations.

  Examples:

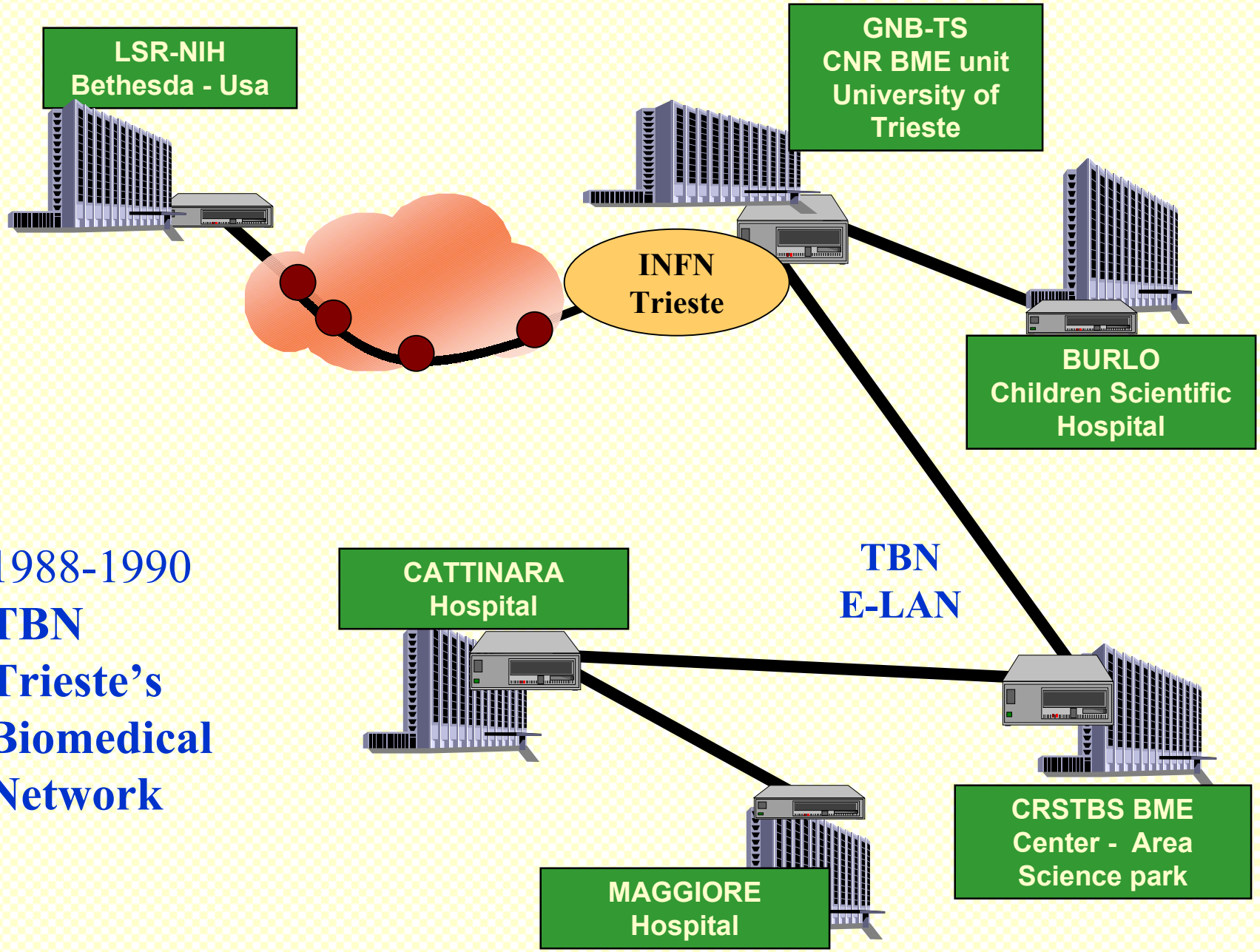
  - Harmonization of intranet network assignments
  - Rules for routing, firewall and DMZ
  - Unique organization of e-mail service
  - Rules for responsability and safety management



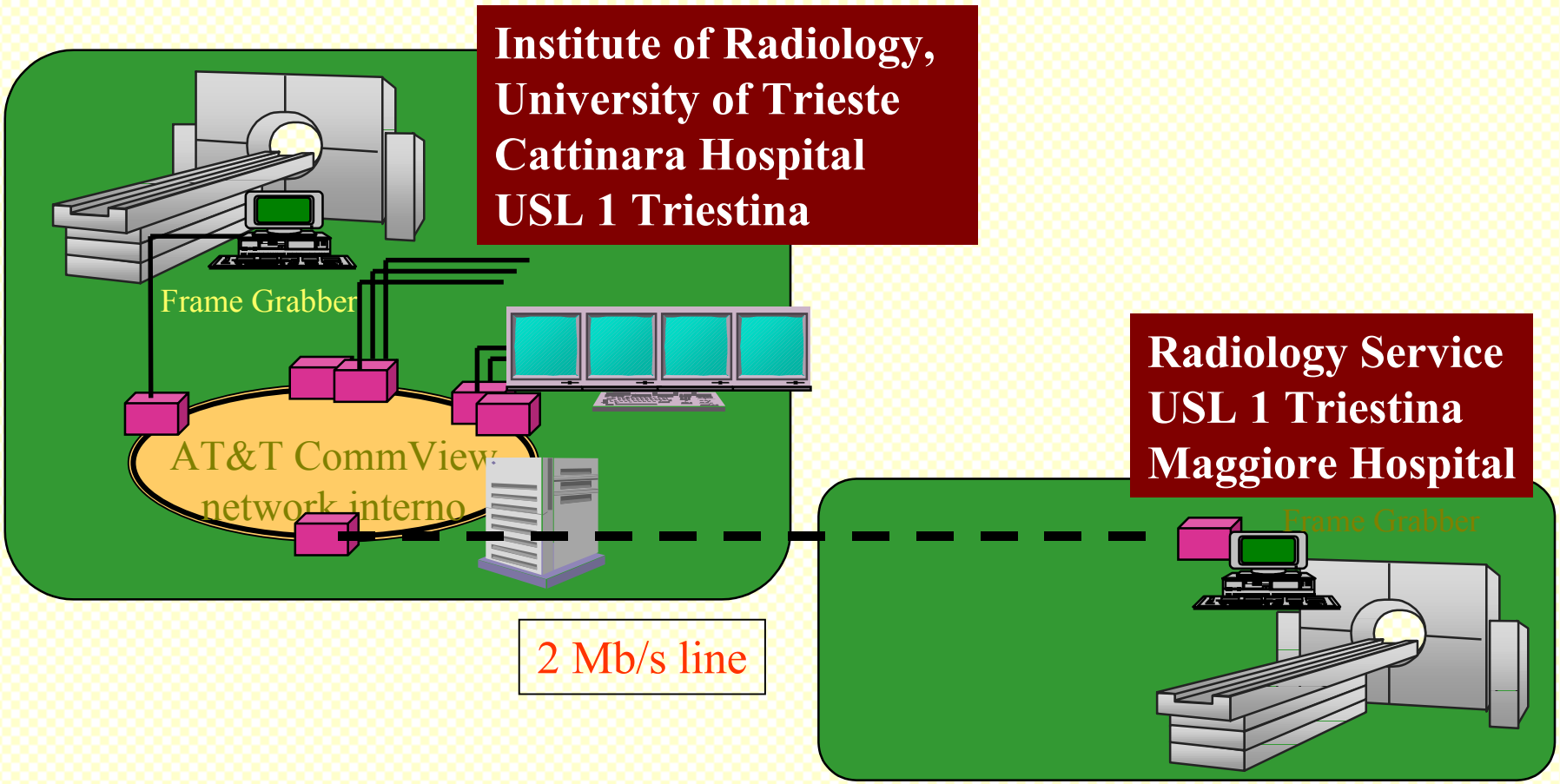

# Current organization of the FVG Regional Electronic Information System (SIER)

# The FVG Regional Electronic Information System (SIER) and the RUPAR-FVG

- The growth of the RUPAR-FVG has been highly favored by the tight collaboration with
  - the University of Trieste
  - The Area Science Park
  - other local research institutions


LSR-NIH
Bethesda - Usa
GNB-TS
CNR BME unit
University of
Trieste
INFN
Trieste
BURLO
Children Scientific
Hospital
1988-1990
TBN
Trieste's
Biomedical
Network
CATTINARA
Hospital
TBN
E-LAN
CRSTBS BME
Center - Area
Science park
MAGGIORE
Hospital

# Trieste: 1988 First Telemedicine-PACS installation in Europe

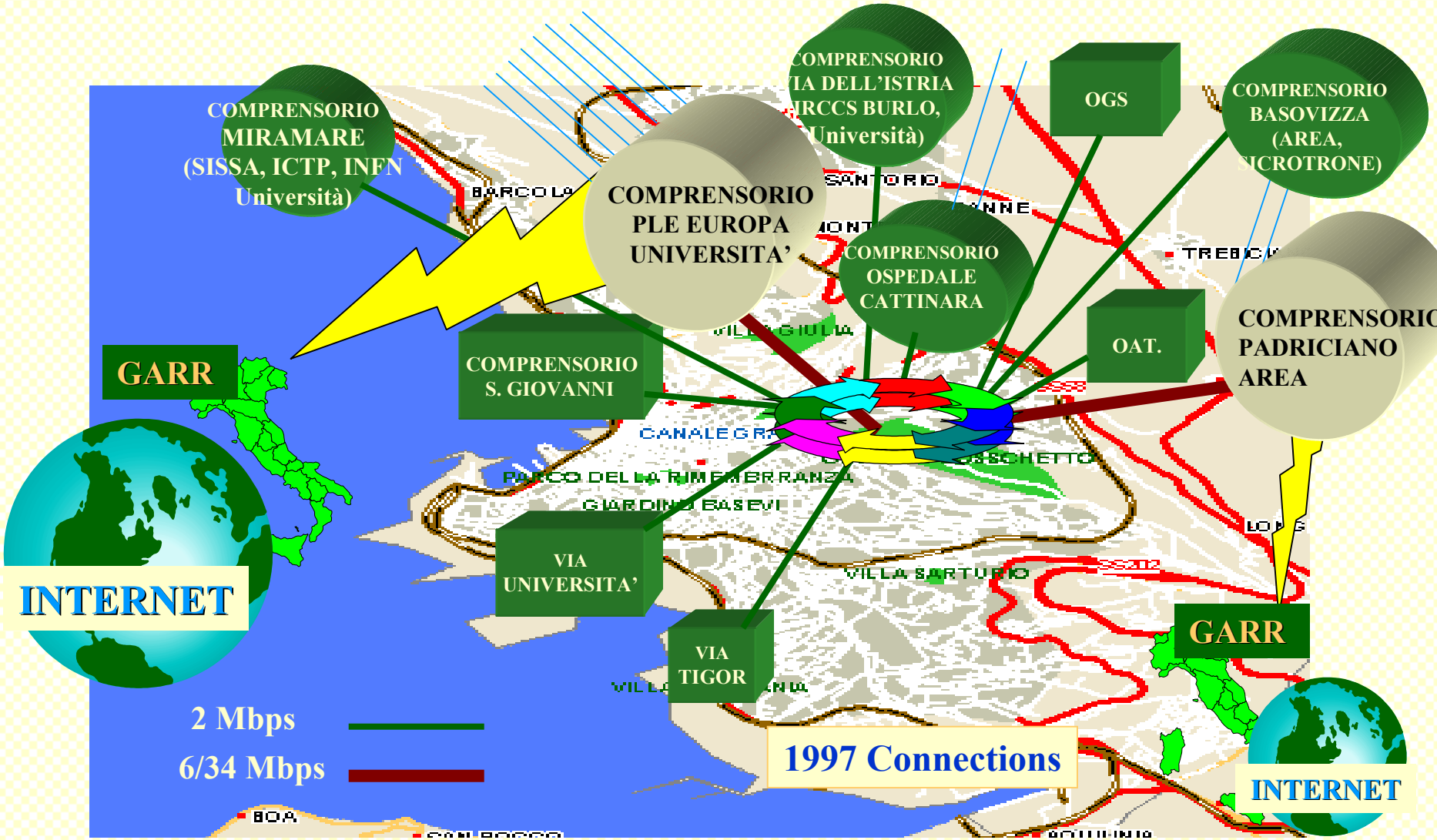


# Trieste Science City:
# First adventures in Italy and in Europe
## end of ‘80 - beginning of ‘90

- ‘88 Trieste-Bethesda Biomedical network and INFN-TS network
- ‘89 Trieste-Cattinara: First fiber-optic networked Hospital
- ‘89 Trieste-Cattinara: First in Europe commercial PACS system
- ‘90 SIST - Sistema Informatico Scientifico Triestino
- ’90 GARR-Pole of Trieste
- ‘90 First CDN-based Scientific & Academic network CDN
- ‘91 Trieste-Cineca (Bo) - First national 2 Mb/s link in Europe
- ‘92 First Europe-USA e-mail X400 service
  1,5 Mb/s with Trieste-USA link - EC Cosine project
- ‘92: invention of the geographic domains: TRIESTE.IT and FVG.IT
- ‘92 RIPE-DANTE European Research Network Presidence
- ‘93 First Italian Metropolitan Area Network (34 Mb/s SIP/Alcatel)

