



Strategies to Minimise Broadband Access Roll-out Risk in Rural Areas

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Summary

- Discussion about how recent radio and copper technologies can be used to deploy broadband access in rural areas
- Context: Spanish Ministry of Industry Broadband Extension Program
- Different available technologies, access architectures and strategies to fulfil with the extension program are described.
- Finally, some broadband access services in rural areas and their applications are enumerated



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- Introduction: present situation
- Spanish rural broadband extension program
- A comparison of available broadband access technologies
- Rural broadband scenarios and architectures
- Deployment Strategies
- Rural Broadband Services and Applications
- Conclusions



Introduction: Present Situation

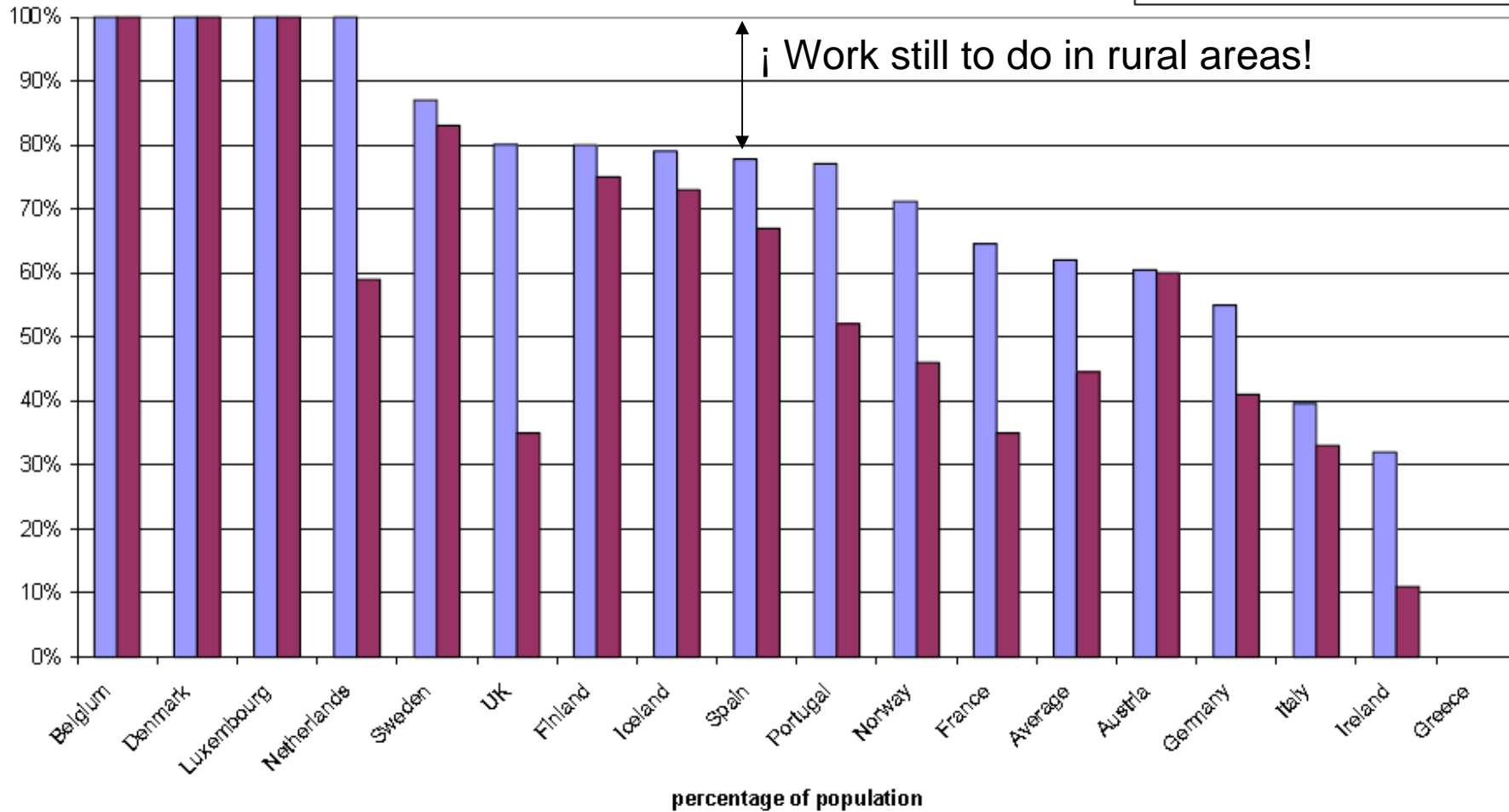
- **Stimulate broadband access demand is one of the main European Union priorities** to promote economical development
- **Good coverage of broadband** access exists, **but demand is still low** in many European countries
- Actions are being taken to **stimulate the use of broadband access services** in public administrations, schools, town councils, libraries, etc. Some European countries apply also a reduction in taxes for citizens hiring these services
- Also, actions to **extend coverage of broadband access technologies in rural and isolated areas** are being taken, to reduce the digital gap between European regions
- **The case of Spain:** 40% of municipalities (1,4 million people) with an offer of broadband services inferior to the one found in urban areas



