FT networks, services and IS evolution perspectives towards convergence

Patrice COLLET
France Télécom
Network, Carrier and IT Division
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

STRONG BRANDS

(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
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