

# GARR plans and open issues about connecting schools

TERENA Workshop:  
Connecting Schools to NRENs  
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G. Paolini – F. Ferri

# GARR Plans



# Structure of Education System in Italy

- ▶ **Primary** (~2650)
  - Length of program in years: 5
  - Age level from: 6 to: 11
- ▶ **Lower Secondary** (~1550 + ~3300 together with primary)
  - Length of program in years: 3
  - Age level from: 11 to: 14
- ▶ **Upper Secondary** (~3200)
  - Length of program in years: 5
  - Age level from: 14 to: 19
- ▶ **Total: ~10.700**

## Approved Project:

# Primary and lower secondary schools

- ▶ drawn up a summary agreement between GARR and MIUR (Ministry of Education, University and Research)
- ▶ First operating agreement (starting 2Q 2005) :
  - ~ 1000 primary and lower secondary schools to be connected
  - ADSL flat 1,2M/512K BGA (Granted Access Bandwidth): 128K/128K

Trial project:  
**Schools of Excellence**

- ▶ High level of knowledge in Information Technology, number of Personal Computers
- ▶ Upper secondary schools
- ▶ HDSL (2M-BGA: 1M) or leased lines or MAN via Universities
- ▶ ~ 100/200

# Access procedure



# A New Access procedure for GARR

- ▶ Low bandwidth links
  - HDSL and ADSL layer 2
  - ADSL layer 3 (via MPLS)
- ▶ Telco operators
  - Telecom Italia (incumbent)
  - Fastweb
- ▶ CPE
- ▶ Management

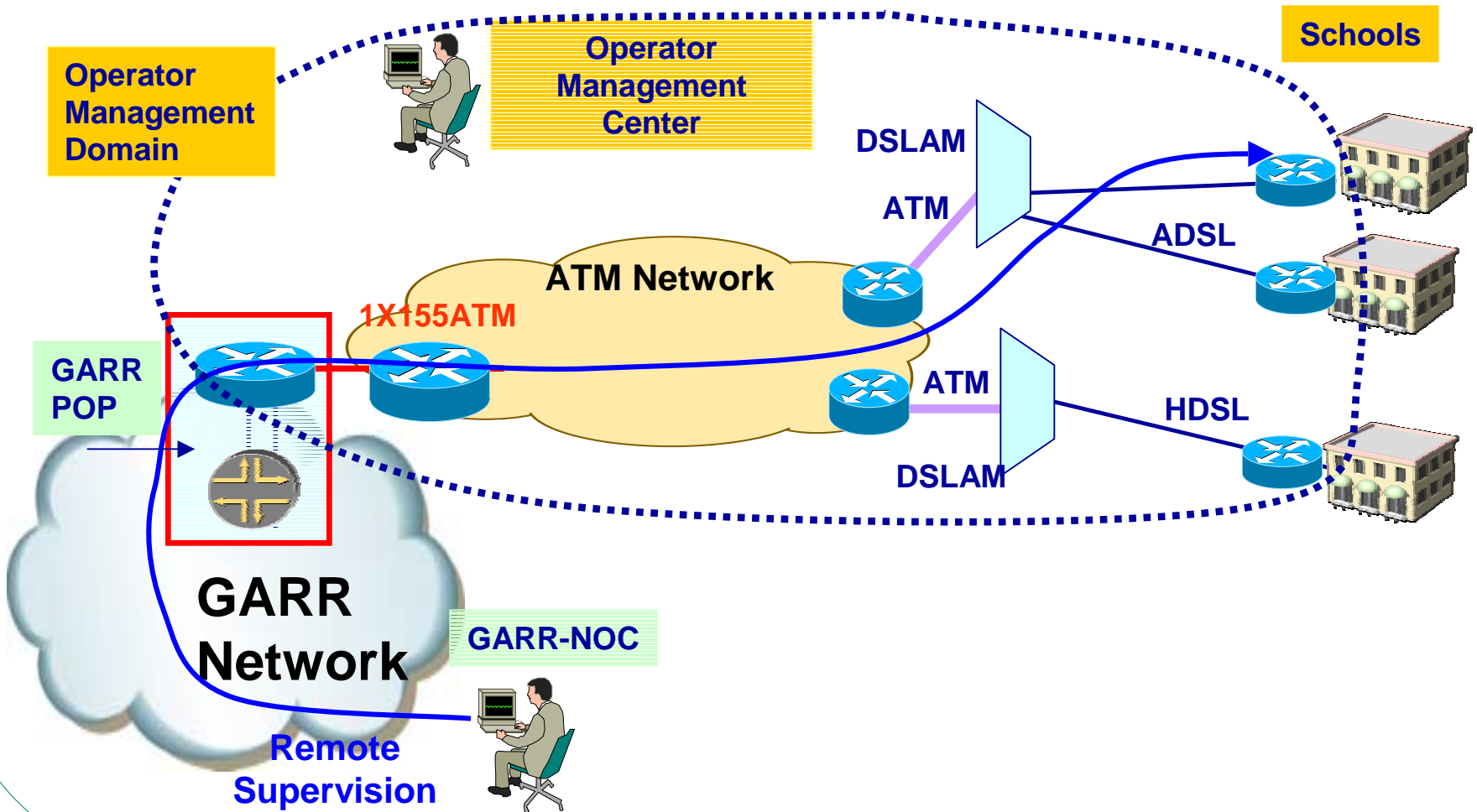
Access procedure :

