Being Digital in Valle d'Aosta

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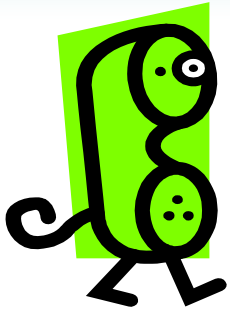
Being digital is *not* being human!

This sentence shortly resumes the ideal position, particularly critical, of some philosophers about the Next Generation Networked World (NGNW), therewith including the Ubiquitous Society.

Maybe, digital technologies, ubiquitous society do not introduce the democracy, but surely a revolution of life!

"Being digital" means to participate to this revolution, and Aosta Valley is going to be a leader Region in this process of innovation!

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The Aosta Valley: "open lab under the sky"!

All the new radio technologies, integrated in a single, innovative infrastructure, focused to reduce the environmental impact, will be implemented and tested in Aosta Valley.

The resulting integrated network could represent a significative example of NGN, and, in any case, it will constitute an important step towards the ubiquitous society, thanks to the extensive use of radio technology.

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The ITU definition of Next Generation Network:

A packet-based network able to provide telecommunication services and able to make use of multiple broadband, QOS-enabled transport technologies, and in which service-related functions are independent from underlying transport-related technologies.

It offers unrestricted access by users to different service providers.

It supports generalized mobility which will allow consistent and ubiquitous provisioning of services to users.

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ACTIONS (1/2)

To promote the usage of the broadband network and, where possible, to take advantage from the ubiquitous network, it is important to look for ways to vitalize the creation and distribution of the digital content.
To sponsor ICT utilization, specific activities in areas such as:

- medical services,
- food safety,
- secured daily life,
- finance for small and medium sized enterprises,
- education, employment,
- work and e-government,

should be promoted.

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ACTIONS (2/2)

Economical incentives for broadband connections will be an important initiative to promote the development process.

Anyone could have a digital service staying home!
It could be a change of the life, particularly in a context like Aosta Valley.

Flat rates and flexible tariffs should be offered by the operators.

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TECHNICAL ACTIONS (1/4)

How is possible to start a convergence process able to create a common integrated communications infrastructure, that is just the first step towards the NGNW and the ubiquitous society? The answer is to start by integrating the existing technical solutions in a valid and flexible infrastructure, paving the way to accommodate cutting edge technologies.

The module of NGN, that will be implemented in Aosta Valley, named Radio Access Integrated Network (**RAIN**), is an example of this strategy.

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TECHNICAL ACTIONS (2/4)

In the proposed architecture, a radio backbone feeds:
- IP signals (all broadband services)
- parallel DVB-T signals (only when & where necessary, waiting for IPTV)

RAIN uses different carriers in UHF, 3.5GHz and 5.4GHz bands, in a P-P, P-MP configuration.

The backbone itself constitutes a "Service and Technology Integrated Network" (STIN), based on radio/optic (HiperLan, WiMAX, Laserlinks, etc.) technologies.

A cost-effective "Access and Distribution Network" (ADN) is candidate to solve the "last mile" problem.

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An example of STIN-ADN Infrastructure