# 1993: First Metropolitan Optical -Fibers Network of Trieste

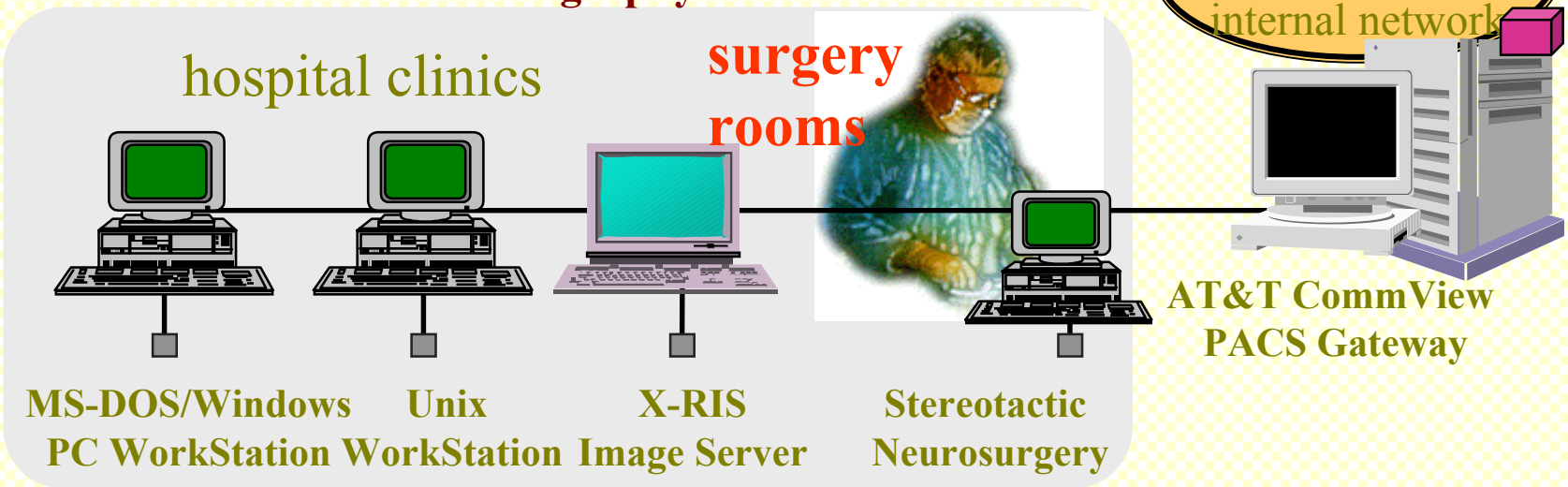
## The SIST Network - Intense collaborative Scientific Research

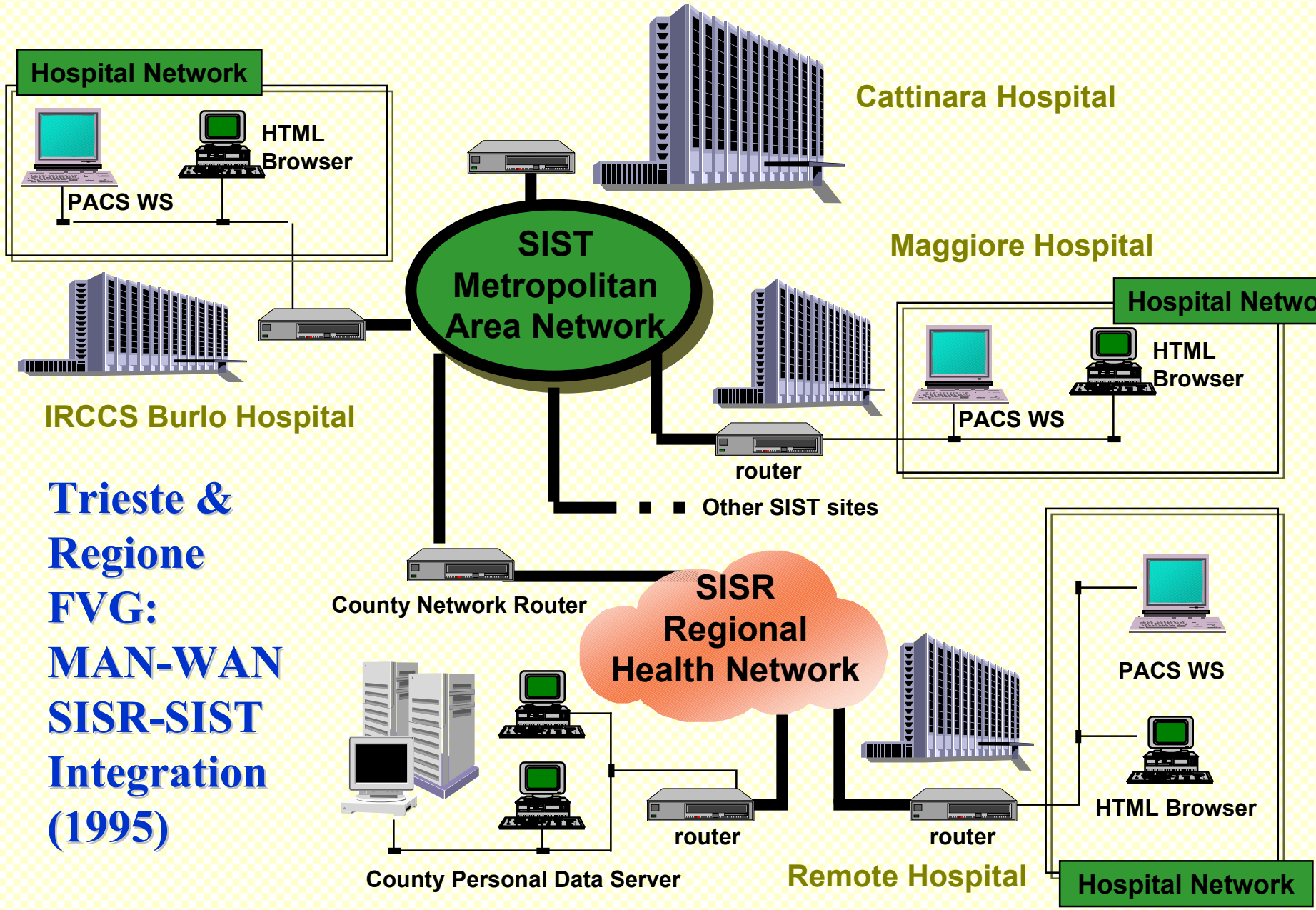


# PACS telemedicine integration in SIST-TBN

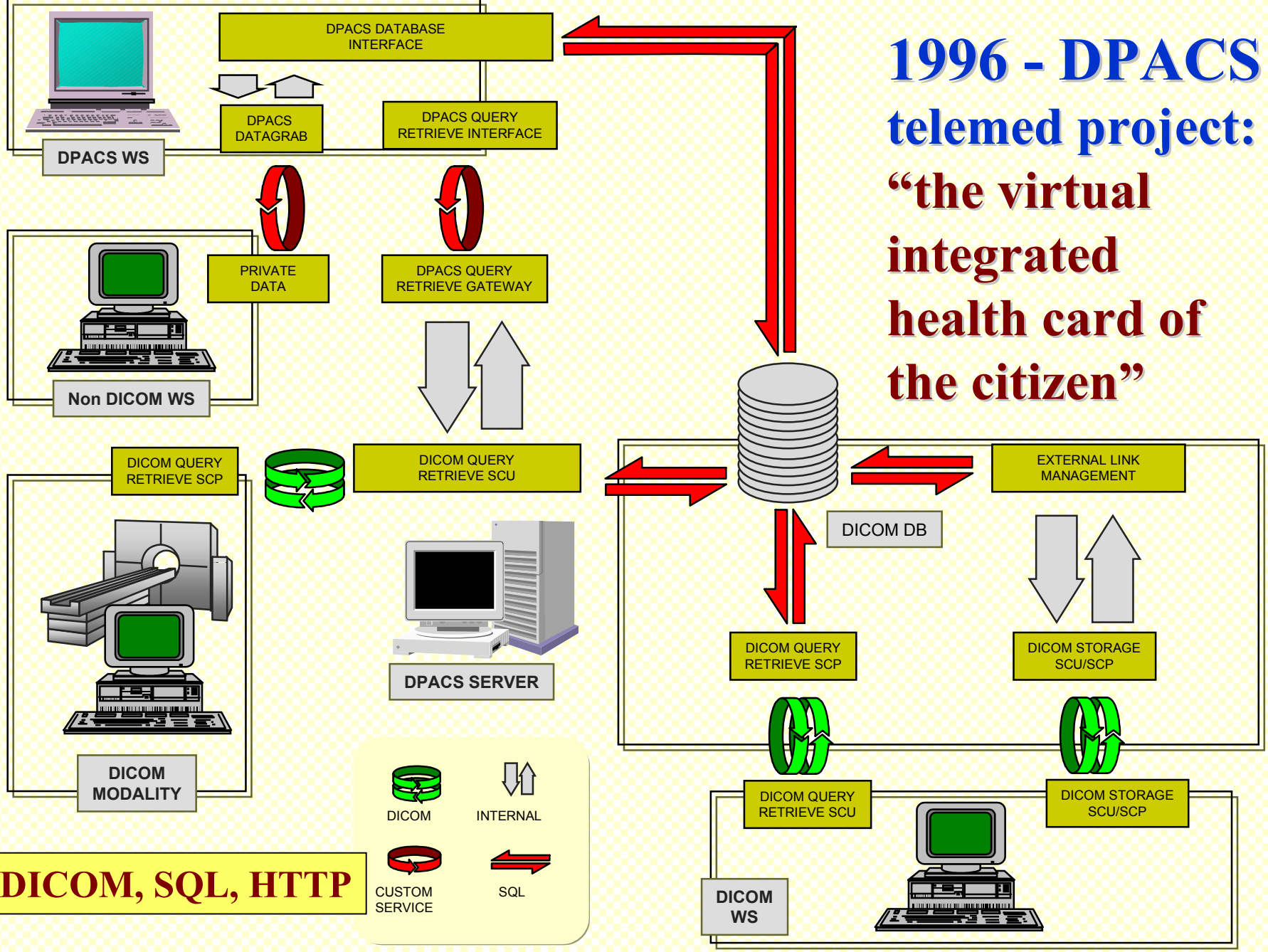
ISO/OSI compliant Remote access to PACS
Development of Open and Versatile Tools
for Remote Multi-Platform Workstations

- **1992: XRIS - X-Window Remote Image Station**
- **1993: ARIS - Autonomous Remote Image Station**
- **1994: SRIS - Integration with Stereotactic Neuro-surgery**
- **1995: HRIS - HTML/HTTP browser**
- **1995: SYMREP – Integration with Elettra Synchrotron Mammography beam line**




Hospital Network
HTML Browser
PACS WS
Cattinara Hospital
SIST Metropolitan Area Network
Maggiore Hospital
Hospital Network
HTML Browser
PACS WS
IRCCS Burlo Hospital
router
Other SIST sites
Trieste & Regione FVG: MAN-WAN SISR-SIST Integration (1995)
County Network Router
SISR Regional Health Network
PACS WS
HTML Browser
router
router
County Personal Data Server
Remote Hospital
Hospital Network