DSL Coverage in Rural Areas per European Country

DSL coverage in rural areas January 2004-2005

■ January 2005 ■ January 2004

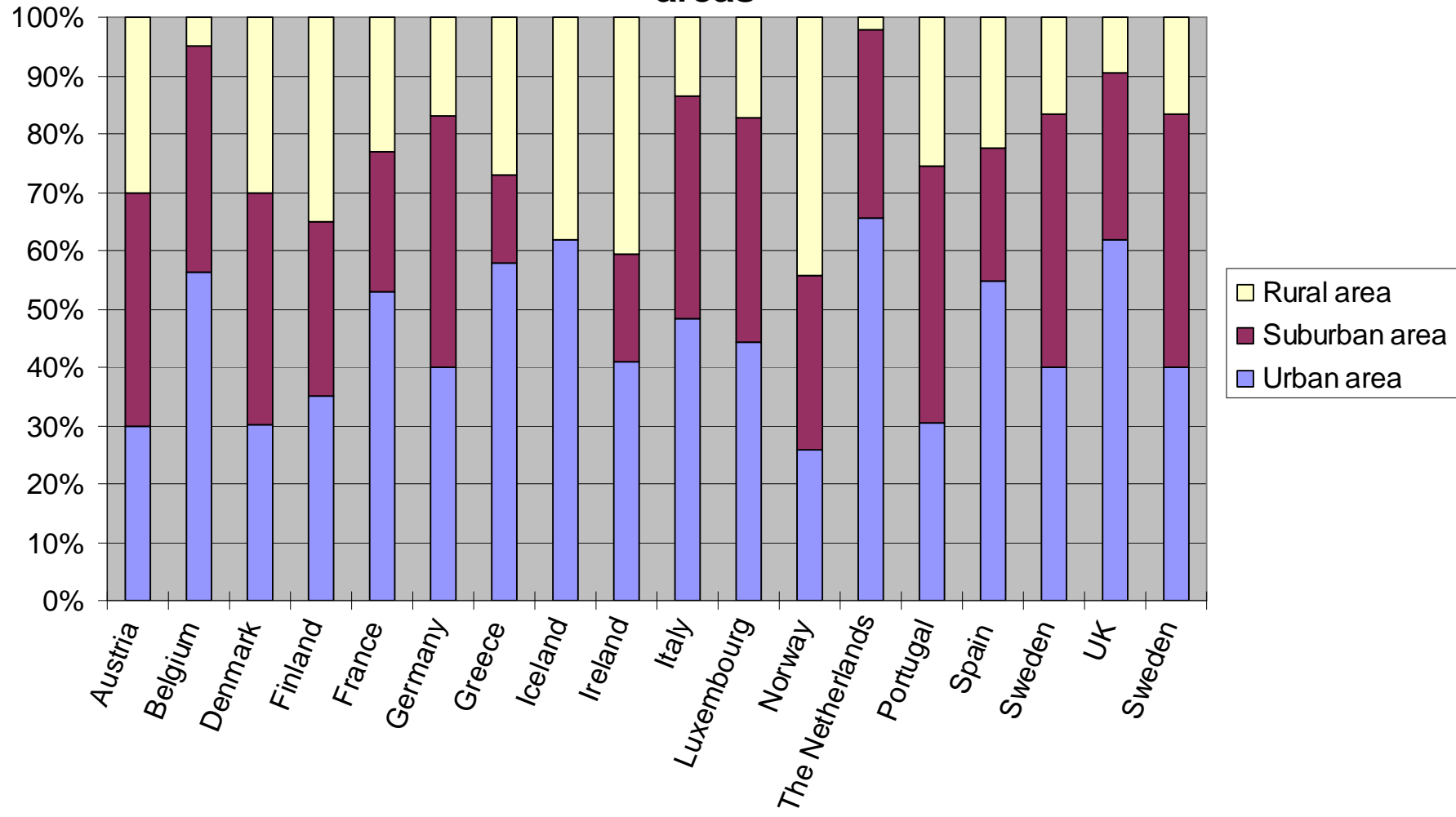


Source: Digital Divide Forum Report

2006 Athens



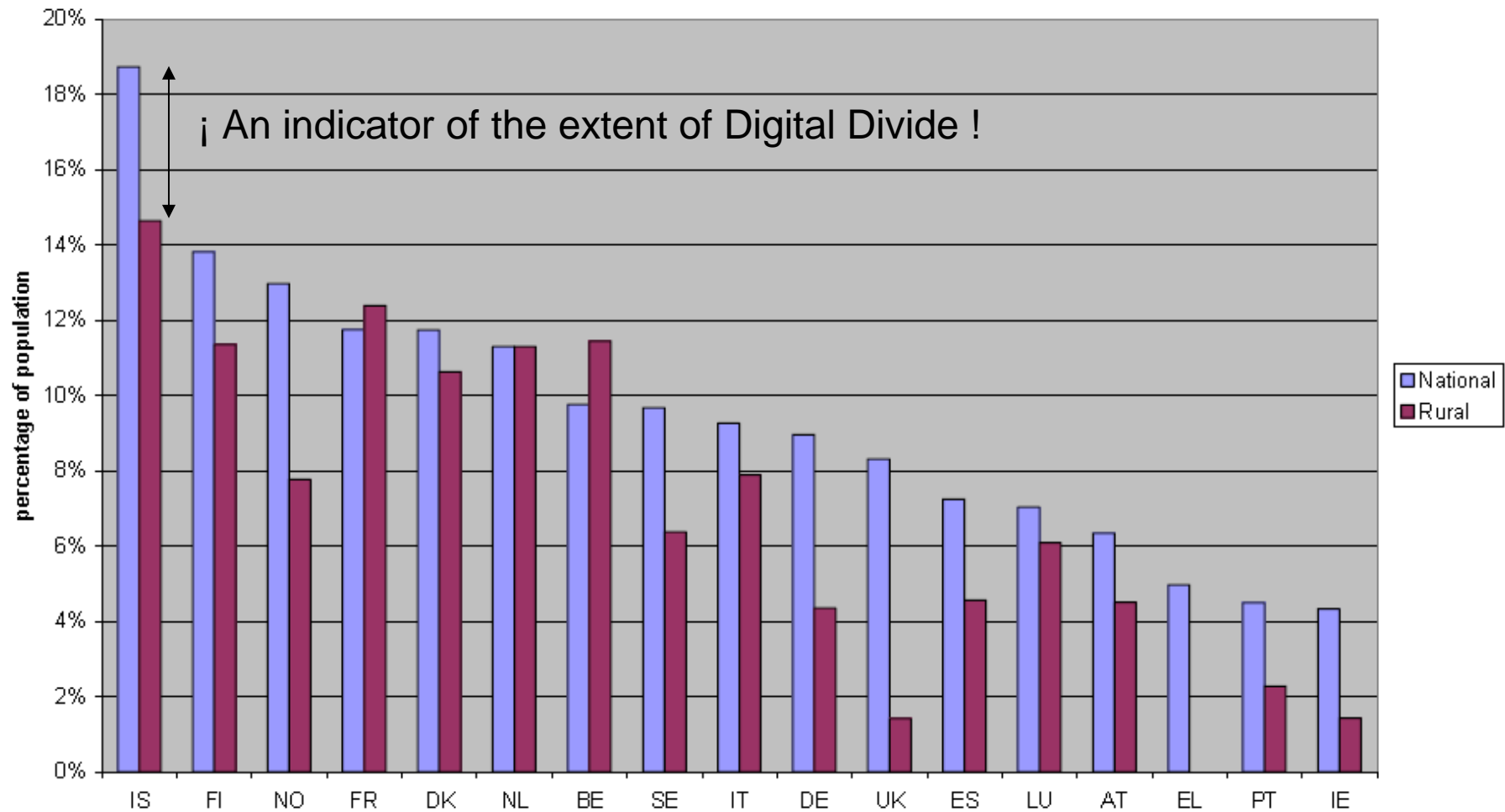
percentage of population residing in urban, suburban and rural areas





DSL Services Take-up

DSL Penetration/Coverage ratio per country (January 2005)





Spanish Rural Broadband Extension Program (1)

- Launched by **Spanish Ministry of Industry** in **May 2005** to **extend coverage of broadband access services in rural areas**
- **Public tender, winner operators will receive European and Spanish funds** to subsidize part of their investments in network infrastructures to extend coverage in the next four years
- Offered funds (not surpassing 30% of the investments) are composed of: **credits without interest and non returnable funds**
- **Criteria to select winner proposals:** services comparable to those found in urban areas, the greater coverage with the less investments, the best technological solutions, deployed infrastructures must be shared with the rest of telecommunication operators
- 2,5 million people will benefit from the program



Spanish Rural Broadband Extension Program (2)

Programa Nacional de Extensión del Acceso a la Banda Ancha en Zonas Rurales - Página Principal - Microsoft Internet Explorer

