

# Interoperability

- ❑ Standards requirements
- ❑ Vision of a manufacturer providing Electrical and Communication Infrastructure systems and Application systems for homes

*Avec vous, comprendre pour mieux innover.*

GROUP TECHNICAL MANAGEMENT  
RESEARCH DEPARTMENT

**TAHI Forum 2008**  
**INTEROPERABILITY**

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# Interoperability!

## You speak about what?

Does interoperability have the same meaning for all?

Does this wording have the same meaning for all?

Smart home

Digital home

Home Automation

Home networking

Interoperability for what?



# ■ **LEGRAND Vision**

## □ **Standards for Infrastructure**

Cable

Connectors

Electrical supplies

Generic transmission systems

## □ **Standards for application systems and devices**

## □ **Standards for Services (remote or not)**

# Cluster Approach

## □ Definitions

Set of home equipment running users applications (usages) being part of a sector regulated more or less by common rules and specific standards with similar access to the market.

## □ Market realities

Several systems driven by different sectors with their related standardization bodies cohabit in the home with a minimum of interactions

# Model for cluster analysis

- Infrastructure
  - Hosting, cabling
- Communication
  - Transmission, communication protocol
- Equipment
- Services related to the processes
- Remote access

Transmission support

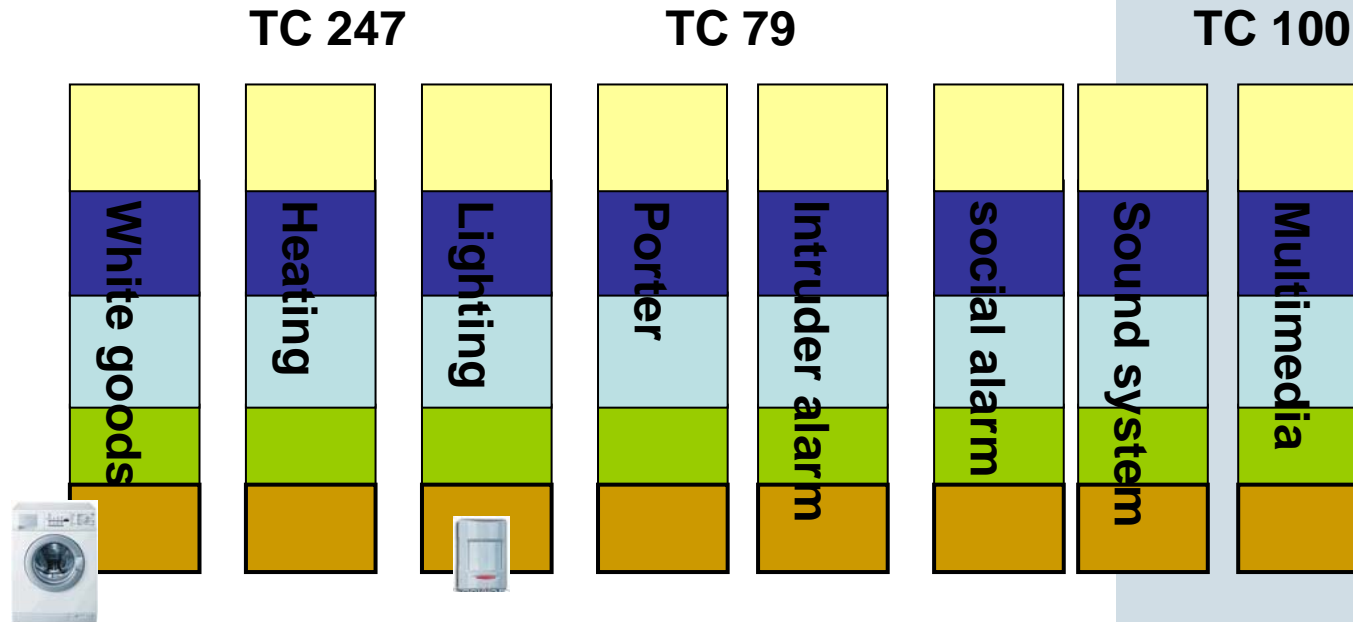
Transmission techniques

Communication Protocols

Communication Services

Applications:  
Formats of contents  
and Application languages

# Independent Clusters



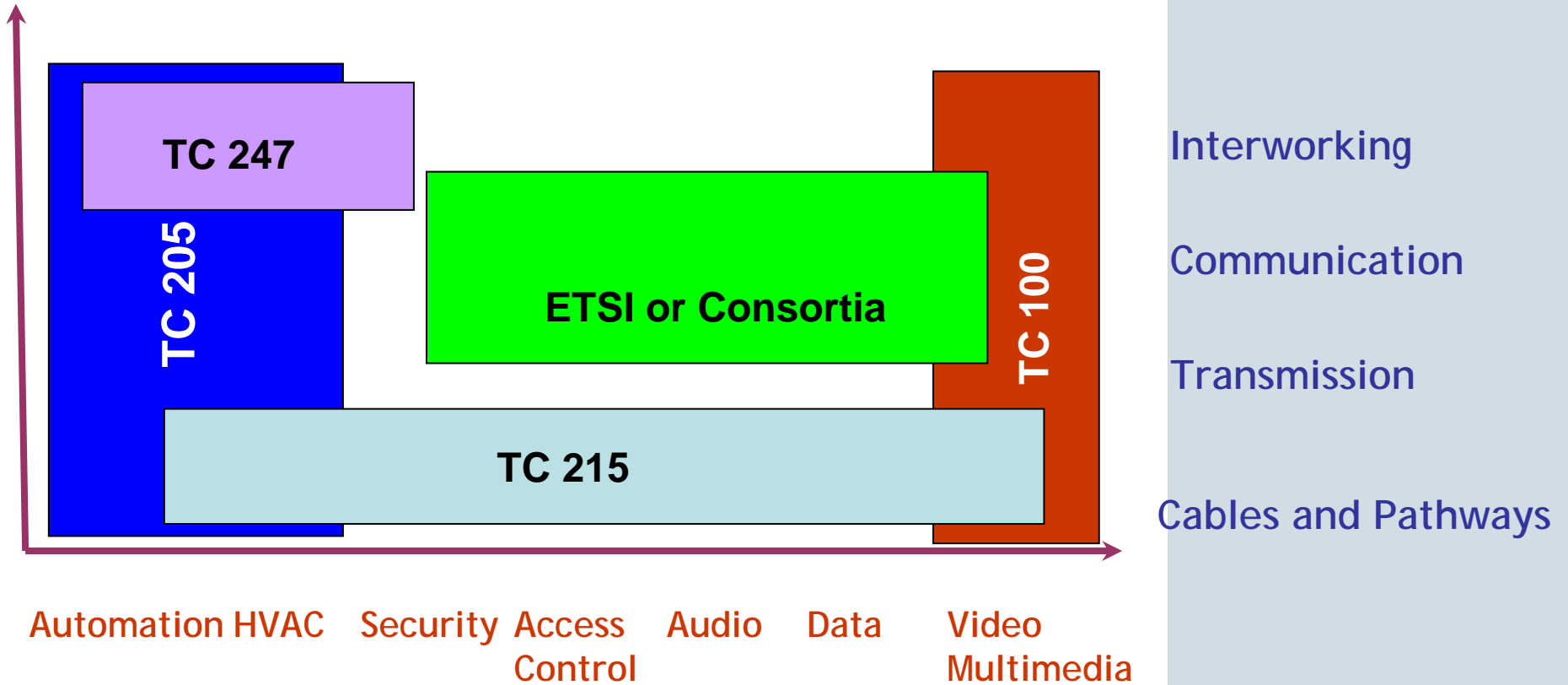
## Today vertical ( silo ) approach

Each Cluster has:

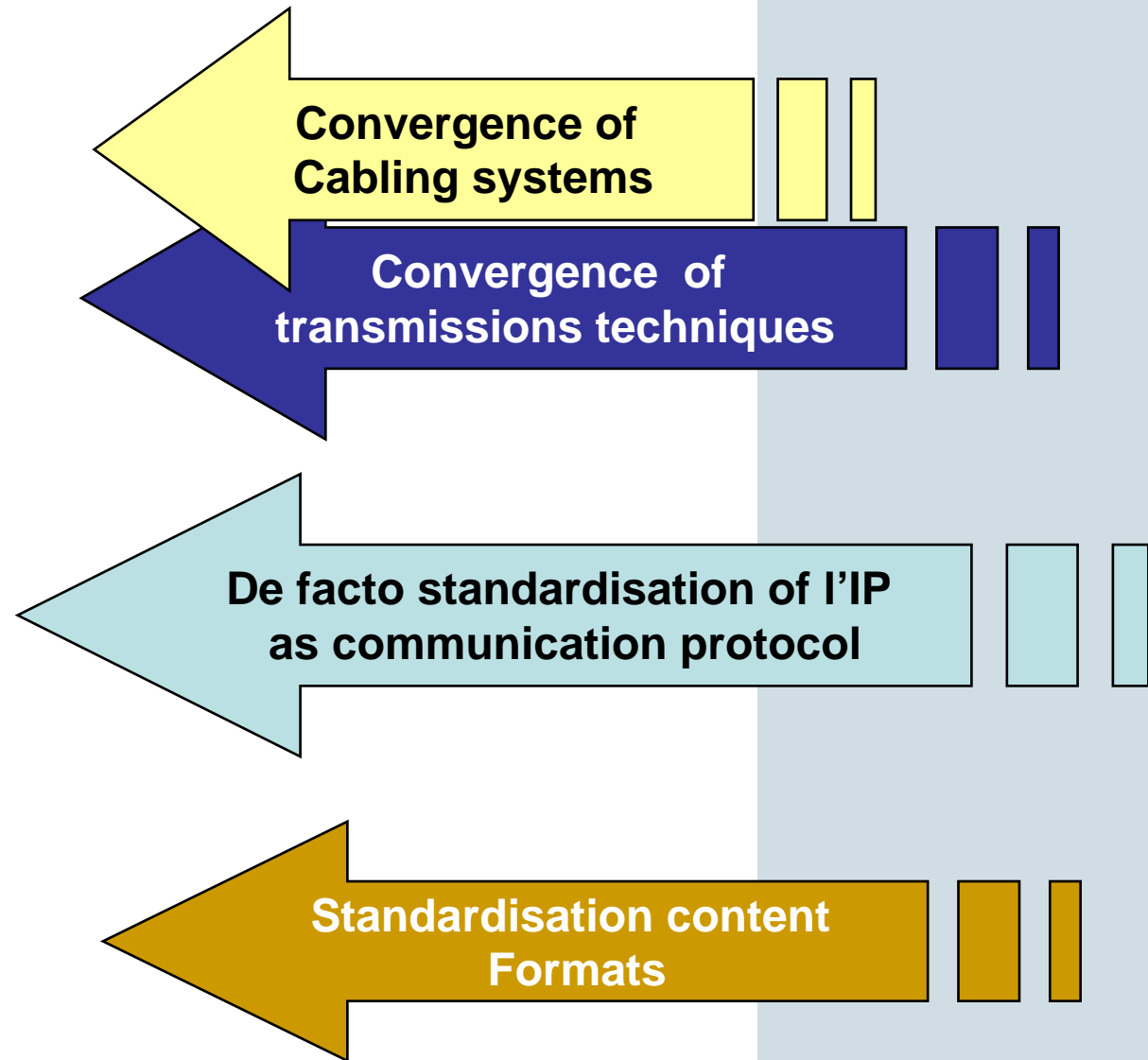
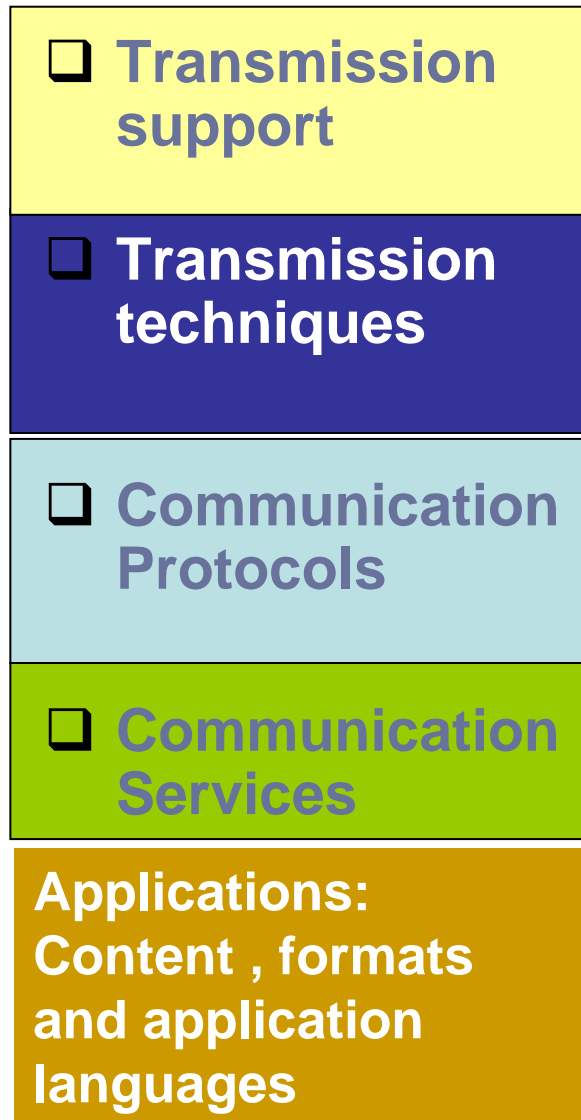
- their own cabling
- their own transmission techniques
- their own data formats exchanged
- their own Gateway for remote services