# 1996 - DPACS telemed project: "the virtual integrated health card of the citizen"



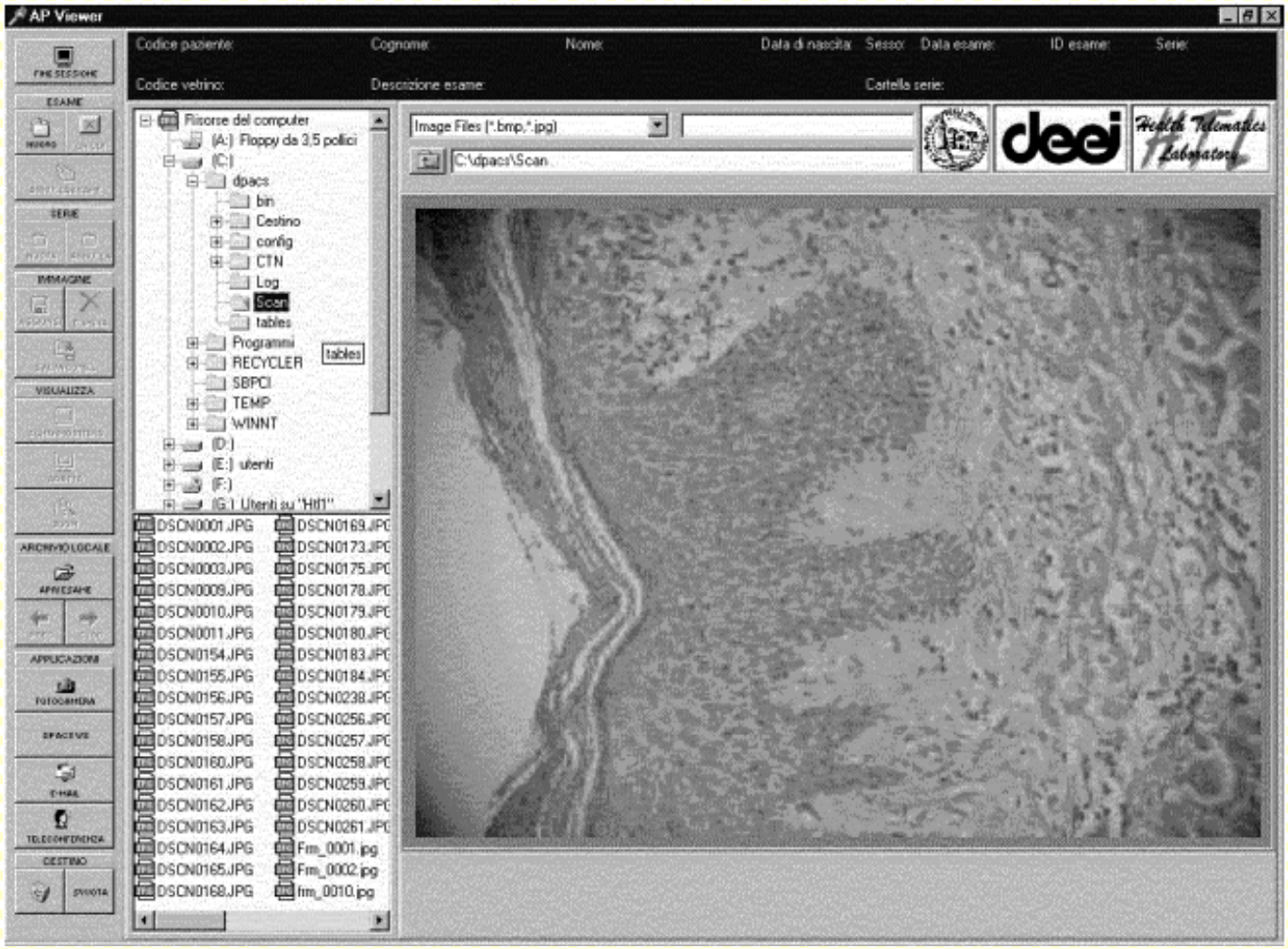

**DICOM, SQL, HTTP**

# 1996 - DPACS telemedicine project

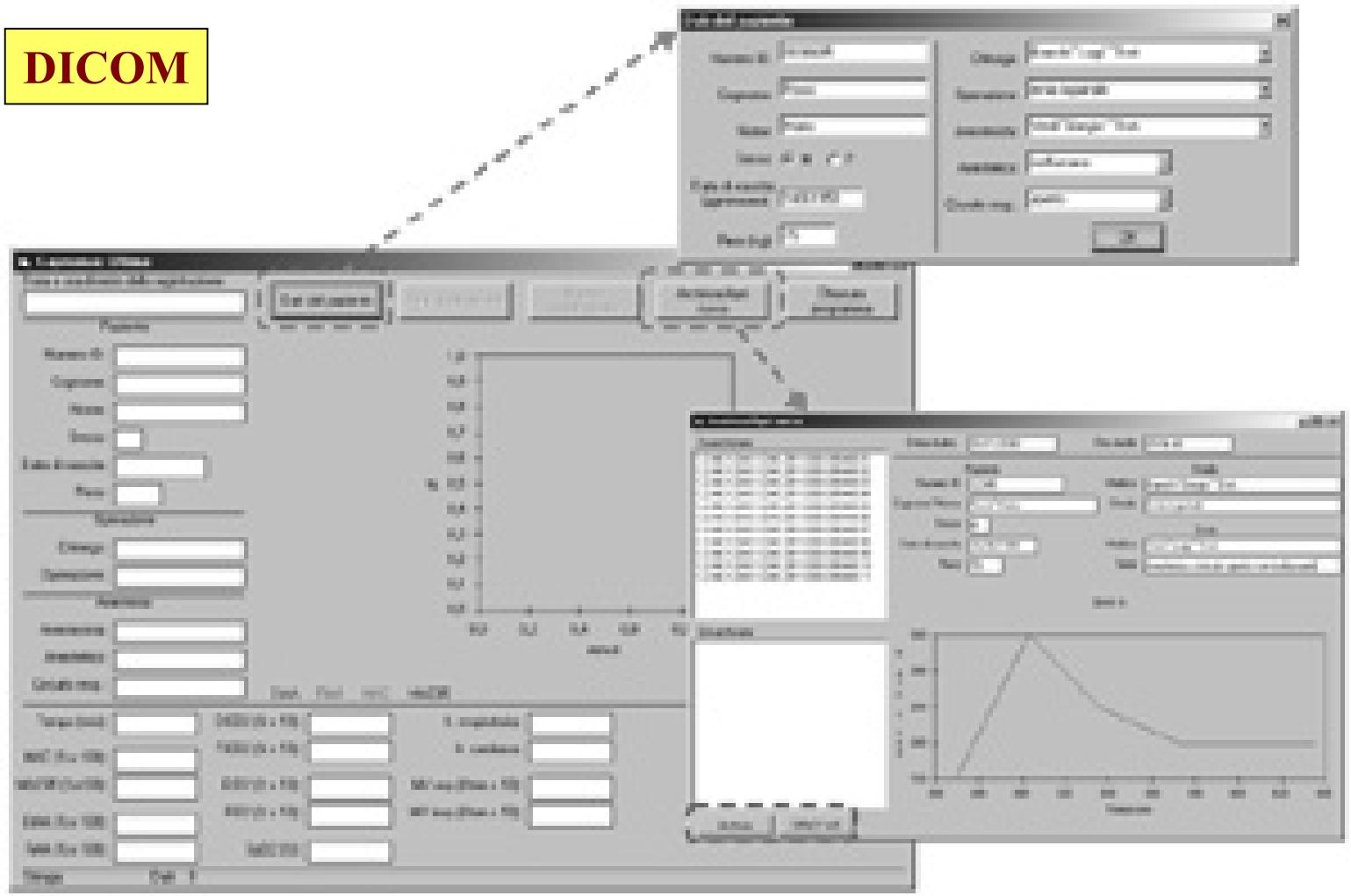
- DPACS "Data and Picture Archiving and Communication System“:
- development of an open, scalable, cheap and universal system with accompanying tools,
  - to store, exchange and retrieve all health information of each citizen
  - at hospital, metropolitan, regional, national and European levels,
  - thus offering an *"integrated virtual health card of the European Citizens"*