Archivo Edición Ver Favoritos Herramientas Ayuda

Dirección: <http://www.bandaancha.es/>

Atrás Búsqueda Favoritos

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PROGRAMA NACIONAL

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Documentación Técnica

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Enlaces de Interés

ZONA PRIVADA

Comité de Seguimiento

DATOS SOBRE DISPONIBILIDAD DE ACCESO EN EL MARCO DEL PROGRAMA NACIONAL DE EXTENSIÓN DE LA BANDA ANCHA

Consulta de las áreas (zonas de aplicación) con disponibilidad de servicio de Banda Ancha en el marco de las actuaciones del Programa Nacional.

[\(+Información\)](#)

PROGRAMA NACIONAL DE EXTENSIÓN DE BANDA ANCHA EN ZONAS RURALES Y AISLADAS

Este Programa está orientado a la concesión de ayudas a operadores de telecomunicaciones para promover la cobertura de banda ancha (BA) en zonas rurales y aisladas. Dichas ayudas están dirigidas a incentivar inversiones adicionales – por parte exclusiva de los operadores de redes- al objeto de extender la cobertura del acceso de banda ancha con condiciones similares a las disponibles en las zonas urbanas: a las áreas donde actualmente no existe tal oferta. Dichas áreas contemplan especialmente zonas rurales y zonas industriales y residenciales alejadas de los núcleos urbanos.