STIN

ADN

FLR

ADN

ADN

ADN

ADN
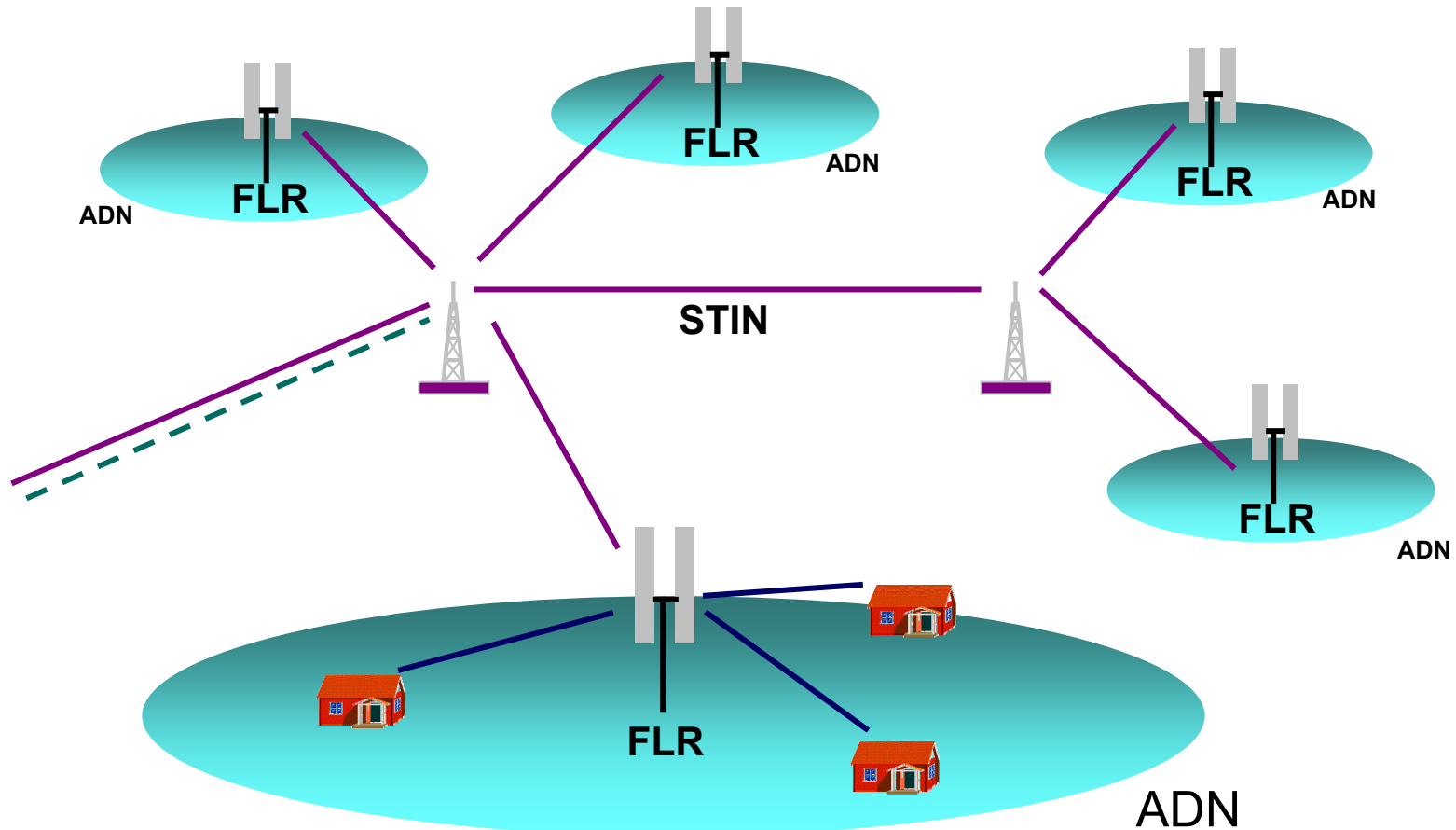
——— IP STIN

– – – DVB-T

FLR: First Layer Repeater

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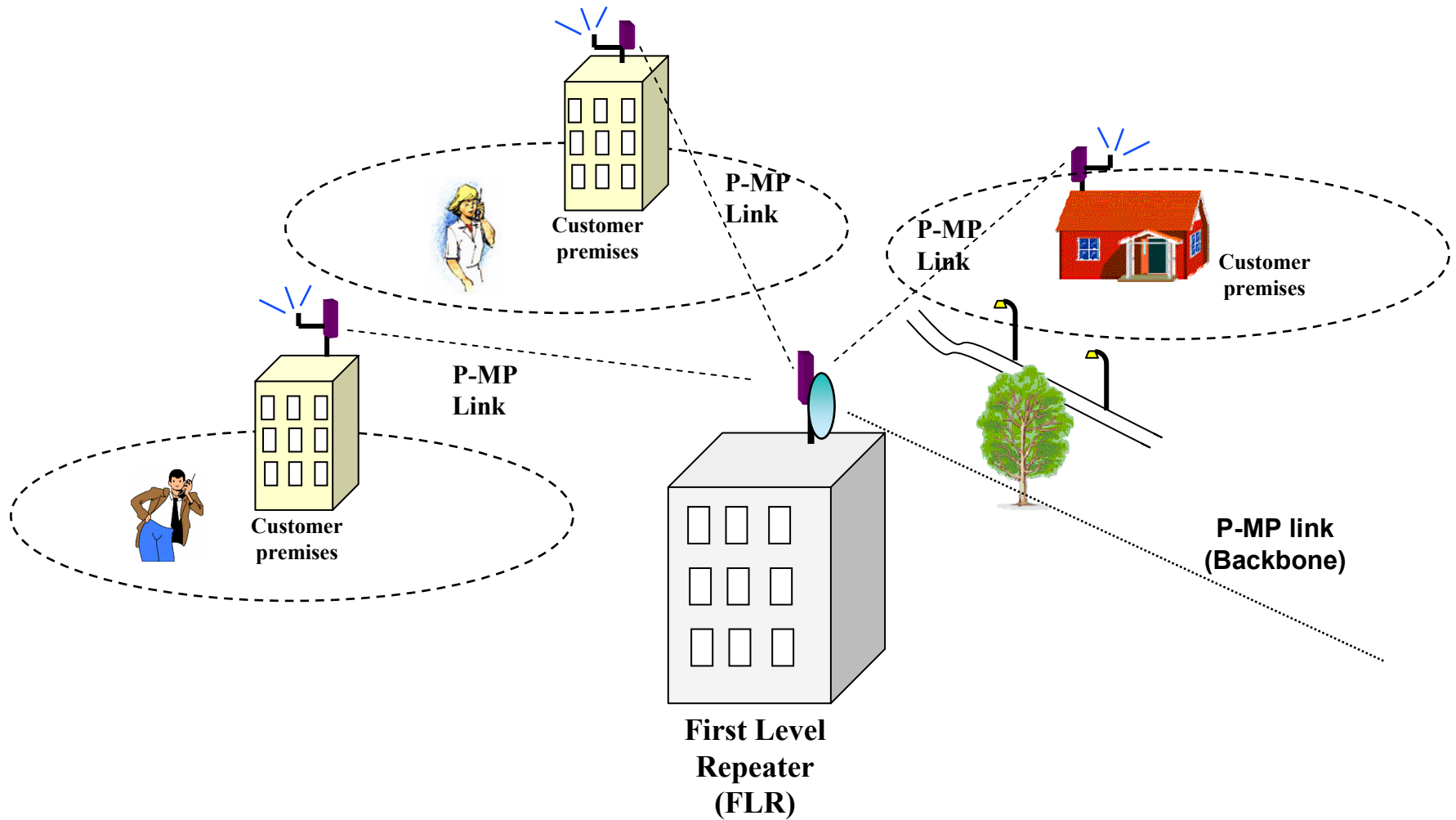
TECHNICAL ACTIONS (3/4)

The multilayer radio architecture could be built using

infrastructures, presently devoted to different service

networks. The resulting architecture permits:

- a capillar penetration of radio signals,

- a reduced emitted power in the air, at any level of the

network.

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An example of ADN

P-MP Link

Customer premises

P-MP Link

P-MP Link

Customer premises

P-MP Link

Customer premises

P-MP link (Backbone)

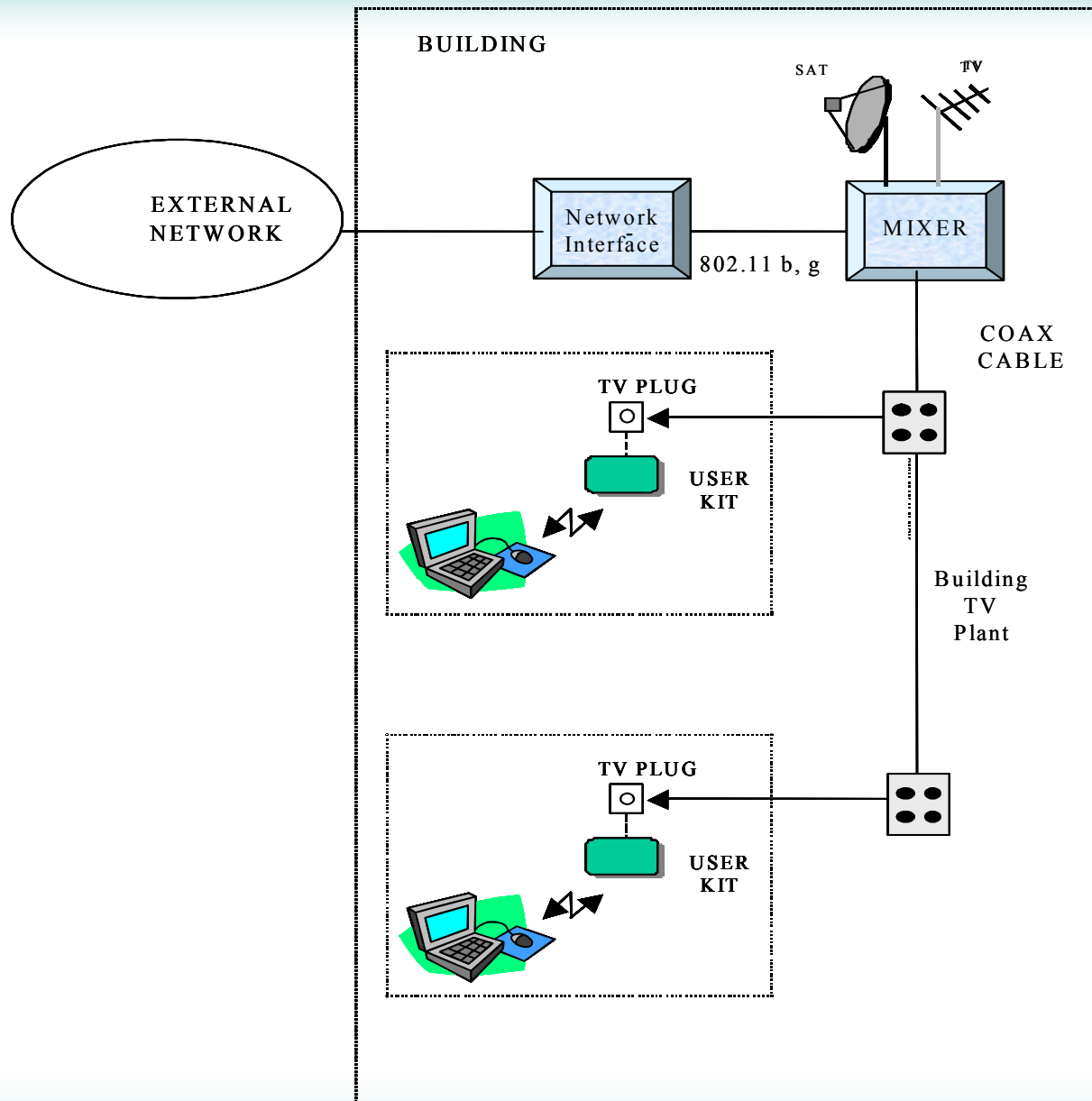First Level Repeater (FLR)