Standards are made independently cluster by cluster

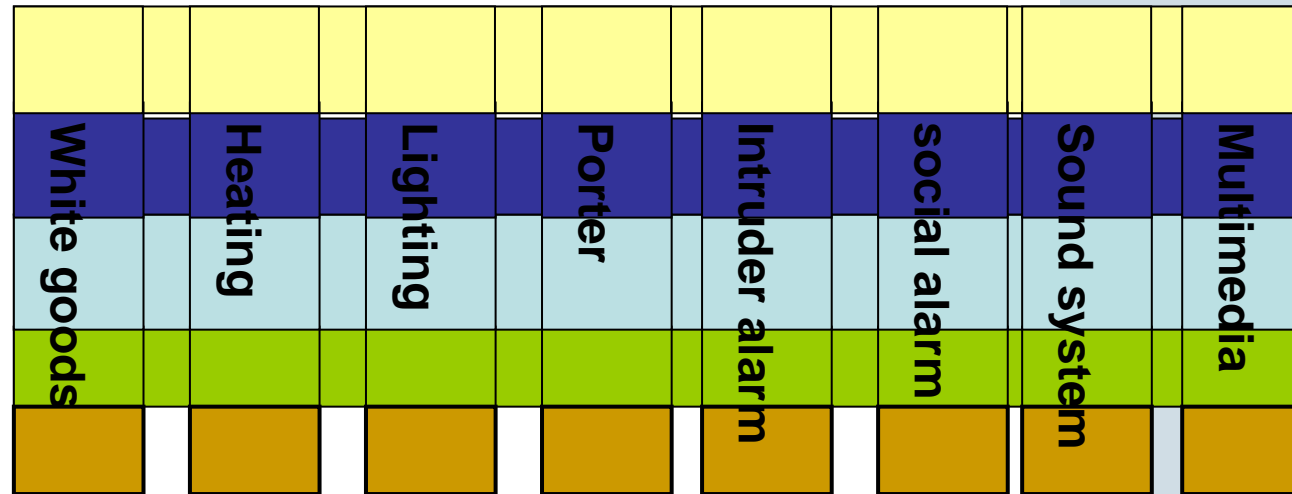
# Scope Redundancy of standardization bodies



# Communication Systems Convergence



# Clusters Convergence



## □ Tomorrow a horizontal organization is required

Share the same infrastructure

Share the same transmission and communication techniques

Share the same communication services

Share application resources

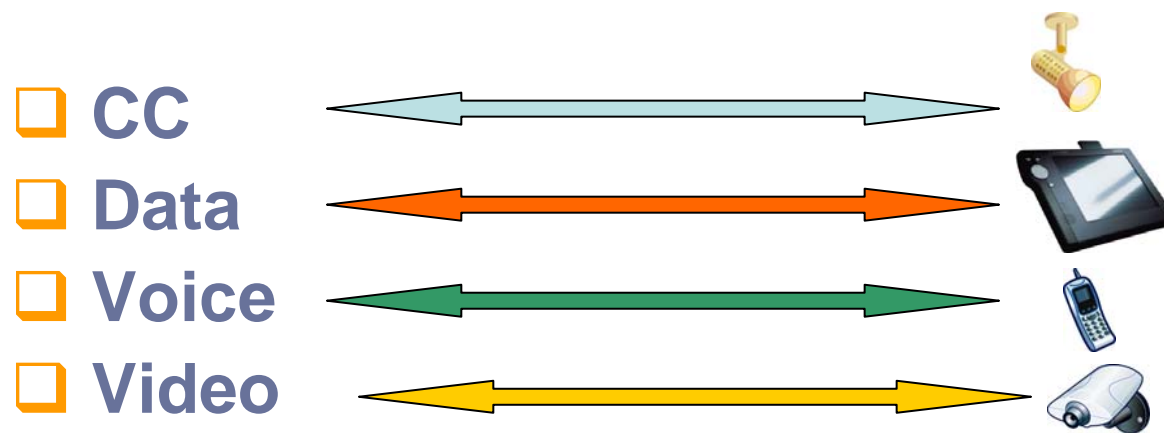
# ■ Convergence of the Infrastructure Systems

- Standardization of cabling systems
- Mutualization of hosting systems, trucking, cabinets.....