[\(+Información\)](#)

PROYECTOS DEL PROGRAMA NACIONAL DE EXTENSIÓN DE BANDA ANCHA EN ZONAS RURALES Y AISLADAS

Los proyectos ya han sido seleccionados en este Programa en 2005. Se trata de proyectos de despliegue que superan requisitos técnicos mínimos y cumplen las condiciones de precio requeridas.

[\(+Información\)](#)

NOVEDADES

Próxima Resolución del Concurso para Terra Chá y Foz (Galicia).



Comparison of Broadband Access Technologies

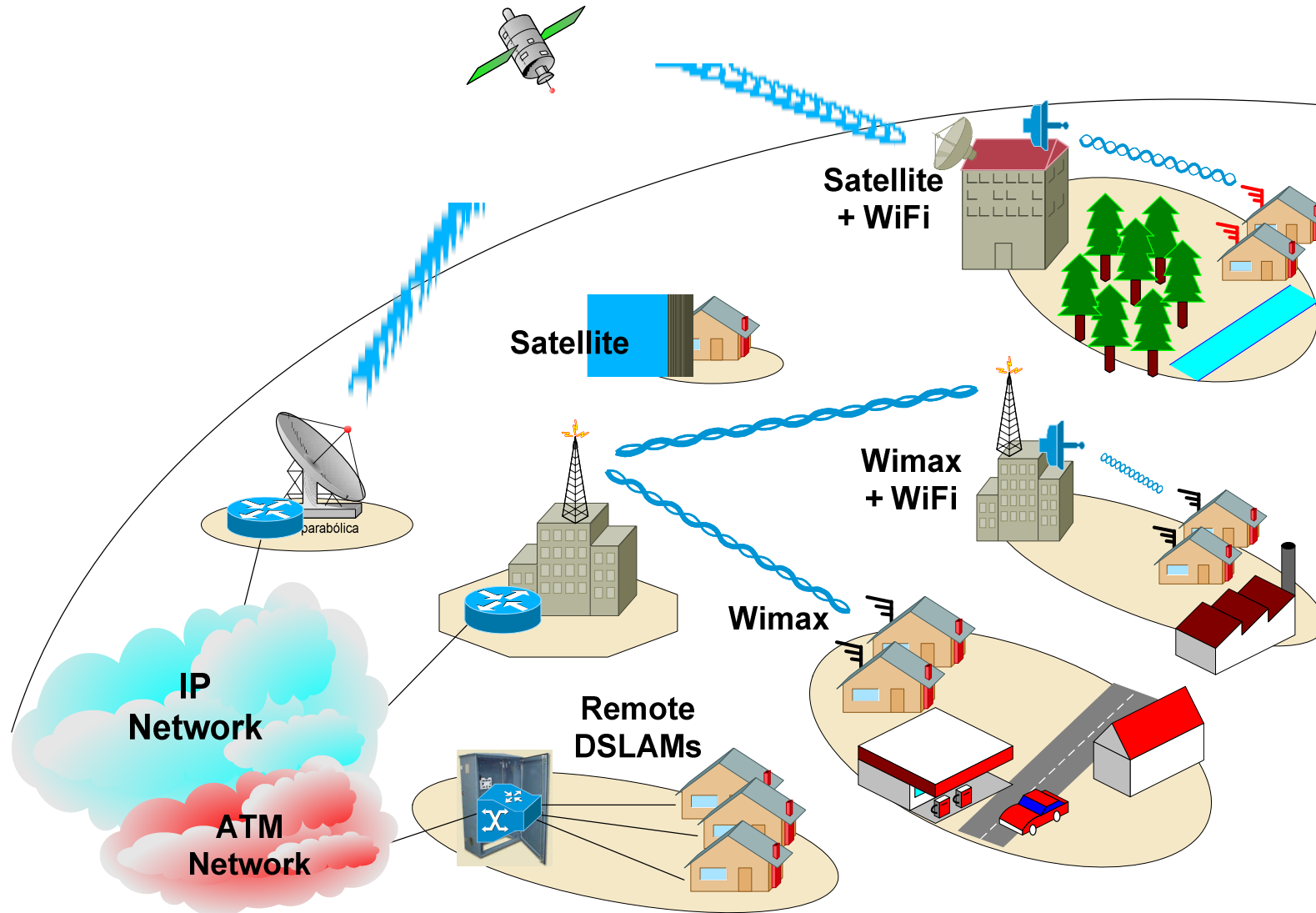
	xDSL	WiMax	Satellite	WiFi
Area of Coverage	Dark Red	Red	Dark Red	Light Pink
Capacity and Quality of Service	Dark Red	Red	Dark Red	Light Pink
Existence of Standards	Dark Red	Dark Red	Light Pink	Red
CAPEX and OPEX in Client Side	Dark Red	Dark Red	Light Pink	Red
CAPEX and OPEX in Network Side	Light Pink	Dark Red	Dark Red	Red
Risk of Deployment and Obsolescence	Dark Red	Dark Red	Light Pink	Red
Security	Dark Red	Dark Red	Red	Light Pink
Services that can be Deployed	Dark Red	Red	Dark Red	Light Pink
Easiness of Deployment (client side)	Dark Red	Light Pink	Dark Red	Red
Easiness of Deployment (network side)	Light Pink	Dark Red	Dark Red	Red