# DPACS: Anatomo-pathology Department integration

**DICOM**

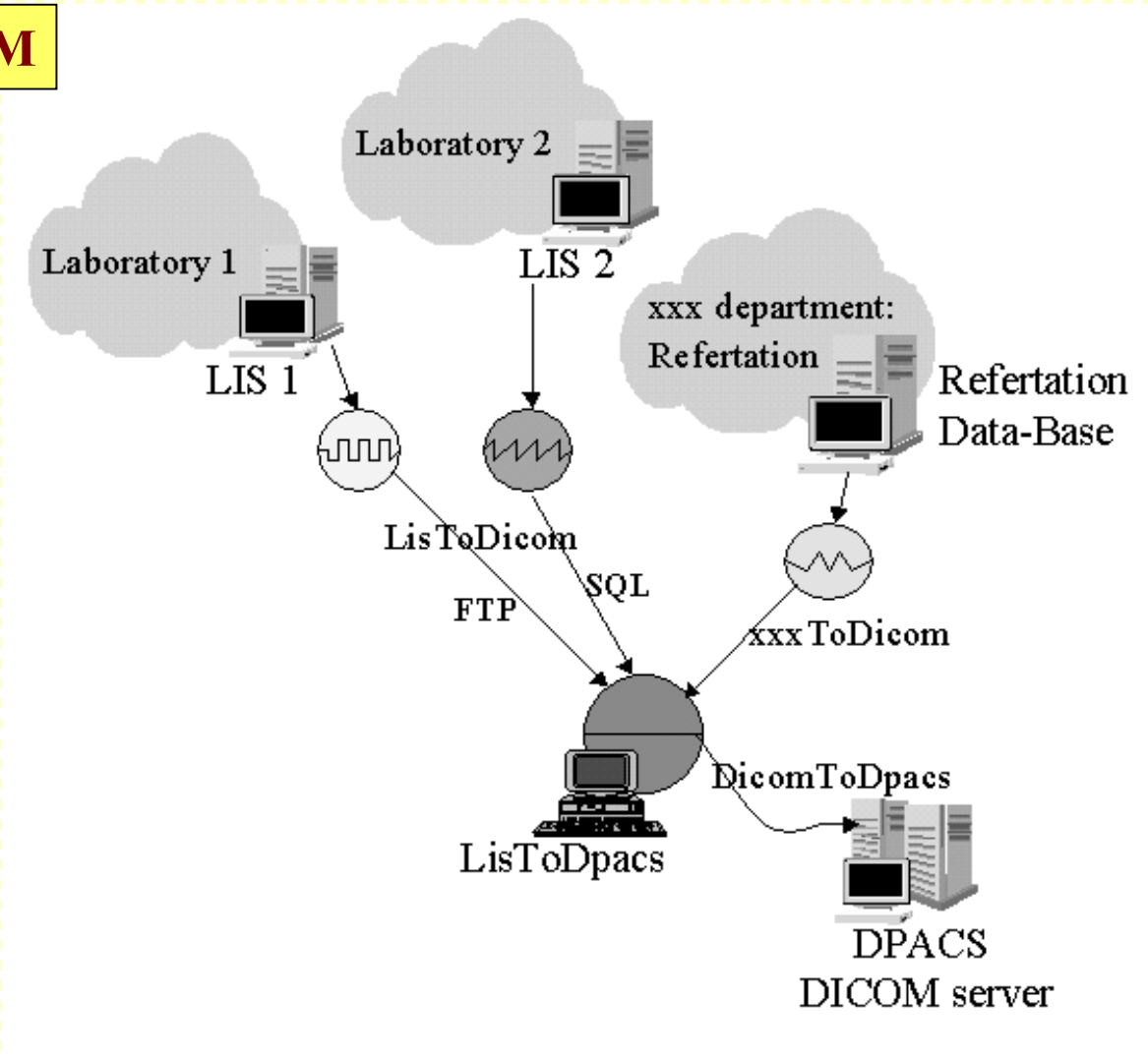


# DPACS: Anesthesia Department integration



# DPACS: Clinical Chemistry Lab integration

**DICOM**



# GARR-B PoReR WP29

MURST/MIUR Project GARR-B

Empowering of Regional Networks

# The New Telematic Network of 2000's Trieste

**with extensions to**

**Region FVG (Udine, Pordenone, Gorizia)**

**and**

**part of Region Veneto (Portoguraro)**

formally

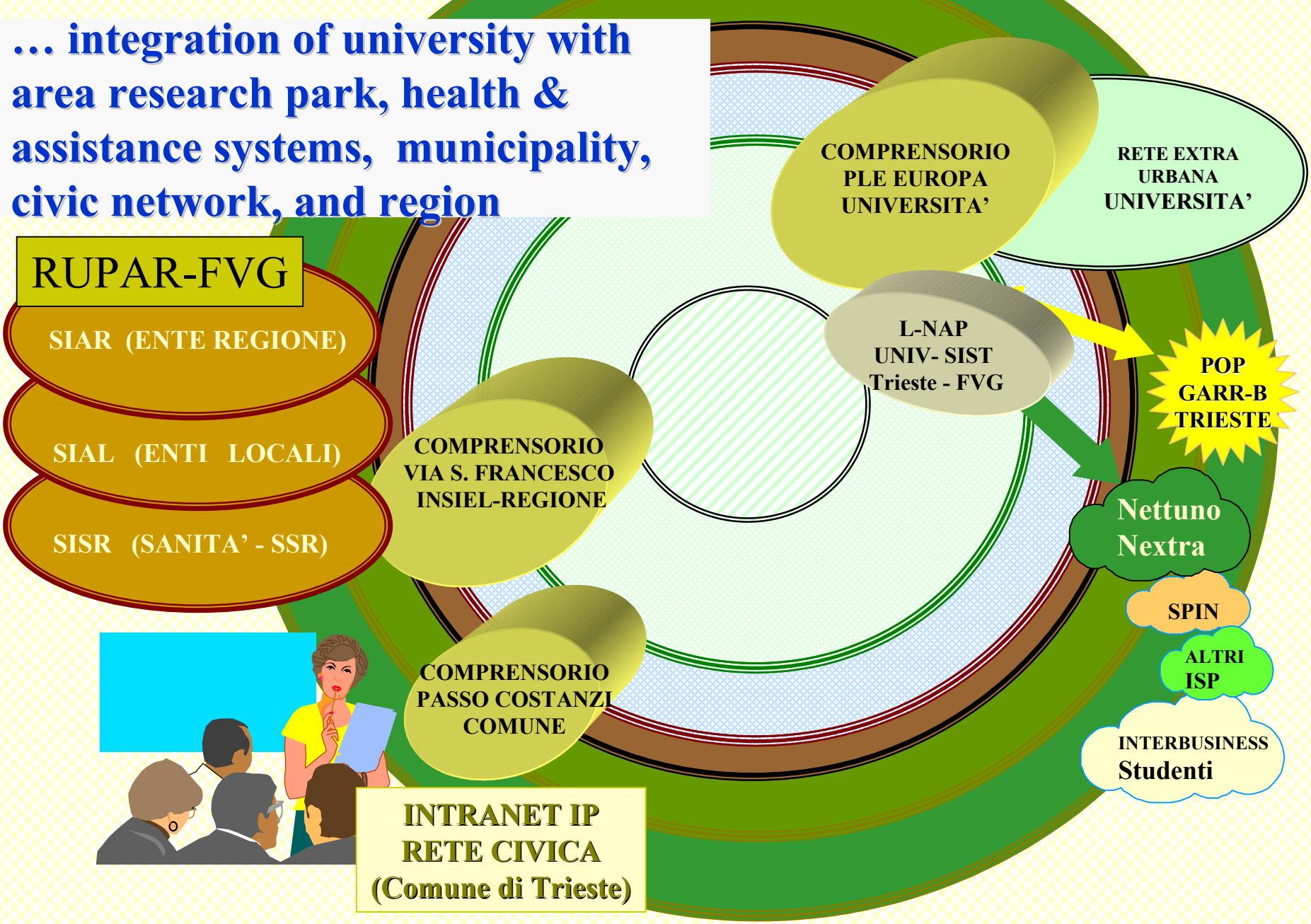
**GARR-B PoReR WP29**

# The New Telematic Network of 2000's Trieste

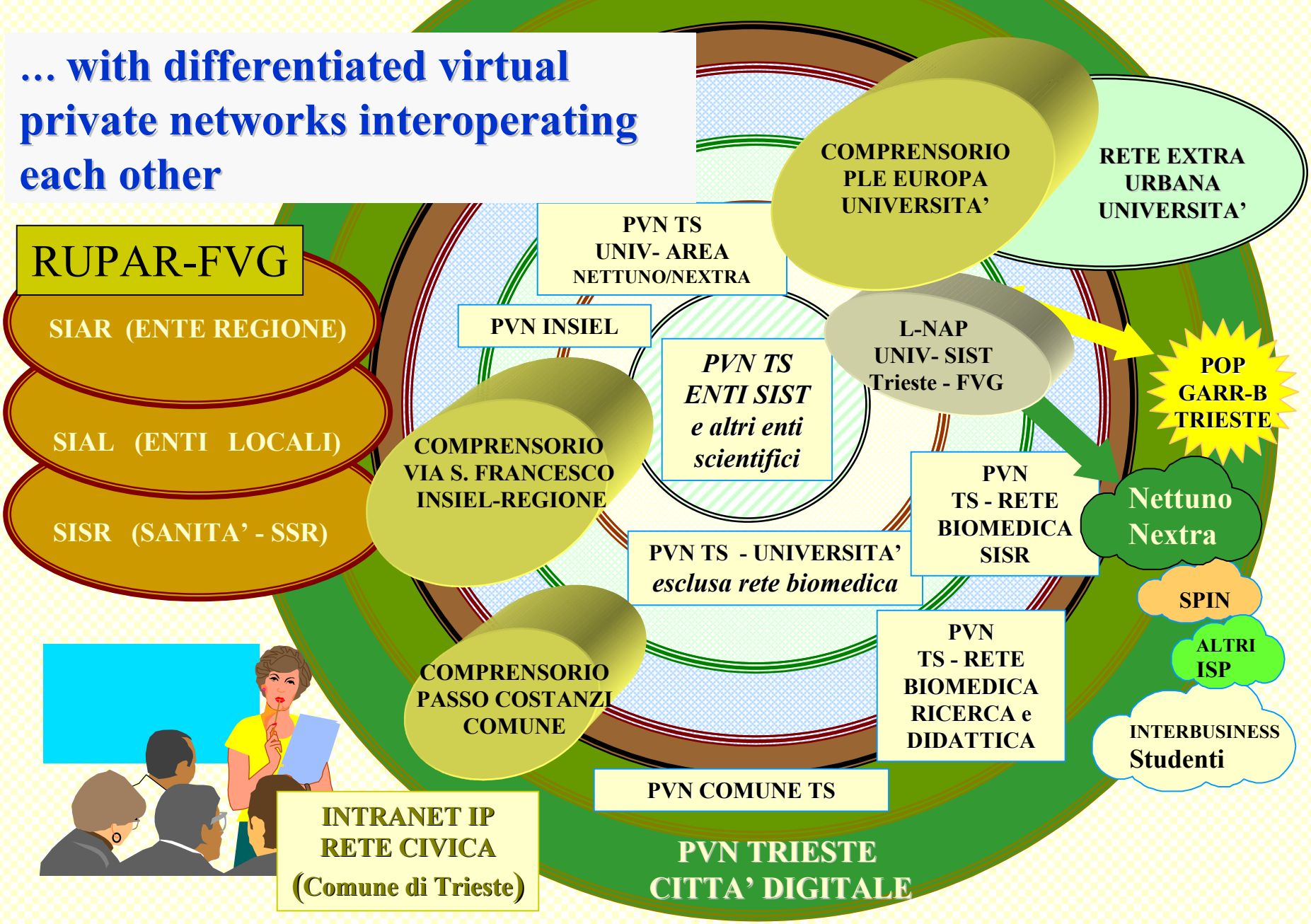
***An Agreement of*** University of Trieste
with Telecom Italia & CSELT RD

***A Cooperation of*** University of Trieste
with Municipality of Trieste, Province of Trieste,
Insiel spa - Region FVG,
Area Research Park, 3 Hospitals,
all other scientific Institutions,
some other companies

# … integration of university with area research park, health & assistance systems, municipality, civic network, and region

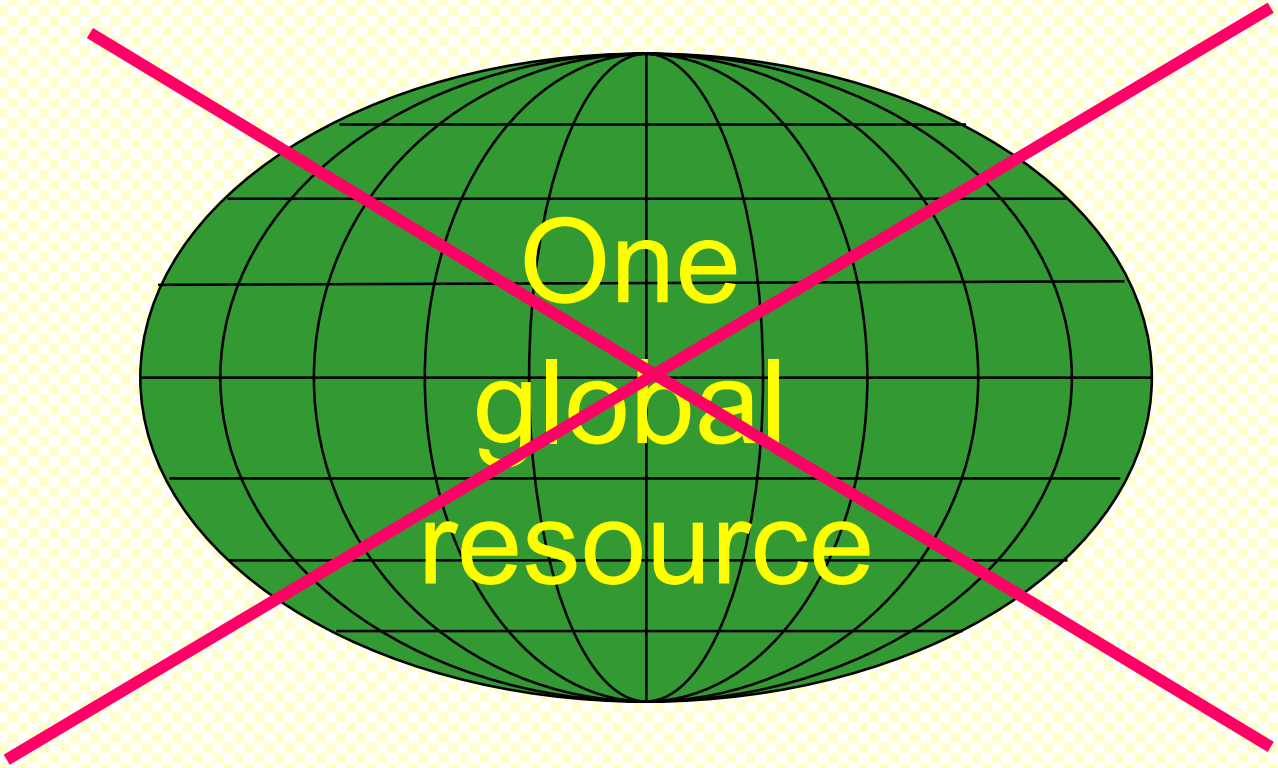


# … with differentiated virtual private networks interoperating each other



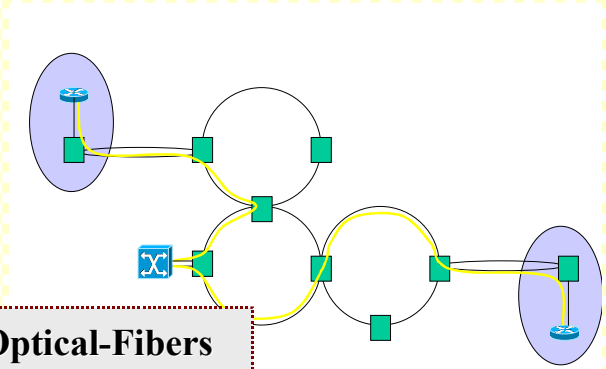
# The characteristics of the New Telematic Network of 2000' Trieste (GARR-B PoReR WP29) are:

# The TCP/IP INTERNET …..




Is not the solution for the New Telematic Network of 2000's Trieste …

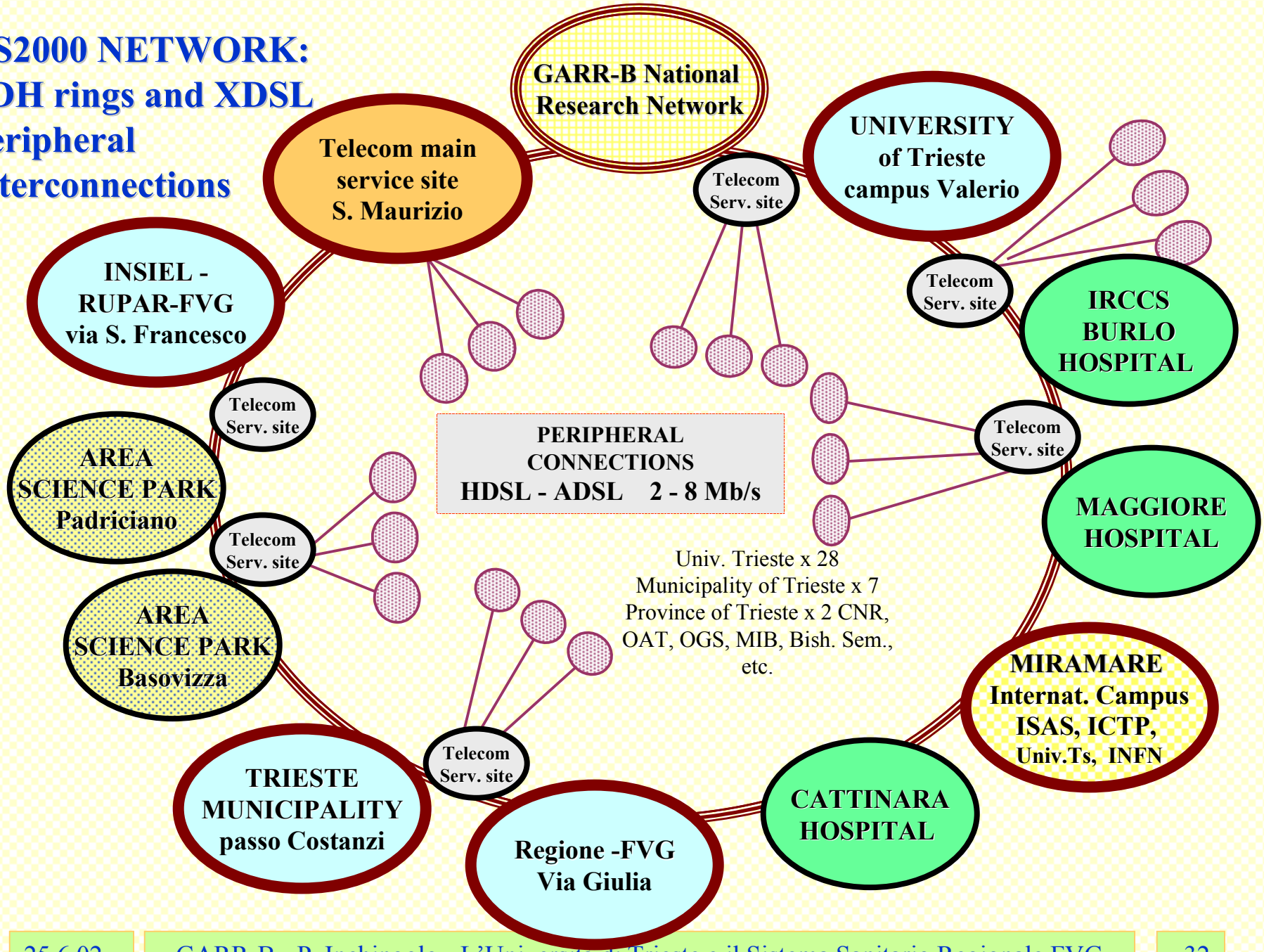
# TS2000 NETWORK: SDH rings & GbEth networks



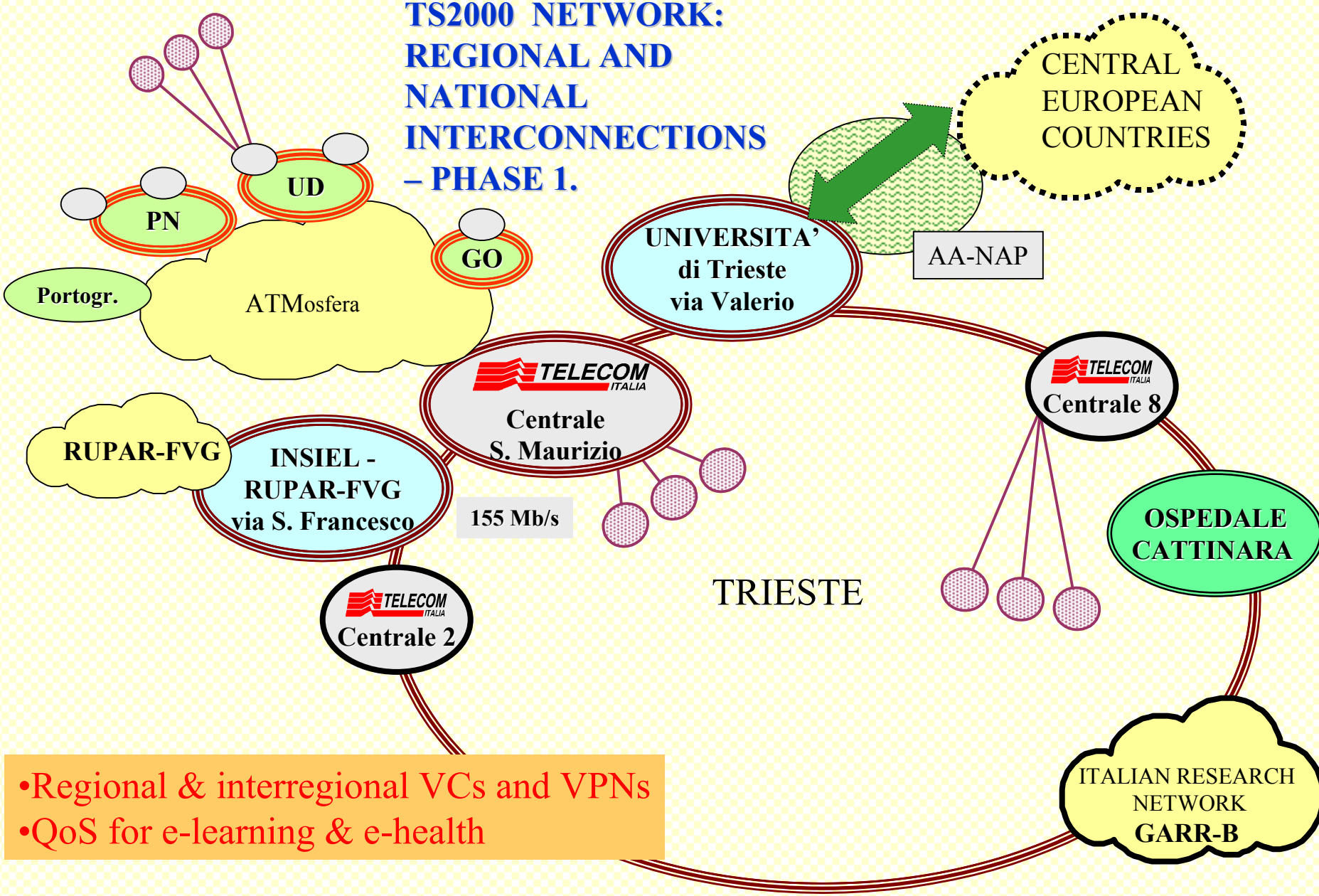
7 Optical-Fibers Rings
SDH 7x 622 Mb/s

34 Mb/s
GARR-B National Research Network
155 Mb/s
UNIVERSITY of Trieste campus Valerio
GigaBit-Eth O.F. networks
Telecom main service site S. Maurizio
28x155 Mb/s
INSIEL - RUPAR-FVG via S. Francesco
155 Mb/s
34 Mb/s
IRCCS BURLO HOSPITAL
34 Mb/s
AREA SCIENCE PARK Padriciano
34 Mb/s
MAGGIORE HOSPITAL
34 Mb/s
AREA SCIENCE PARK Basovizza
34 Mb/s
MIRAMARE Internat. Campus ISAS, ICTP, Univ.Ts, INFN
34 Mb/s
34 Mb/s
TRIESTE MUNICIPALITY passo Costanzi
34 Mb/s
Regione -FVG Via Giulia
34 Mb/s
CATTINARA HOSPITAL
GigaBit-Eth O.F. networks