# ■ Communication Topologies

At the communication level, convergence will depend on the type of information applications/services have to manage



# Convergence of the transmission techniques (networks)

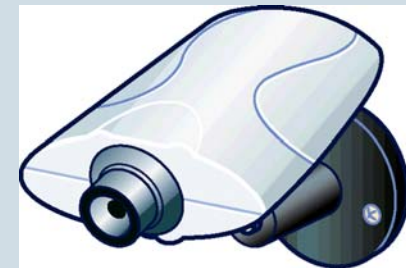
- Common networks
- Quality of Services for network services



	CC	Audio	files	Video
Konnex	✓			
Echelon	✓		✓	
Ethernet XXXBT		✓	✓	✓
HomePLUG		✓	✓	
Bluetooth		✓	✓	
DECT	✓	✓		
WiFi			✓	
Firewire	✓	✓	✓	✓

# ■ Convergence of Communication Services

- Share of communication means  
“Over IP attitude”
- QoS of communication  
processes required for  
applications/services



# ■ Interoperability for all?

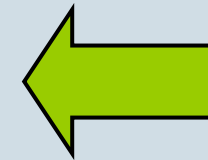
□ Same means from cabling to communication services for all sectors is a dream

- regulation
- usages
- Market specificities
- Cost

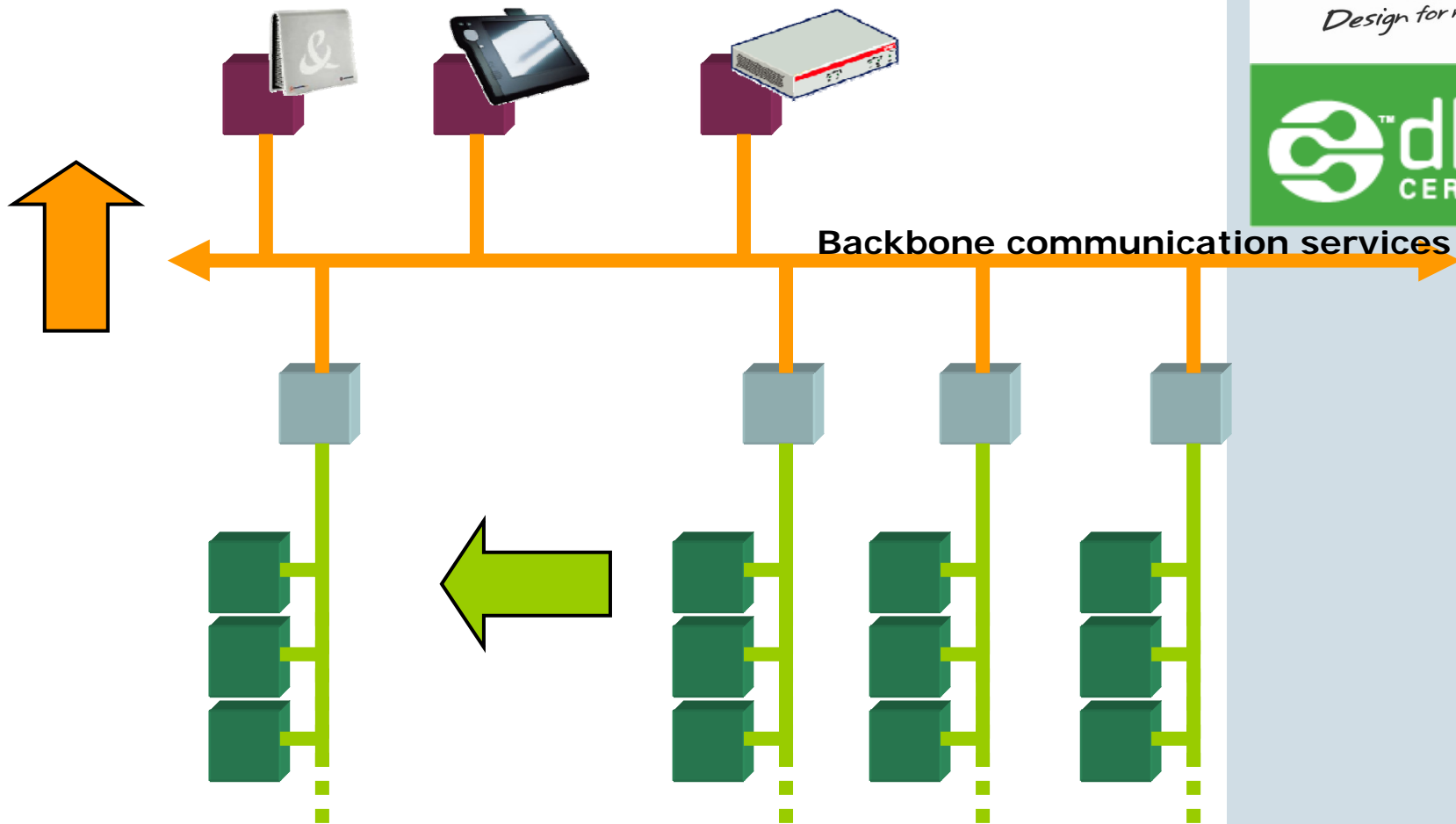
⇒ Pragmatic approach is required

# Interoperability Roadmap

- ❑ Autonomy of clusters for their own processes
- ❑ Merge of the very near systems
- ❑ Take existing standards
- ❑ Mutualization of communication resources at the backbone when its possible
- ❑ Share of application resources at the backbone level



# Hierarchical Architecture



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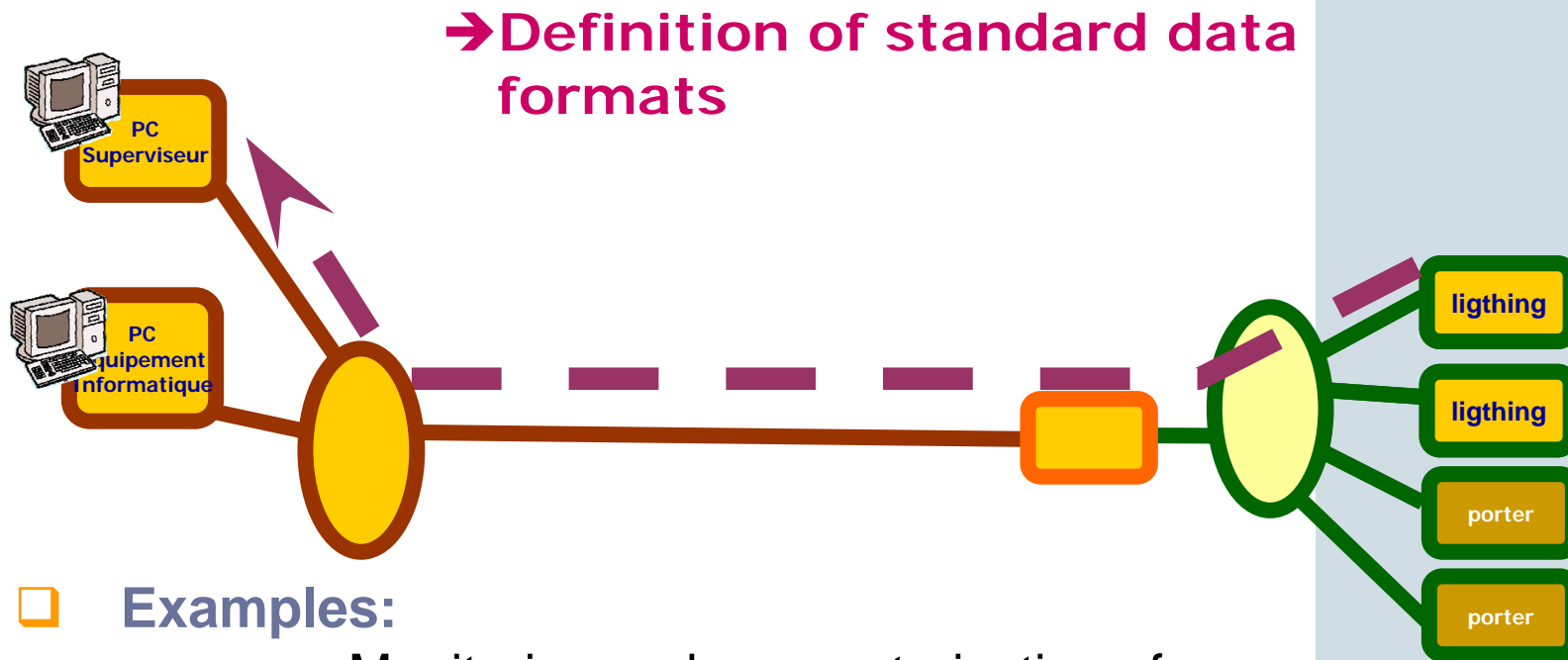
# ■ Definition of Levels of Interoperability in the Application Processes

