FT networks, services and IS evolution perspectives towards convergence

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France Télécom vision
The end of "one usage, one device and one network"

Customers at the center of their communication universe
A clear vision of the market, a clear-cut strategy for the Group

Offering the customer an integrated communication universe, whatever the device or network used

The integrated operator model: driving development

Expertise in networks and emerging technologies

Customer and usage-oriented know-how

Integrated innovation strategy
The strength of a worldwide integrated operator

Presence in **220 countries and territories**

**125 million customers** worldwide

2004 Revenues: **€46.16 billion** (1)

**206,524 employees** at the end of 2004

A world leader in telecommunications R&D

The leader on its key markets

(1) IFRS standards
Building the network of an integrated operator

- Converge network architectures to a limited set
  - Fitting local conditions (network size, local regulations...)
  - To reduce architecture cost of ownership
  - To get a common set of network elements

- A common network per country
  - To reduce costs (external, operational...)
  - To take advantage from economy of scale
  - To enable quick launch of convergent services

- Take benefit from converging technologies
  - Common service platforms using standard service enablers
  - Towards IP/Ethernet technologies
  - Between fixed and mobile (NGN, IMS, ...
Main network directions

- Develop High Bit rate access
  - Increase accessibility, Bit rate, Quality of Service
  - Anticipate and support new services development

- Build an optimised network infrastructure for multimedia services and business services
  - For Residential and Business customers
  - Based on shared IP network carrying voice, data, and image
  - A common control architecture based on IMS architecture for Fixed and Mobile services

- Take quickly advantage from today and future network and IT techniques
  - To bring rapidly the innovation to all customers
  - To constantly optimise the costs

- Develop network Quality of Service from the customer prospective
  - Robustness, Reliability, Security
Broadband access

Networks, Carriers and IT
FT broadband strategy directions

- **Deploy DSL offers outside France**
  - Based on LLU when possible

- **Increase broadband coverage in France**
  - 2004: 90% of lines target reached end 2004, 95% end 2005 & 100% end 2006

- **Expand DSL offer**
  - ADSL2+ started last December in Paris
  - Two pairs SDSL launched H2 2004
  - Debit max started in 2004: the maximum bandwidth of your line

- **Provide multiservice DSL access**
  - Based upon ATM bandwidth sharing on copper line
  - TV on DSL started in Lyon (Dec. 03) and Paris (March 2004)
  - Videotelephony started end 2004
  - Double play offers TV+internet, Voice+ Internet

- **Increase service reach in already covered areas**
  - Re-ADSL started in 2004
  - Coverage enhancement on remote activity areas (ZAE)

- **Continue corporate fibre access deployment**
DSL market in France

Market driven by residential Internet access
- Provided by ISPs buying wholesale products or using LLU
- With a 49% market share for France Télécom (ART estimation 2005)

DSL users
- From: 3.3 millions (end 2003) to 6.1 millions (end 2004) (ART 1/2005)

Local loop unbundling (started in 2002)
- Line sharing has taken off
  - 4 000 shared lines end 2002, 273 000 shared lines end 2003
  - 1.495 millions shared lines end 2004 (+95 000 fully unbundled)
  - Early April 2005: 1.88 millions shared lines and 152 000 fully unbundled

Evolving towards dual or triple play offers
- Internet + Voice + video (VoIP or POTS voice)
- Home Gateways provided by operators: Livebox, Freebox…

DSL on enterprise market
- ADSL and SDSL offers as an alternative to LL or PPC

A very competitive market, low prices
Mobile access networks

- Data services available in GSM
  - With GPRS
- New access broadband infrastructure
  - Based on UMTS and EDGE
  - UMTS service started in UK and France in 2004
Core networks
IP backbones

- In France
  - Provide Internet access, VoIP connectivity, enterprise data services
  - Two separate cores, one for residential, the other for business services

- IP residential backbone based on around 30 PoPs
  - Serves more than 400 edge nodes (BRAS, VoIP nodes…)
  - An IP traffic exceeding 100 Gbit/s at busy hour
  - A three levels network, meshed at the two upper levels
  - Majority of transmission links based on 2.5 and 10 Gbit/s wavelength
  - A fully duplicated IP network
    - Duplicated nodes and links
      - To fulfil reliability requirements
    - Transmission failures handled at IP layer by rerouting
Voice networks
Fixed voice network context

Traffic evolution on existing networks

- Decrease of PSTN traffic
  - PSTN originated voice traffic decrease (-0.3% Sept 2004/Sept 2003)
  - Internet dial up traffic decrease (-22.6% Sept 2004/Sept 2003)
- As a whole voice traffic (fixed + mobile) is still growing (+7.2%)

A fast evolving technical context

- Fast deployment of broadband DSL access + LLU fast growth
  - Appearance of significant competitive VoIP offers
  - Accelerating voice PSTN originated traffic decrease
- FT VoIP service started combined with Internet access
  - As a second line service
  - Fixed access solutions appear on GSM networks.