# TS2000 NETWORK: SDH rings and XDSL peripheral interconnections

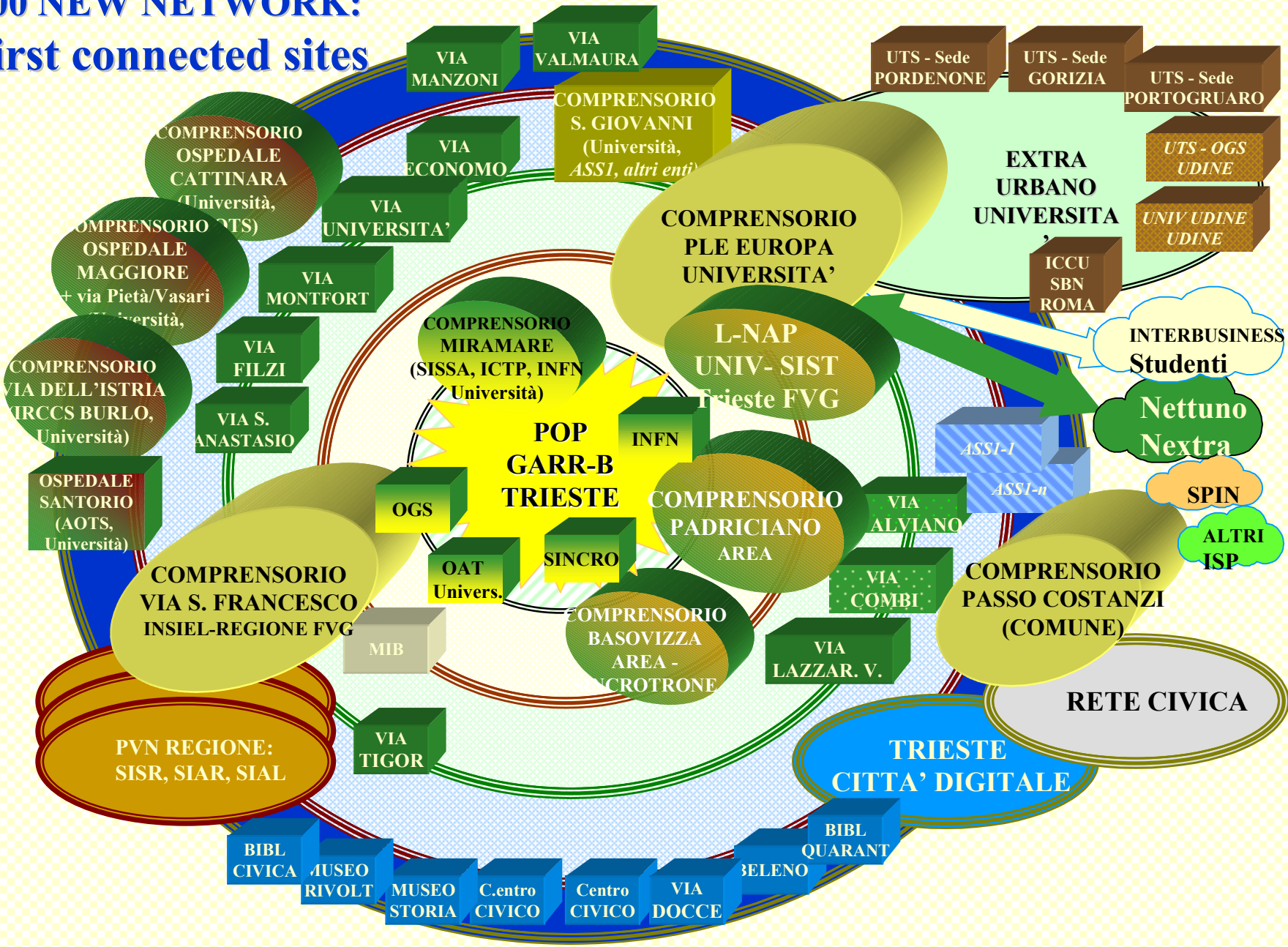


# TS2000 NETWORK: REGIONAL AND NATIONAL INTERCONNECTIONS – PHASE 1.




- Regional & interregional VCs and VPNs
- QoS for e-learning & e-health

# TS2000 NEW NETWORK: the first connected sites

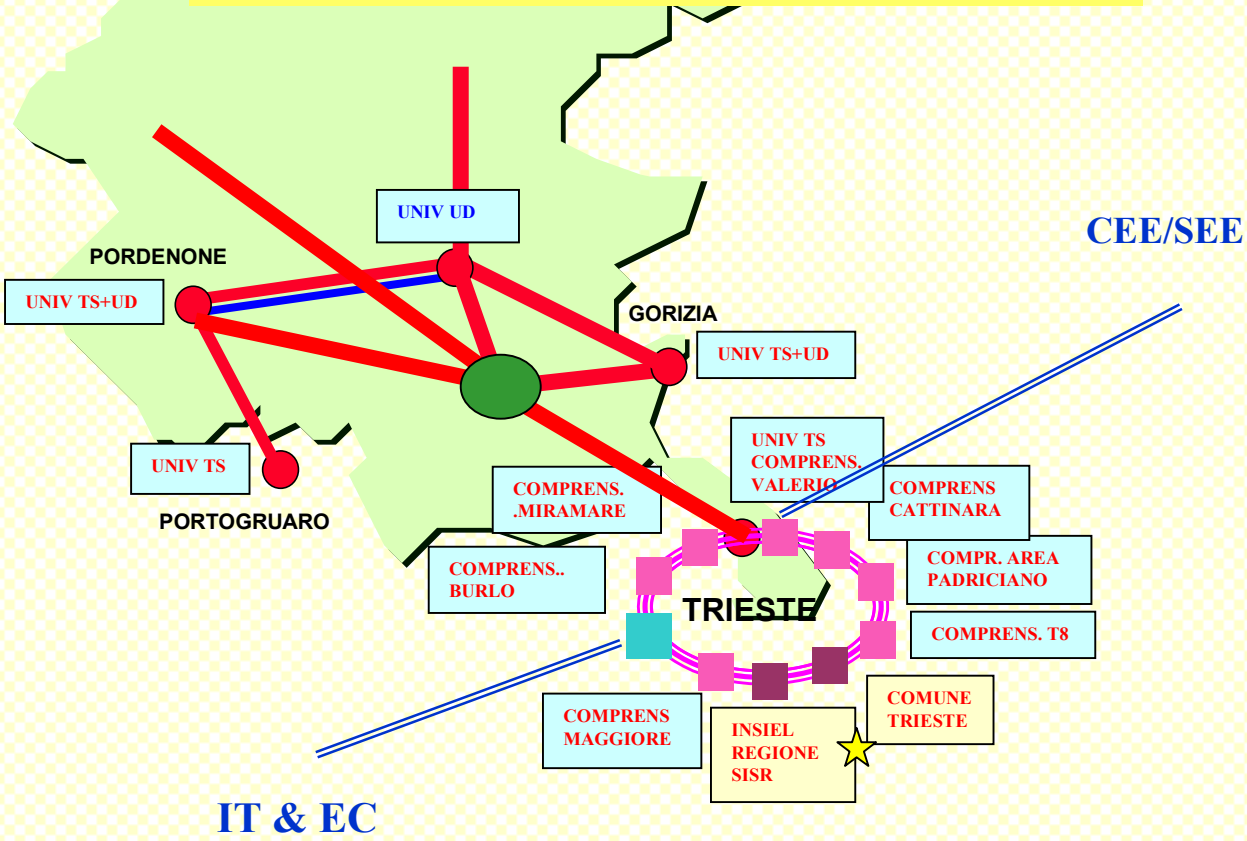


# Some of the services on the TS2000 TN (GARR-B PoReR WP 29) (many extended to Pordenone, Gorizia, Udine, Portogruaro)

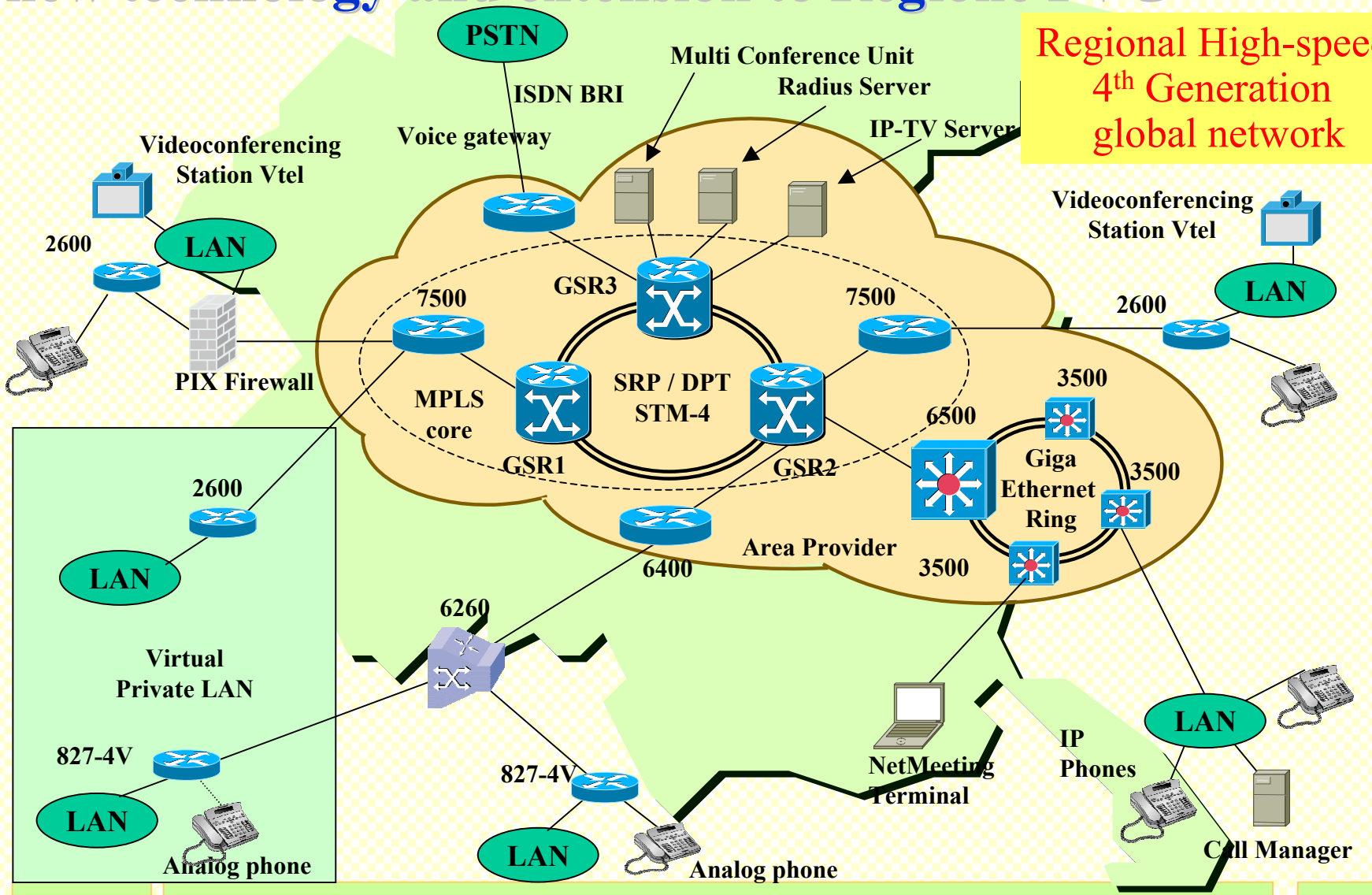
- collaborative research
- didatics (also high-school - university)
- administration of university, municipalities, hospitals, Area Science Park, research centers, etc.
- Health assistence global integration
- access ports to medical doctors and pharmacies
- health research
- intranet universal accesses
- full libraries' integration (SBN)
- support to S.M.E.s
- phone over ATM-VCs and over IP
- multi-teleconferencing over IP with streaming over intranet/internet
- tele-didatics
- tele-formation
- emergency monitoring and actions