← Better Worse



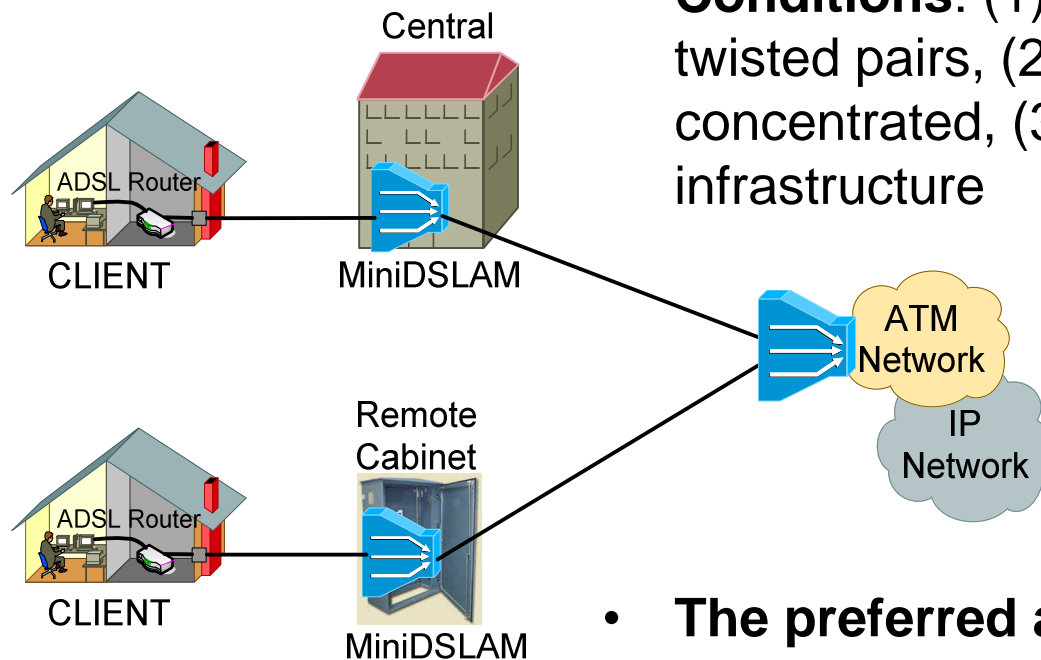
Rural Broadband Access Architectures





xDSL Rural Broadband Access Architectures

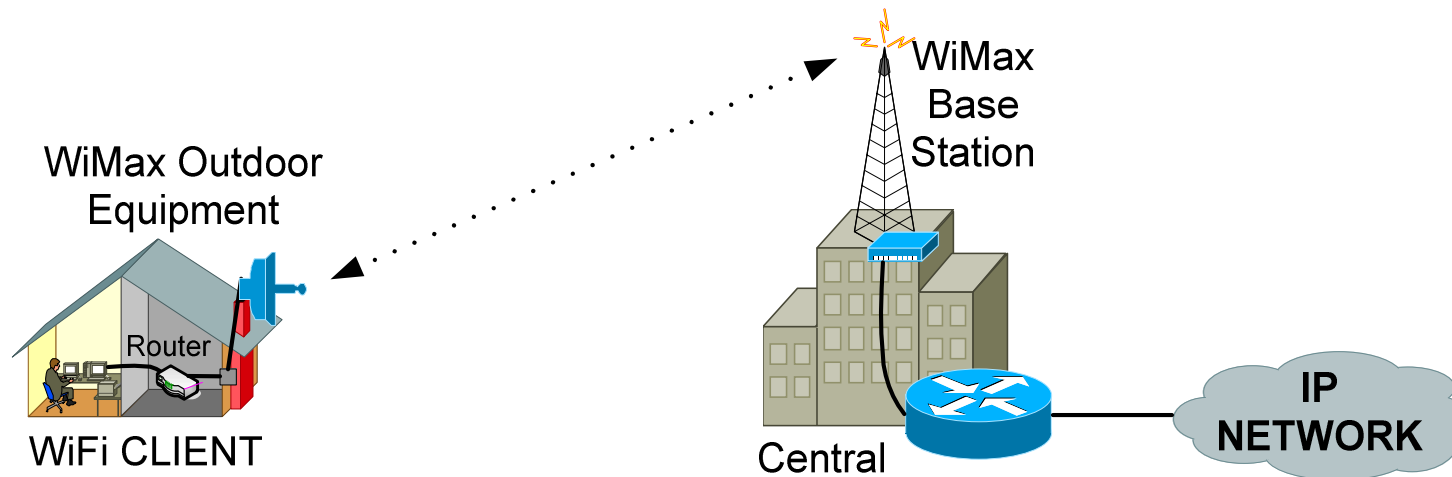
- Deploy **remote DSLAMs in outdoor cabinets** connected to the ATM or IP network by terrestrial links
- **Conditions:** (1) existence of suitable copper twisted pairs, (2) demand sufficiently high and concentrated, (3) existence of previously deployed infrastructure