A part of TDM switches candidate for renewal

- Installed in the early 80s
Which technology for conversational services?

Main requirements

Get an architecture open to future multimedia services

- Base the architecture on IP connectivity
- Provide a control architecture able to offer other services
  - External application servers capability
  - Nomadism capability embedded

Get a robust architecture against voice future uncertainty

- A unique way to transfer voice in the core network
  - VoIP seems to be the solution
- A common access network for all conversational traffics
  - DSLAM as a universal connecting unit

Take benefit from being an integrated operator

- Share technologies between fixed and mobile
- Take benefit from IMS definition from the mobile side

Provide standard voice network quality
Why an IMS based control architecture?

- Take benefit of the 3GPP definition work
  - System oriented to SIP session control
  - Suitable for conversational services
  - Include mobility and centralized user data management
  - Possible synergies in product development costs (fixed and mobile)

- IMS architecture seems to be a good basis for:
  - Controlling IP phones and RGW through SIP protocol
  - Controlling DSLAM VoIP gateways (PSTN simulation)

- Network convergence?
  - Restricted to data based applications as long as IMS is not controlling mobile voice connections
  - Mobile voice control under study by 3GPP
  - Can be used for Nomadic services in the fixed network
Network management and IT
Convergence of networks and IS

Large Telco IS based on IP networking
- IT infrastructure optimisation experience
- Specific skills on security aspects

Networks becoming IP centric
- Network control platforms
  - More and more based on “standard” IT technologies
    - Servers, OS, data bases...
  - Limits: real time aspects, scalability in terms of number of users
  - Lifetime decrease
- Service platforms cross the border between network and IS
  - Interact with network and IS
  - Take full benefit of IT technologies (same limits as network control platforms)

Interest in joining network and IT skills
- Security as a shared topic in an IP context
- Separation of control and transport in future networks
  - Paves the way to concentrate call servers on a reduced number of sites (from 100s to 10s) (Data centres ?)
- Time to market decrease
  - Through a global approach of services implementation
Service platforms

- IP and IMS architectures allows for
  - Common service platforms shared between several usages
    - Common mail platforms, common voice mail platforms...
    - Application servers in IMS architecture
  - Platforms using basic building blocks
    - Identity: a common SSO
    - Address: a common address book accessible from different networks
    - Presence....

- Service platforms policy allows for
  - Decreasing time to market
    - Service development less coupled with network development cycle
  - Reducing development costs
    - By sharing them between BUs and countries
  - Decreasing cost of ownership
    - By using common IT platforms to support services
    - By relying on standard IS operations
  - Standardizing FT services look and feel
Network and IS urbanisms

- More and more to be coordinated
  - Need for evolving legacy IS
    - To take into account broadband access
    - From a voice centric model to a multi-service model
  - Need to redefine functions distribution
    - Between the three layers (network, SP, IS)
    - With the objective of not duplicating functions
      - E.g. content billing located in IS not in each service platform
  - Need to redefine interfaces
    - Taking into account security issues

- Need for sharing common data models
  - To get a consistent vision between layers (networks, SP, IS)
  - To allow service integration between different networks
  - End user information model for example
    - Needed for service convergence
IS and network technology evolution

- Although IP is foreseen as a convergent technology
- Mono technology network is a target never reached
  - Technologies coexist in networks and IS
    - During a long period due to migration costs to be faced
  - They cooperate to provide specific offers
    - When starting to deploy new technology/offers
    - E.g. Giga Ethernet MAN long distance interconnection via 3G SDH
- Coexistence of technologies may be a way to reduce TTM
- IS must be able to face this situation
- Without jeopardizing time to market
  - Capability to get an end to end management of a multi-technology based offer (e.g. Ethernet+ATM)
    - Cooperation of different element managers
    - A unified vision from provisioning and after sales point of view
  - Speed up network technology transition
    - While keeping provisioning capabilities
  - Efficient failure diagnosis on complex offers
    - At service level and end to end
    - Knowledge management based
New challenges on IS

Home network management
- Impact of Triple play services: home gateways deployment
  - Software versions to be managed
    - Base + plug-in
  - Automatic HGW configuration
    - To comply with network/services configuration
    - To fit with home network arrangements

Towards self provisioning
- Started on a little scale with voice networks
- IP connectivity up to CPEs will make it more and more common in the future
  - Need for embedding such capabilities in management architecture
  - Need for multi-channel access capabilities (GSM, Internet browser, Set Top Box)
- Need for security and trust management
Conclusions

Networks and IS are facing disruptions

- Transitioning to IP based networks
  - VoIP, Ethernet as new network infrastructure…?
- Development of BB access: from copper to fibre?
- Content based services
- Fixed mobile convergence

IS and networks are to work closer and closer

- A common urbanism to be developed
- Common technical architecture for IS, control and service platforms
  - Becomes feasible

To reach true convergent networks and services

Need for global cooperation on these issues

- Important role of standardisation fora