# GARR-B PoReR WP29 – Regional Network Phase 2.

**Proprietary 34-155 Mbps Radio Bridges**
**+ O.F. channels**
**IP - MPLS network**

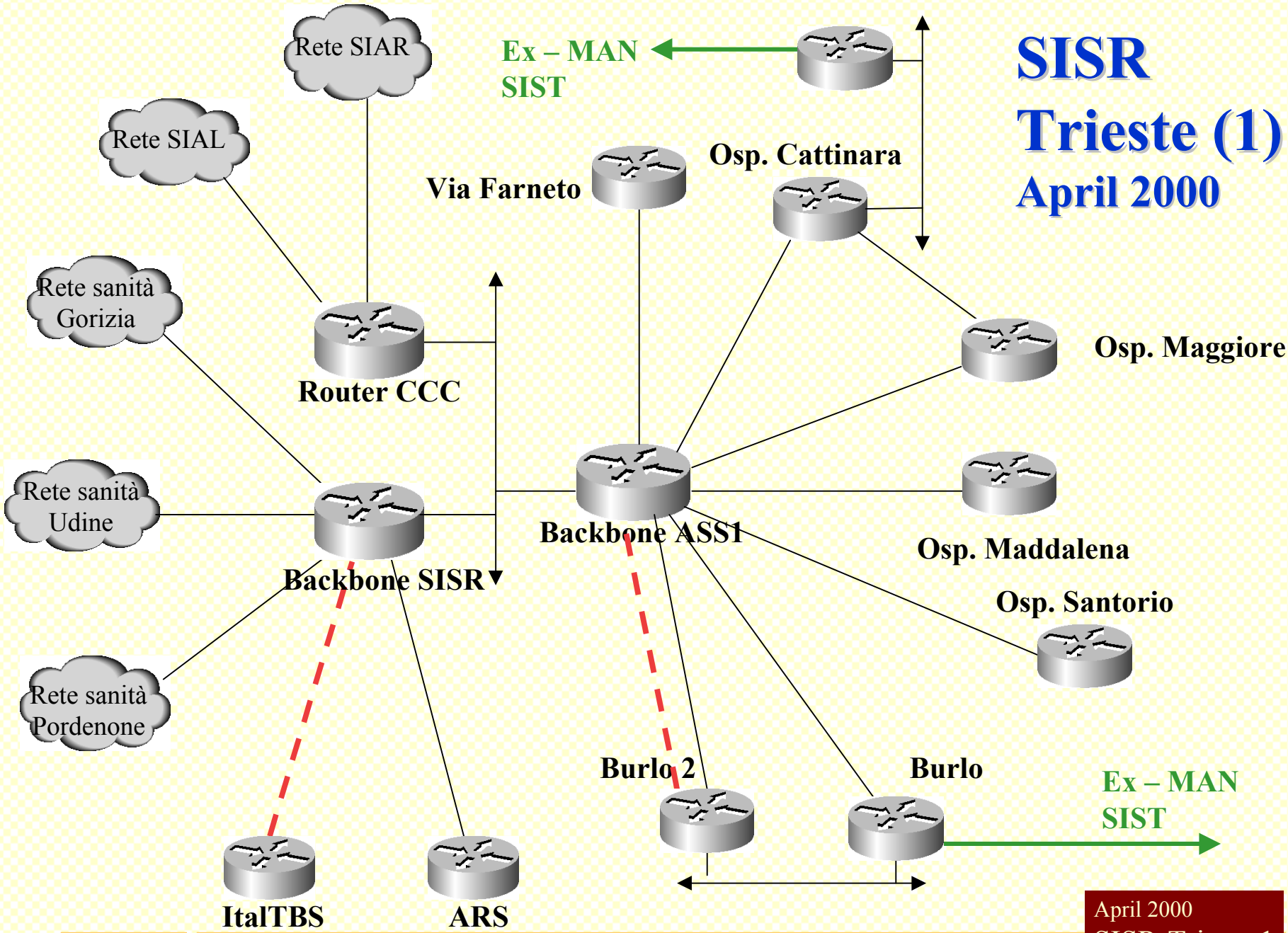


# GARR-B PoReR – Regional Network:
## new technology and extension to Regione FVG

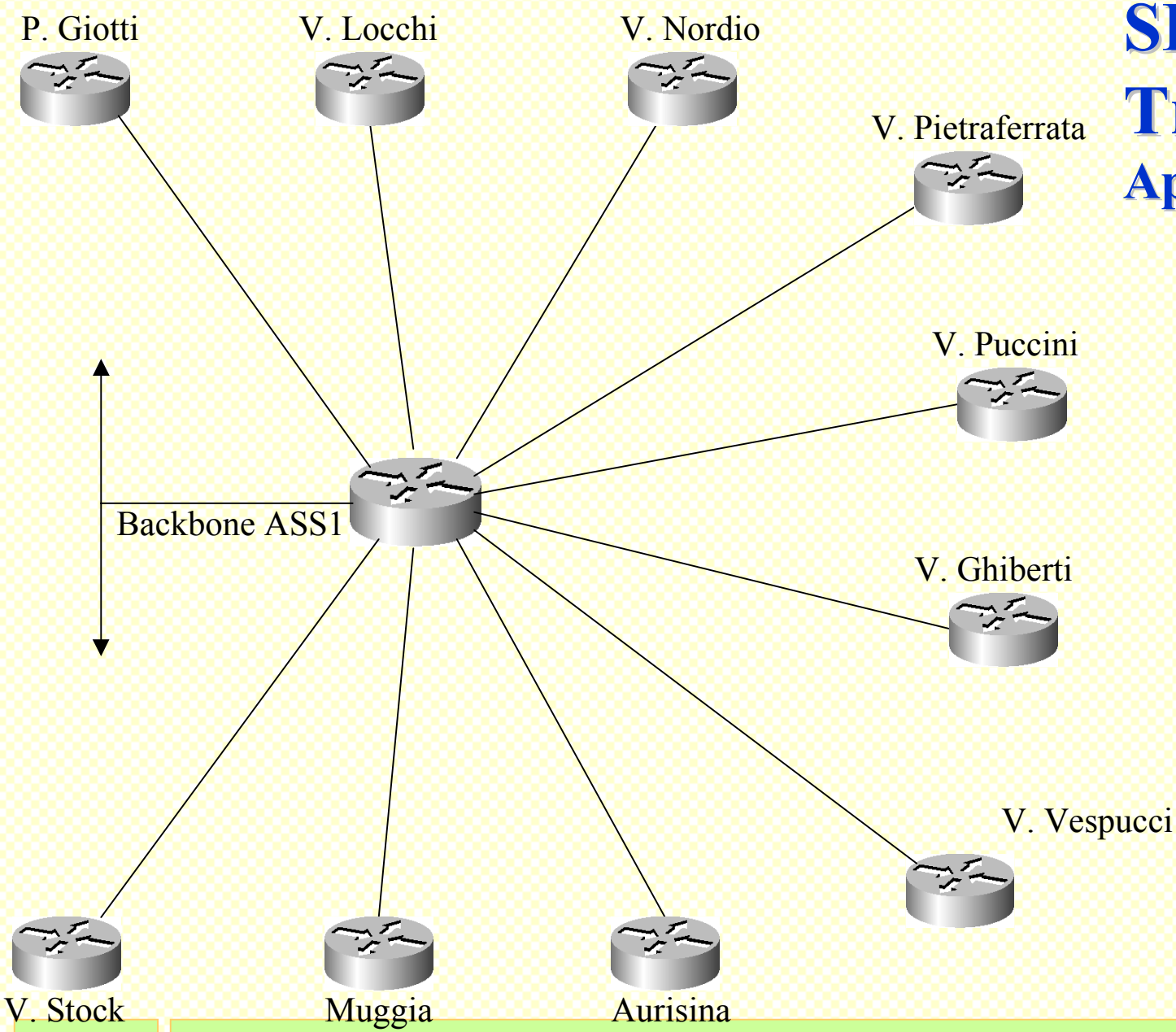



Regional High-speed
4th Generation
global network

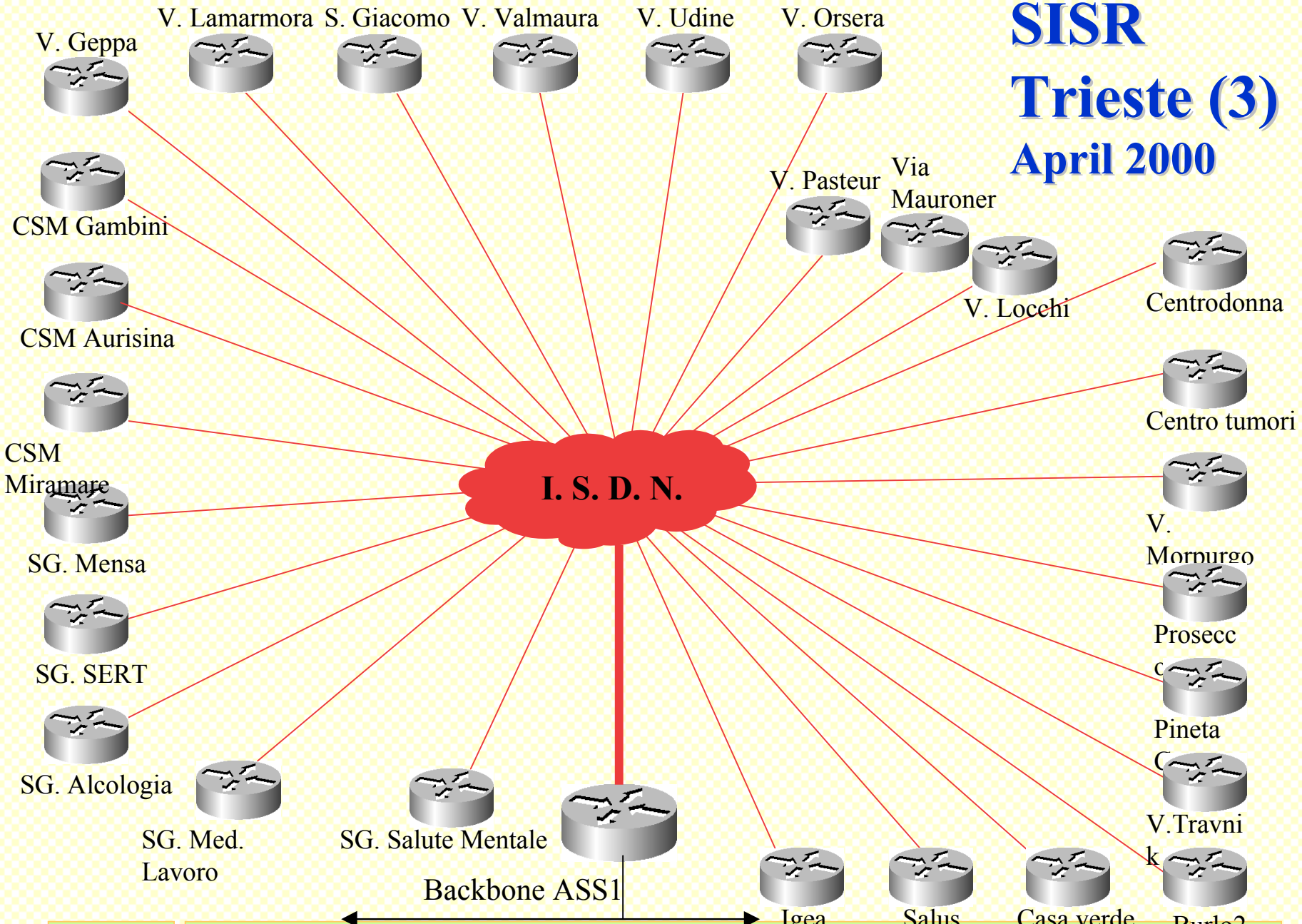
# SISR Trieste (1) April 2000



# SISR Trieste (2)
## April 2000



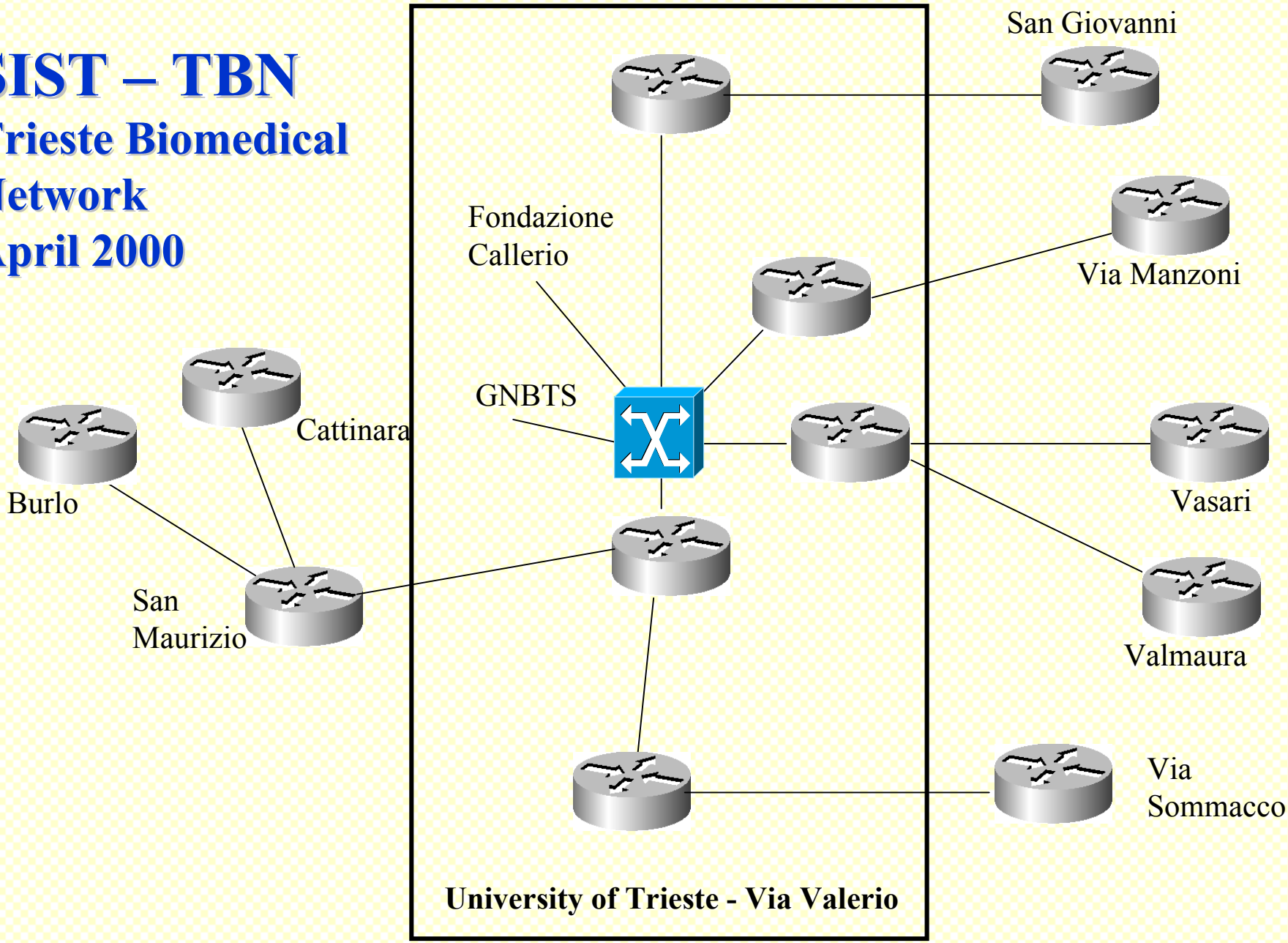
# SISR Trieste (3)
## April 2000



# SIST – TBN

## Trieste Biomedical Network

## April 2000

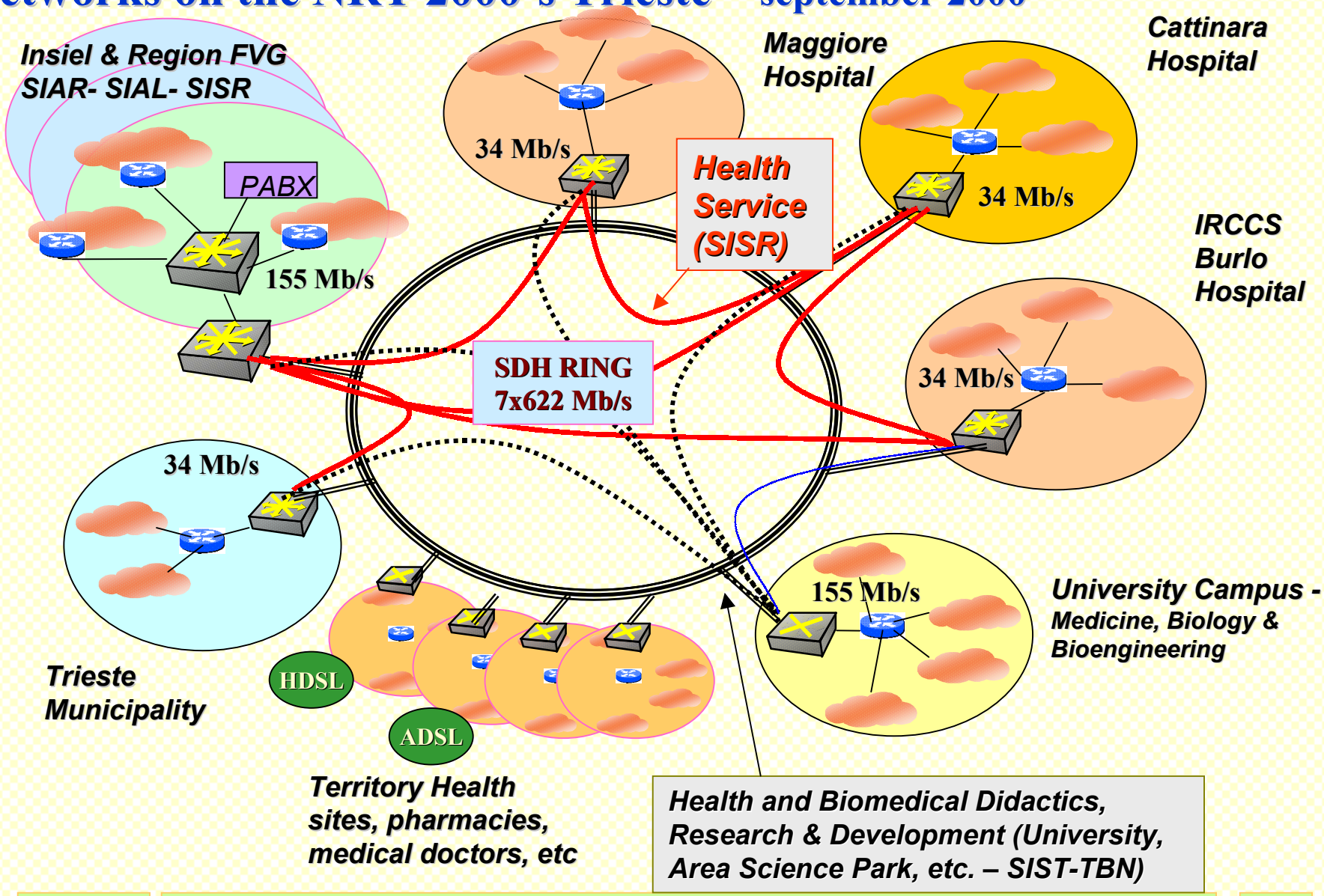


# From SISR + TBN-SIST to TPBN GARR-B PoReR WP29

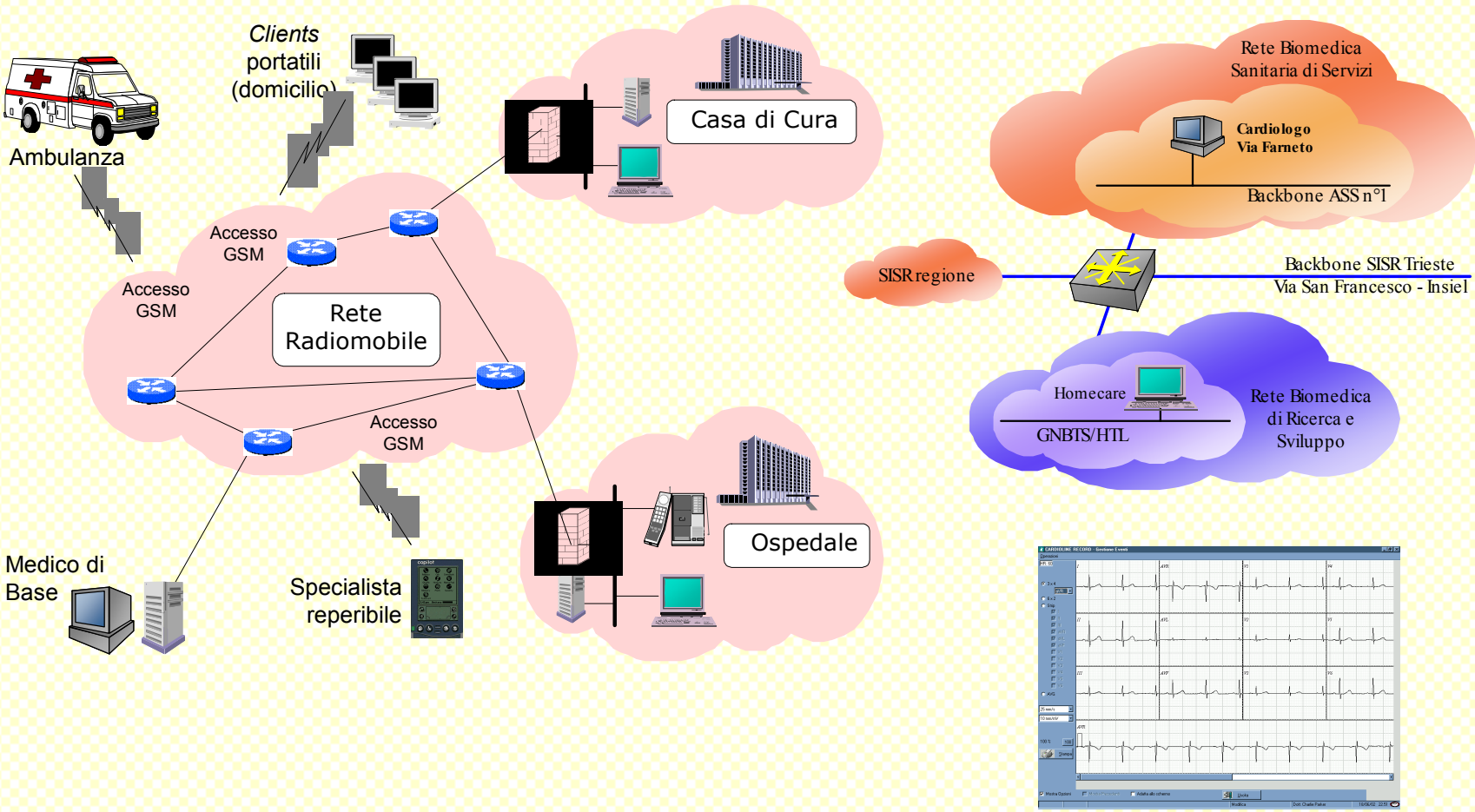
## the Trieste Protected Biomedical Network

| Institution - Subject | Function |
|---|---|
| University | Teaching + Research (+ Service) |
| Hospitals | Service (+ Research + Teaching) |
| Scientific Hospitals (IRCCS) | Research + Service (+ Teaching) |
| Research Institutions | Research (+ Service + Teaching) |
| Companies with agreements | Service (+ Teaching + Research) |
| Region + Health Regional Agency | Service [coord] (+ Research) |
| Citizens | Users of Service +Teaching |

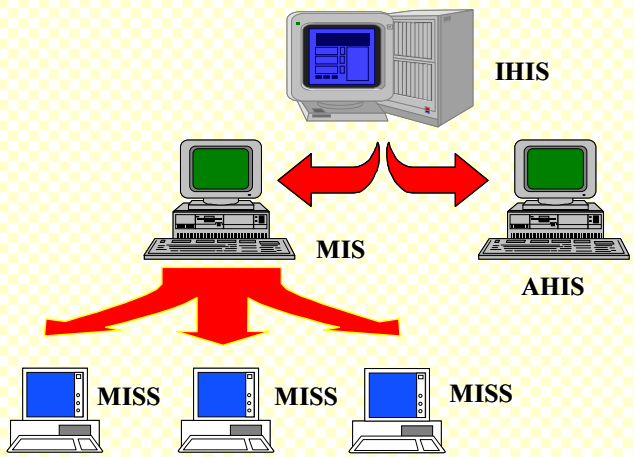