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TECHNICAL ACTIONS (4/4)

To solve the problem of the cabling of the buildings, a "cost effective solution", named Cabled Wireless- End User Access (CW-EUA, FUB patent), using a Master Antenna TV (MATV) or a Satellite MATV plant to access the end-users, will be adopted.

With a light change in the operating TV plant, it is possible to extend the "performance" of the coaxial network in the building, integrating satellite, terrestrial TV and interactive broadband services.

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CW-EUA System

BUILDING

SAT

TV

EXTERNAL NETWORK

Network Interface

802.11 b, g

MIXER

COAX CABLE

TV PLUG

USER KIT

Building TV Plant

TV PLUG

USER KIT

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The experimental trials in Aosta Valley

In order to test new tech's and to evaluate the behaviour of the users in digital experimental zones ("Being digital"!!), where anyone could be "always on", three different areas have been selected:

the **Grand Combin** region

the **Valdigne** region

the **Ayas/Evançon** region

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The three experimental areas in Aosta Valley

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The Experimental Trials (1/3)

Thanks to the RAIN architecture, the coverage areas will be punctual and efficient, and specific tests will be carried out, in the **Grand Combin** region , to compare the performance of different technologies, with particular regard to the **DVB-T micro-cellular** system, proposed and designed by FUB.
This solution is based on the Single Frequency Network (SFN) techniques, low power on-channel repeaters and gap fillers.
In the same trial, an innovative solution, based on WiMAX/WiFi and CW-EUA, to deliver broadband internet signals, will be implemented.

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The Experimental Trials (2/3)

In the area of **Valdigne** the trials will be focused on digital

mobile television: experiments include:

- DVB-H, in UHF band

- terrestrial DMB, in VHF and L bands.

An interactive channel will be implemented by using GPRS,

EDGE and UMTS technologies.

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The Experimental Trials (3/3)

In the third experimental area, the **Ayas-Evançon** region, wireless IPTV applications will be tested.

The radio network will be based on WiMax/HiperLAN/WiFi links.

A challenge for this trial will be the implementation of severe video coding (e.g. MPEG4) and Multicast functionality on wireless IP.

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Conclusions

The possibility to have:

- researchers from Institutional Bodies, Operators and Industries;

- a Region close to the hearth of Europe, with autonomous regional government, ready to collaborate;

- a convergence of interests, between the Region and the research team, to build a public services network, respondent to RAIN architecture, in order to reduce the environmental impact and to take advantage from mixed investments;

- a patented solution to access the end user in a cost-effective way;

offers a unique opportunity to start and go on with this ambitious program in Aosta Valley.

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