- Level 1: Monitoring and Parameterisation
- Level 2: Share of resources
- Level 3: Common application resources



# Level 1: SUPERVISION

IP communication services are used to interface clusters with home monitoring systems (supervision, tools for parameterisation )



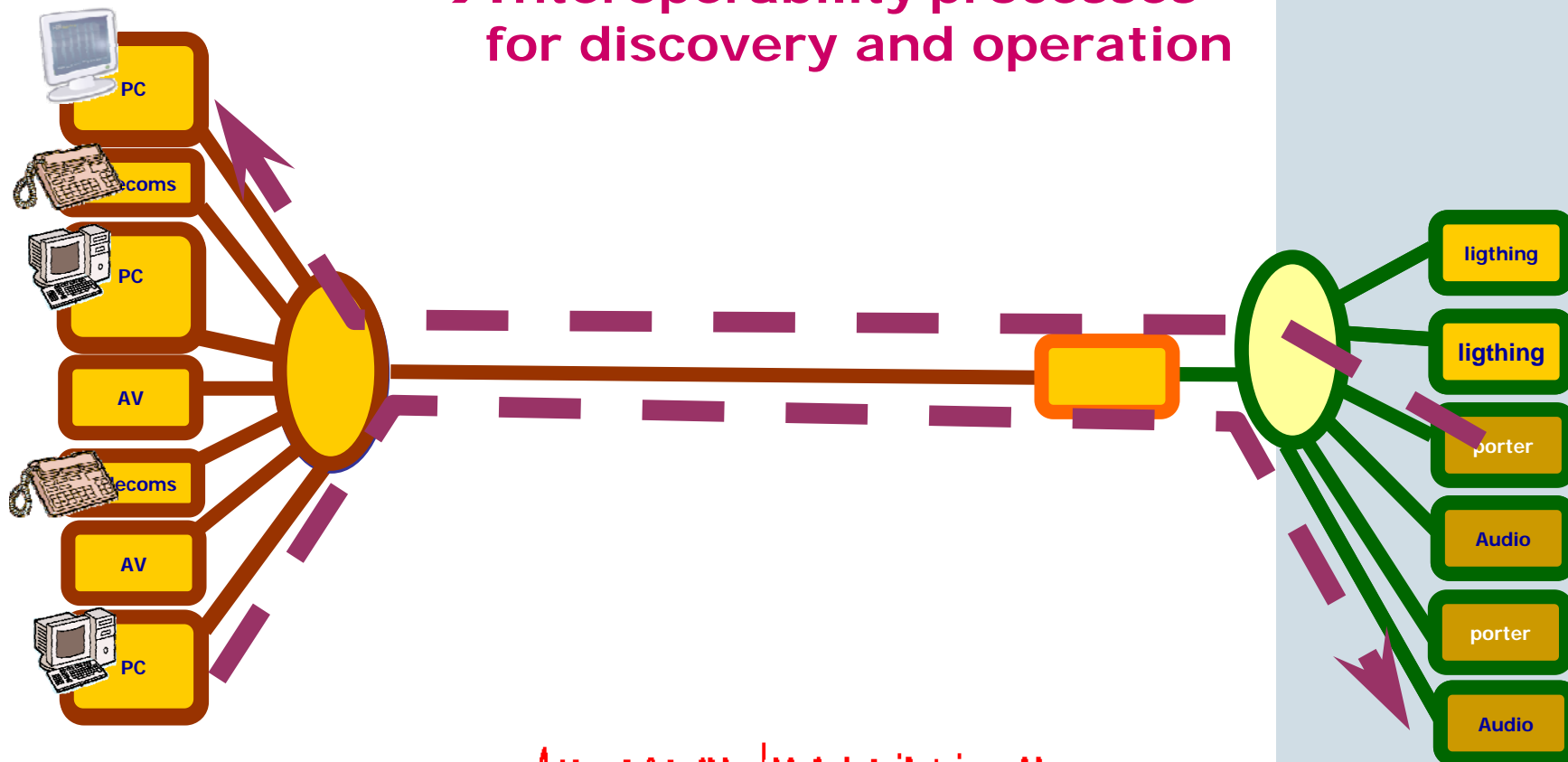
## Examples:

- Monitoring and parameterisation of access control
- Monitoring for fire alarm system
- Supervision « Conciergerie »

# Level 2 INTEROPERABILITY

It is possible for devices belonging to a cluster to provide resources for an other cluster.