- **The preferred architecture:** a great part of the infrastructure can be amortised in 20 years and can be shared by other applications
- A very wide range of services can be offered



WiMax Rural Broadband Access Architectures

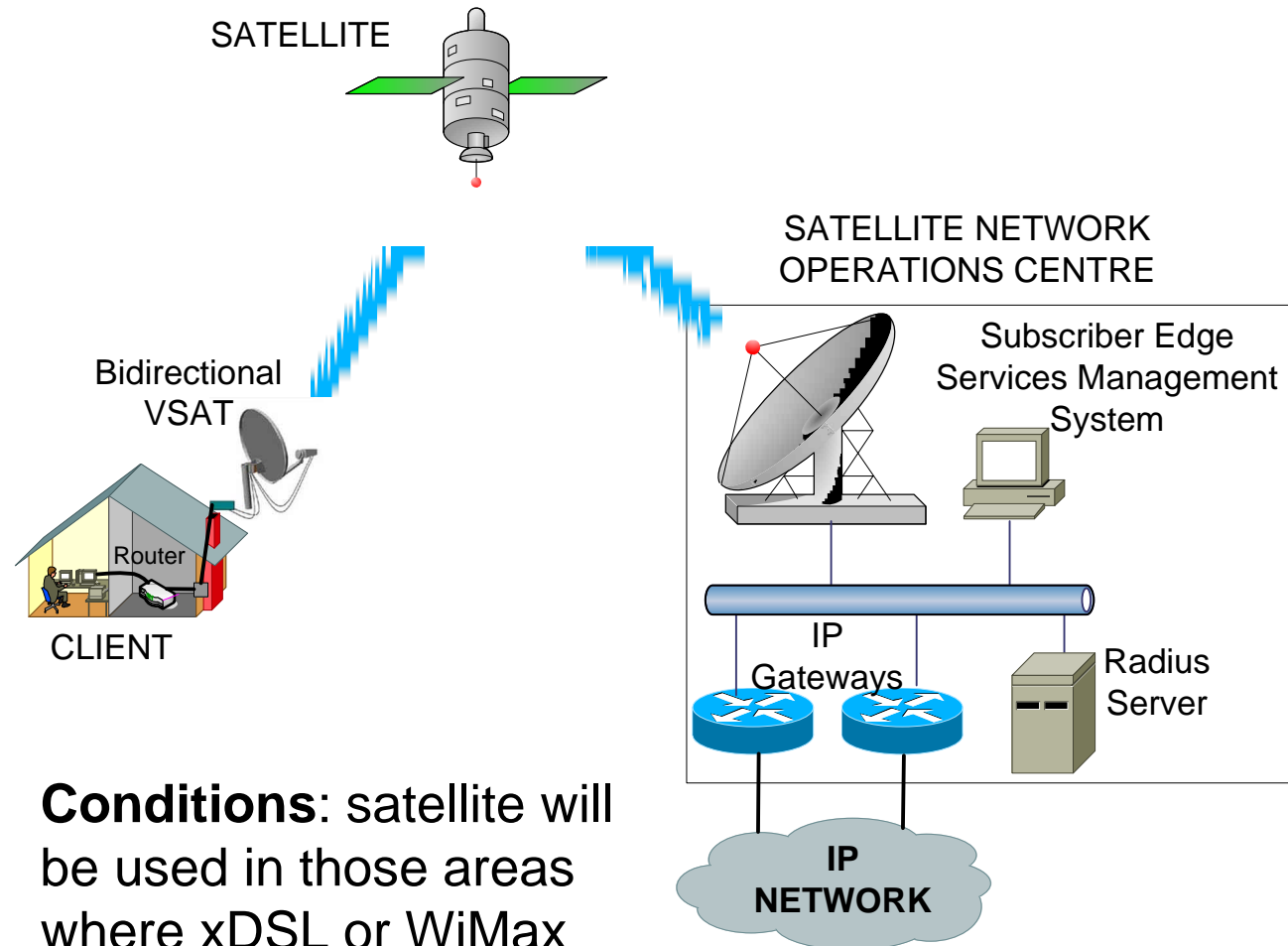


- **WiMax base stations located at strategic points** (15 km LOS, 3 km NLOS). Base Stations connected to the IP network by a terrestrial or radio link. Outdoor and indoor equipment at client side at the beginning
- **Conditions:** (1) copper twisted pairs not suitable, (2) lack of deployed infrastructures, (3) demand dispersed over relatively wide area, (4) LMDS base stations or other radio infrastructures exist, (5) expected demand: enterprises, city councils, schools, etc