# Connection model

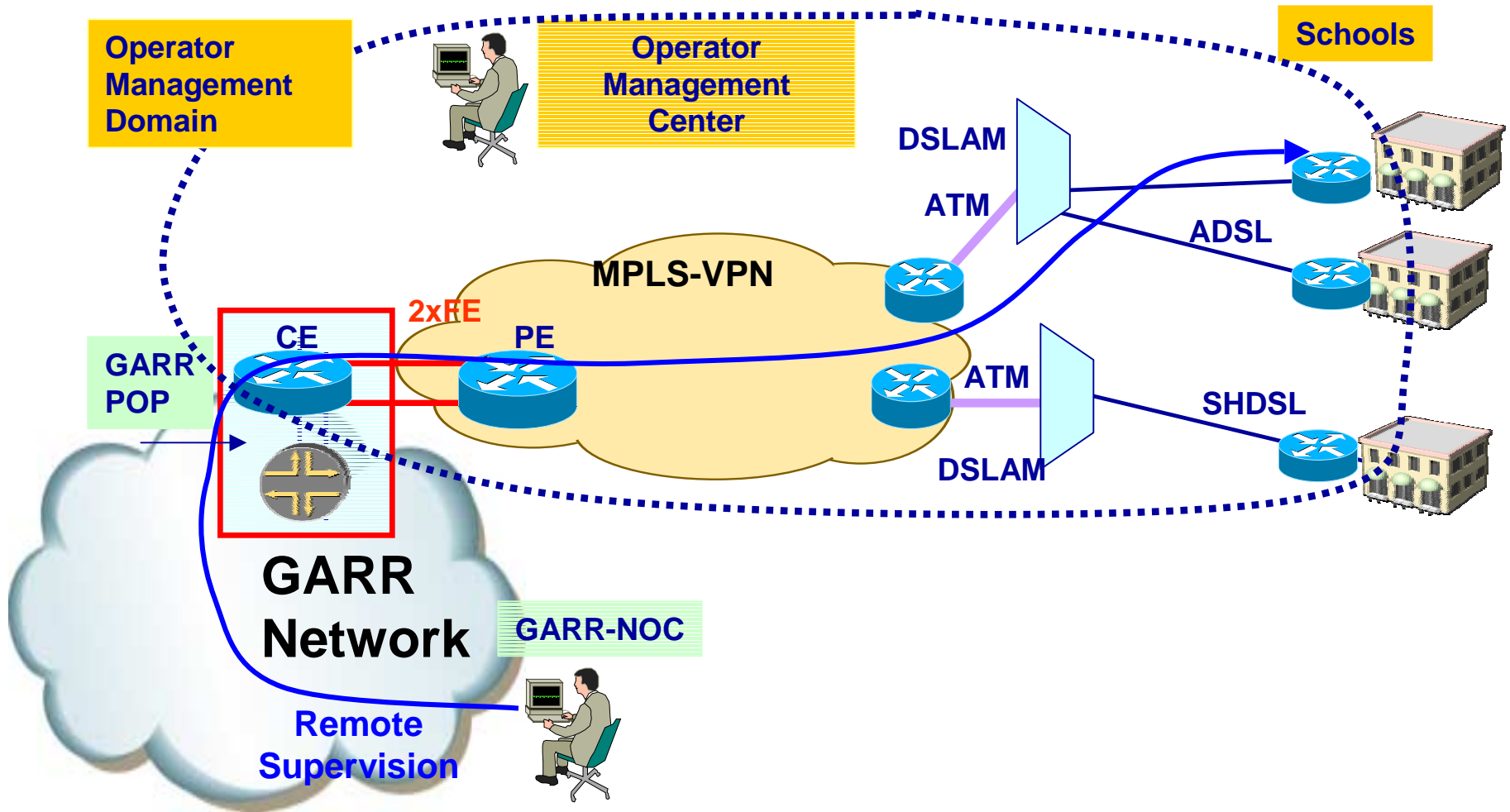
- ▶ HDSL and ADSL layer 2
  - Over ATM
  - guarantee across the whole path
  - Native IPv6 supported
- ▶ ADSL layer 3
  - Over MPLS
  - Without guarantee on Backbone
  - Cheap price