# TPBN GARR-B PoReR WP29: The protected biomedical networks on the NRT 2000's Trieste – september 2000



# TPBN: accesses from the territory



# DPACS-MedArcNet VI-EHR: the Virtual Integrator of the Electronic Health Records




**IHIS :**
**Integrated Hospital Information System**

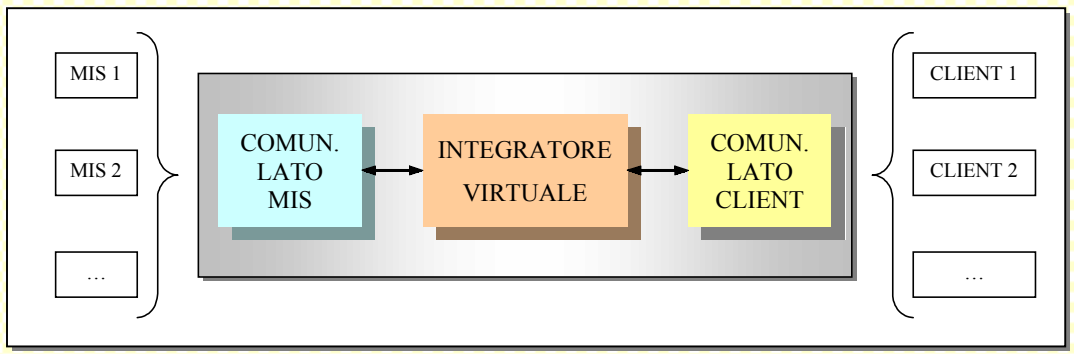
**AHIS :**
**Administrative Hospital Information System**

**MIS :**
**Medical Information System**

**MISS :**
**Medical Information Subsystem**

DPACS
University
Trieste

SPERIGEST
IFC-CNR
Pisa



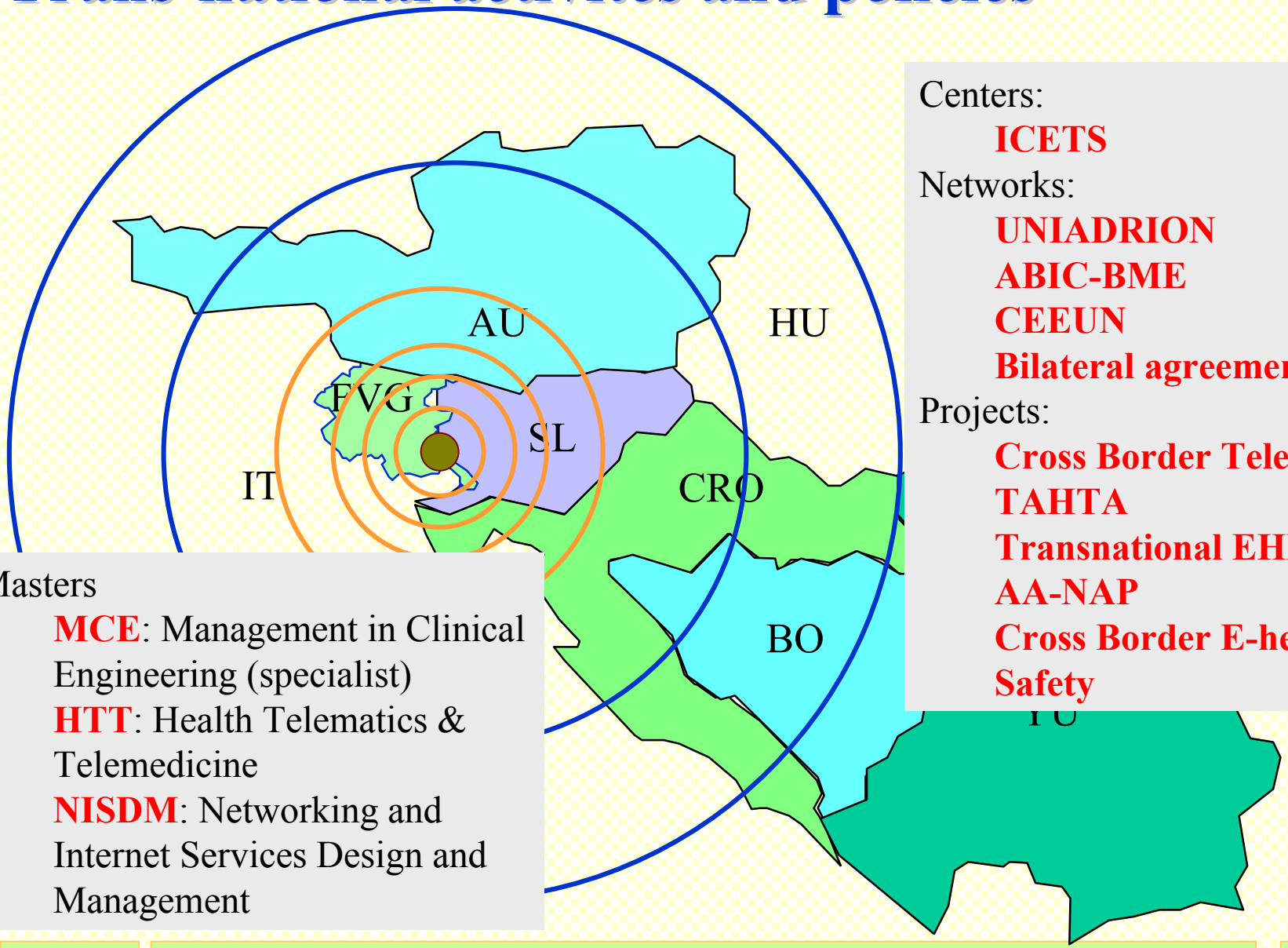
# REAL WILLING

## of all the involved Institutions of Trieste and Reg. FVG

## to constitute a SYSTEM

### by setting this one as the first goal for the future of the city and of the region as a bridge for the enlarged Europe

# Trans-national activites and policies




Centers:
- **ICETS**

Networks:
- **UNIADRION**
- **ABIC-BME**
- **CEEUN**
- **Bilateral agreements**

Projects:
- **Cross Border Telemed**
- **TAHTA**
- **Transnational EHR**
- **AA-NAP**
- **Cross Border E-health**
- **Safety**

Masters
- **MCE**: Management in Clinical Engineering (specialist)
- **HTT**: Health Telematics & Telemedicine
- **NISDM**: Networking and Internet Services Design and Management