Satellite Rural Broadband Access Architectures

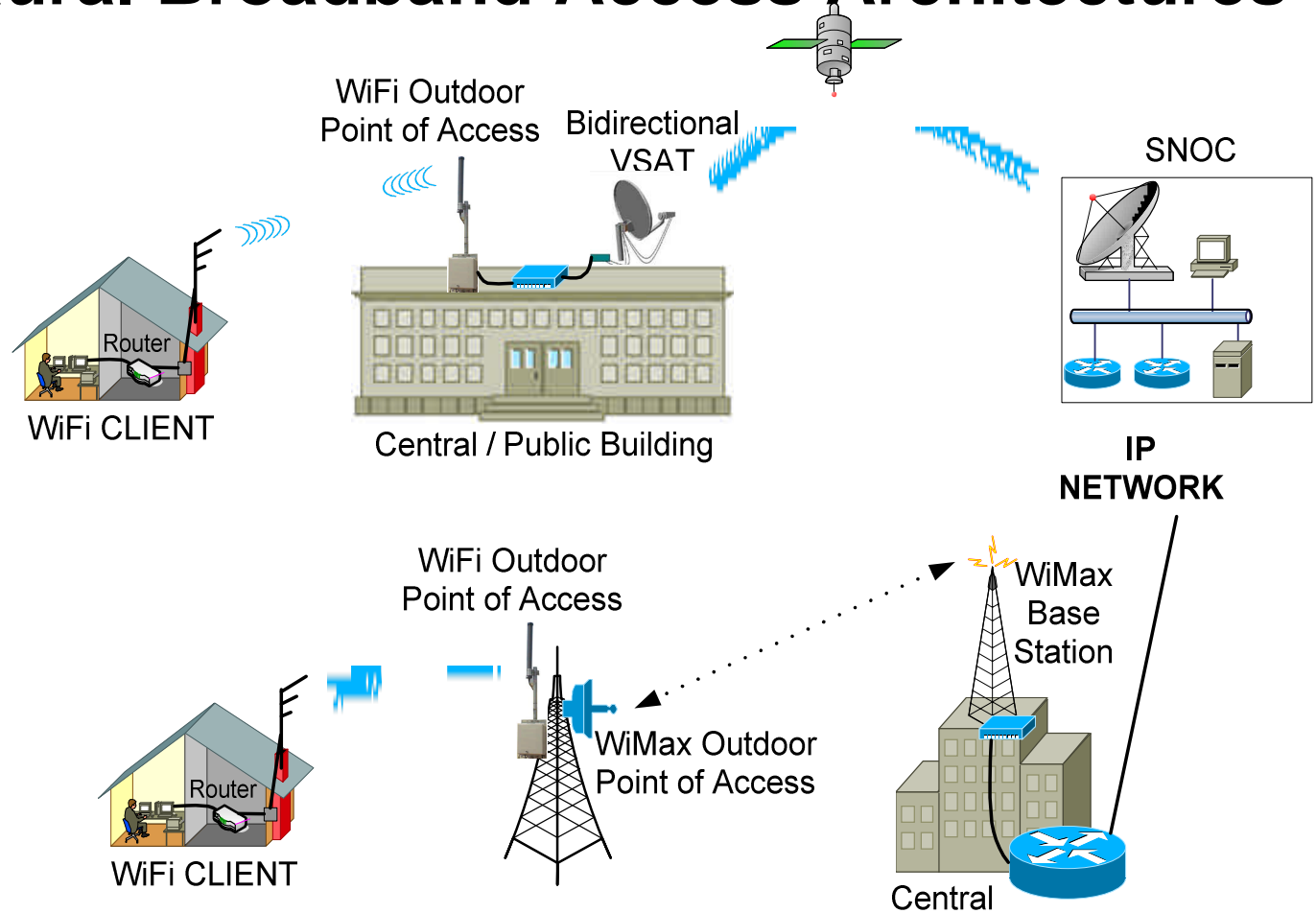
- A **transponder** in a satellite must be hired and a **Satellite Operations Centre (SOC)** must be deployed.
- This will have the antennae to reach the end users via the satellite and **IP gateways** to control QoS and traffic of the different users.



- **Conditions:** satellite will be used in those areas where xDSL or WiMax cannot be economically deployed.