# Access procedure : Layer2



# Access procedure : Layer3



## Access procedure :

# Telco Operators

- ▶ Telecom Italia
  - Incumbent operator
  - proposal
    - HDSL and ADSL layer 2 'pay as you go' and flat
    - ADSL layer3 flat
  - “whole” Italy cover
- ▶ Fastweb
  - proposal
    - ADSL and SHDSL layer3 flat
  - Partial cover (~160 city areas)

## Access procedure :

# CPE

- ▶ Closed box, low management
- ▶ Firewall, NAT, DHCP
- ▶ IPv6 ready
- ▶ SOHO series evaluation  
(small office home office)
  - CISCO
  - JUNIPER

## Access procedure : Management

- ▶ GARR IP address Plan
- ▶ Customer management moved to Telco operator
- ▶ NOC GARR only for escalation and supervision
- ▶ CPE agreed configuration

# Other projects



Approved Projects :

# HSH@Network (Hospital-School-Home)

- ▶ long-term patient students
- ▶ e-learning using videoconference
  - 65 hospital to be connected
    - 5 already connected
    - 14 being carried out
    - Others: waiting for LAN
  - HDSL 2M – BGA: 1Mb 'pay as you go'

## Approved Projects :

# EmilyLink

- ▶ Agreement with Ufficio Scolastico Regionale-Emilia Romagna School Regional administrative office
- ▶ Videoconference between teachers
  - 10 premises
    - 9 schools (one for areas)
    - IRRE-ER
  - HDSL 2M – BGA: 1Mb 'pay as you go'



# Open Issues



## Open Issues :

# IPv6

## IPv6 versus Low Cost Solution!

- ▶ Connection model
  - Layer 2 (IPv6 and IPv4 over L2; dual stack)
  - MPLS (6PE)
- ▶ Customer Premise Equipment
  - All in a “box”: ready to use / easy to use
  - IPv6 ready

## Open Issues :

# IPv6

- ▶ Users without experience with simple needs
  - (web, mail, videoconference ?)
- ▶ Microsoft OS: IPv6 needs to be installed
  - No graphic interface
- ▶ Low level of security
- ▶ School user similar to home user
  - Academic user was an enhanced user: no IPv6 gap

## Open Issues :

# Customer Relationship Management

- ▶ How to define the border?
- ▶ White papers, guides (LAN, WAN, Security, Management, DNS, MAIL, WEB server?)
- ▶ Training

## Open Issues : NOC tools

- ▶ How to continue using Open source tools?
- ▶ Alarms (with and without pro-activity?)
- ▶ Monitoring (traffic statistics)
- ▶ Reports (95 percentile)

## Open Issues : Security

- ▶ Firewall configuration. how strict?
- ▶ Where is the border?
- ▶ Virus protection.

## Open Issues :

# Advanced services

- ▶ Videoconference: one head MCU ?
- ▶ Multicast ?
- ▶ VoIP ?

## Open Issues :

# NRENs Collaboration

- ▶ How to connect schools in a foreign country?
- ▶ Collaboration between NRENs
- ▶ Foreign schools = local schools





[planning@garr.it](mailto:planning@garr.it)

[paolini@garr.it](mailto:paolini@garr.it)

[ferri@garr.it](mailto:ferri@garr.it)