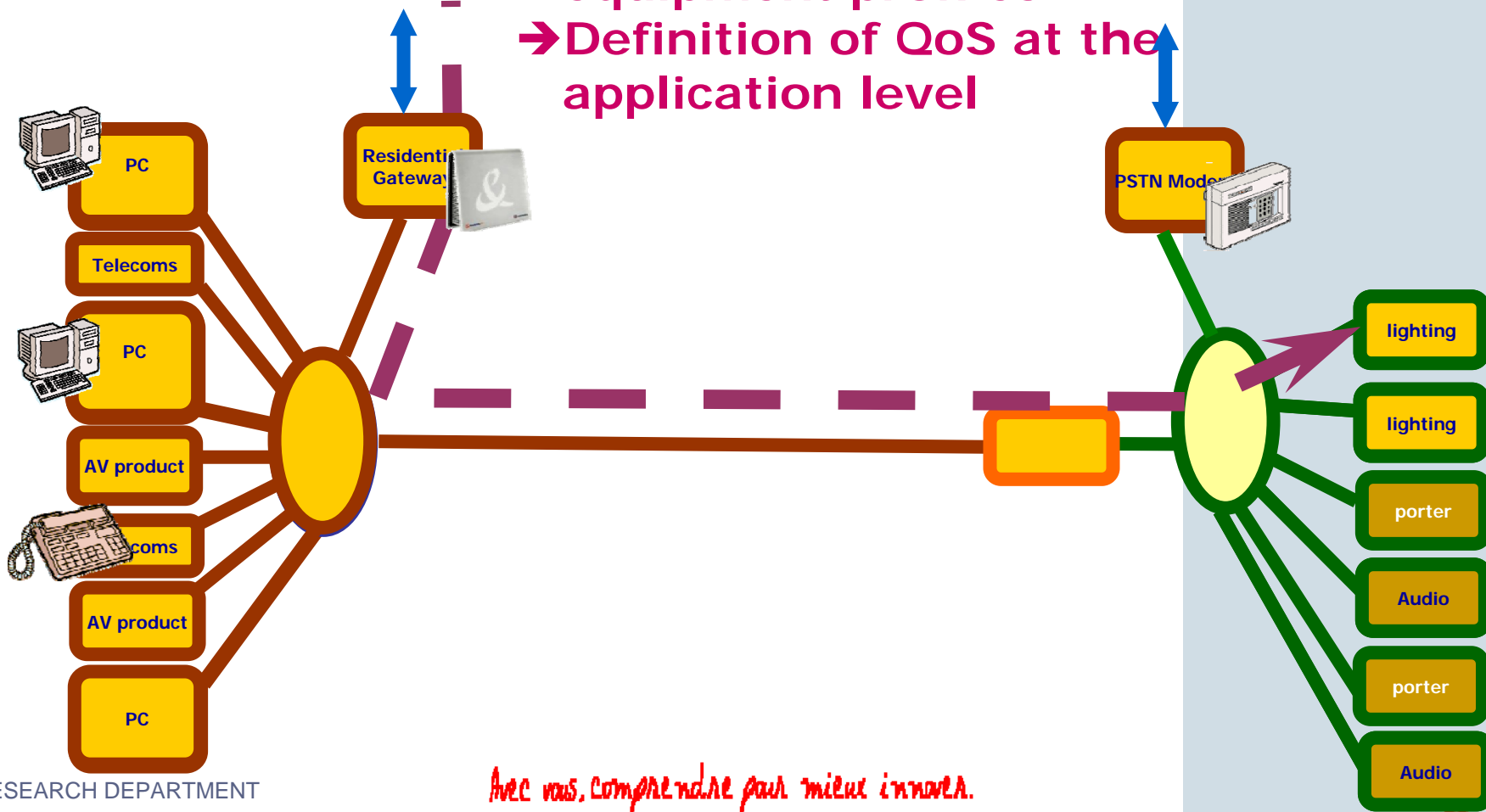
→ Interoperability processes for discovery and operation



# Level 3: MUTUALIZATION

Common functions are mutualized on the IP backbone

- Definition of standard equipment profiles
- Definition of QoS at the application level



## ■ Conclusions

- ❑ From horizontal to vertical organization model
- ❑ Pragmatic approach
- ❑ Capitalized interoperability on a backbone level
- ❑ Not reinvent the wheel, standards are available