Hybrid WiFi Rural Broadband Access Architectures





Deployment Strategies

- A good **strategy must be designed to minimize investments and to reduce risks** when deploying rural broadband access networks
- **Complementary technologies:** to use different technologies and architectures for different scenarios to reduce costs
- **A timing strategy to reduce risks:** defer the less suitable technologies (Satellite and WiFi) at the last stages of the rollout plan
- **Areas must be prioritized** according to their expected demand and according to the amount of services that can be offered by the technology to deploy in them



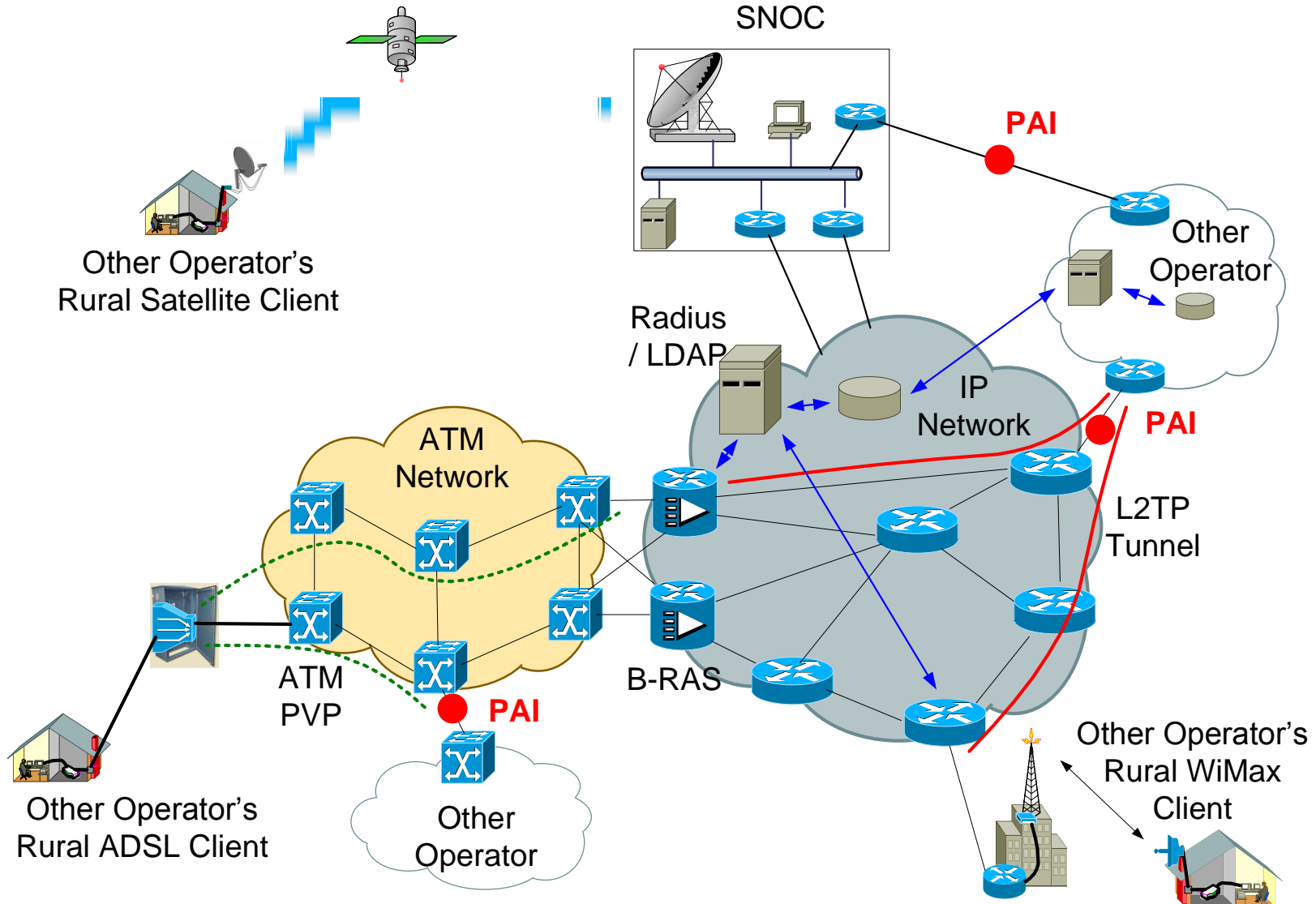
Rural Broadband Services and Applications (1)

Wholesale Services

- Deployed infrastructures must be shared with the rest of network operators according to the existing regulation
- The **same wholesale services that are offered nowadays by the Spanish incumbent operator are replicated by the new rural broadband services**
- **GigaADSL**: Telcos can access their clients' ATM traffic at different areas (109 in Spain) by connecting their ATM switches at previously defined Indirect Access Points
- **Tunneled ADSL IP**: Telcos can access their clients' IP traffic by connecting their IP routers at only one Indirect Access Point for all the Spanish territory. Only transport provided
- **A new wholesale service must be implemented for satellite**



Rural Broadband Wholesale Services





Rural Broadband Services and Applications (2)

Retailer Services

- Internet Access
- E-commerce
- E-learning
- Entertainment
- Virtual Private Networks and Intranet Access



Conclusions

- Deploying broadband access in rural and isolated areas involves **high investments and risks**
- Mainly **due to the high uncertainty in demand, the lack of knowledge of what is going to be the evolution of broadband access technologies** and, thus, the existence of unknown costs which will be correctly quantified only in the implementation phase
- An **in depth analysis of the existing broadband access technologies to define the network access architectures** for the different existing scenarios and a **detailed roll out plan** are vital to reduce risks and costs.
- **Wholesale and retailer services** based on broadband access **must be developed to reduce the digital gap** between urban and rural areas