IP-telephony and fixed networks trends

Regional seminar on costs and tariffs

for the TAF group member countries

Yaounde, April 5-6, 2004

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ITU Expert

1- The operators' challenge
A customer and service oriented view

- **PART 1 - The operators' challenge - A customer and service oriented view**
- **PART 2 - PSTN and IP convergence - The Next Generation Network (NGN)**
- **PART 3 - The CoE workshop on NGN economics**

Operators' Challenges : How to fill the gap between cost of access and revenues from services ?

- **Cost lays in the access**
- **Broadband access opens the limits compared to narrowband and provides for a wide potential for different usage rates**
- **Access to uncontrolled services is a facility with limited value and does not guarantee a profitable business case : see current profitability issues for Internet Access Providers**
- **Value and revenues are in the services. Question :**
  - Which service ?
  - How is it provisioned ?
  - How is it delivered ?
  - Is it effectively billable ?

A customer & service oriented view

3 types of services may be offered by the network service providers

- **Basic packet transport and routing services**
  "Data best effort"
- **Managed data transport services**
  "Data QoS and security"
- **Communication services fitting with end user needs, as and when needed**
  "Communication Services"

3 types of revenues for Network Service Providers

Type 1 — Data best effort

- Internet today, IP networks of today, Information highways
- Enhanced by higher transport bandwidth, proxies, caching, content based switching (webswitching)

Type 2 — Data QoS and security (end2end data transport with associated QoS

- Frame relay and ATM service networks, MPLS
- Internet access services
- IP networks enhanced by tag switching, IPsec, IPv6, Diffserv, MPLS
- To be further enhanced with evolution of Border nodes and BAS, the key to Data VPN services with associated QoS/SLA

Type 3 — Communication Services

- TDM telephony services, NB NGN, IN services offered to users and enterprises
- User to user controlled and interoperable multimedia services
- Multimedia controlled communication services needed by **enterprises**, **content** and **service providers** to develop **B2C** and **B2B** business

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ISPs
Internet Backbone Providers

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Data Carriers, Internet Access providers, Backbone wholesalers

Type 3 — Communication Services

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Incumbent, Mobile, voice oriented CLECs, Data Carriers expanding to multiservice

3 types of revenues for Network Service Providers

- **Data best effort**
  - Internet today, IP networks … Information highways
  - Enhanced by higher tra… dth, proxies … content based switching (webswitching)

Type 1

- **Data QoS a… ty (end2… a transpo… associate…**
  - Frame… M service n… S
  - Inte… services
  - IP net… enhanced h… g, IPsec, IPv6… LS
  - To be further enhan… generation of R… and BAS, the key to Data VPN servic… ated QoS/SLA

Type 2

- **Communic… ervices**
  - TDM telephony s… ices, NB NGN … offered to users and enterprises
  - User to user controlled and int… ultimedia services
  - Multimedia controlled comm… ervices offered to **enterprises**, **content** and **service providers** to develop… nd **B2B** business

Type 3

Borders are blurring (but not vanishing)

Value is in enabling services, not in data connectivity

Users are asking for services, Enterprises want to reach more people

2 - PSTN and IP convergence - The Next Generation Network (NGN)

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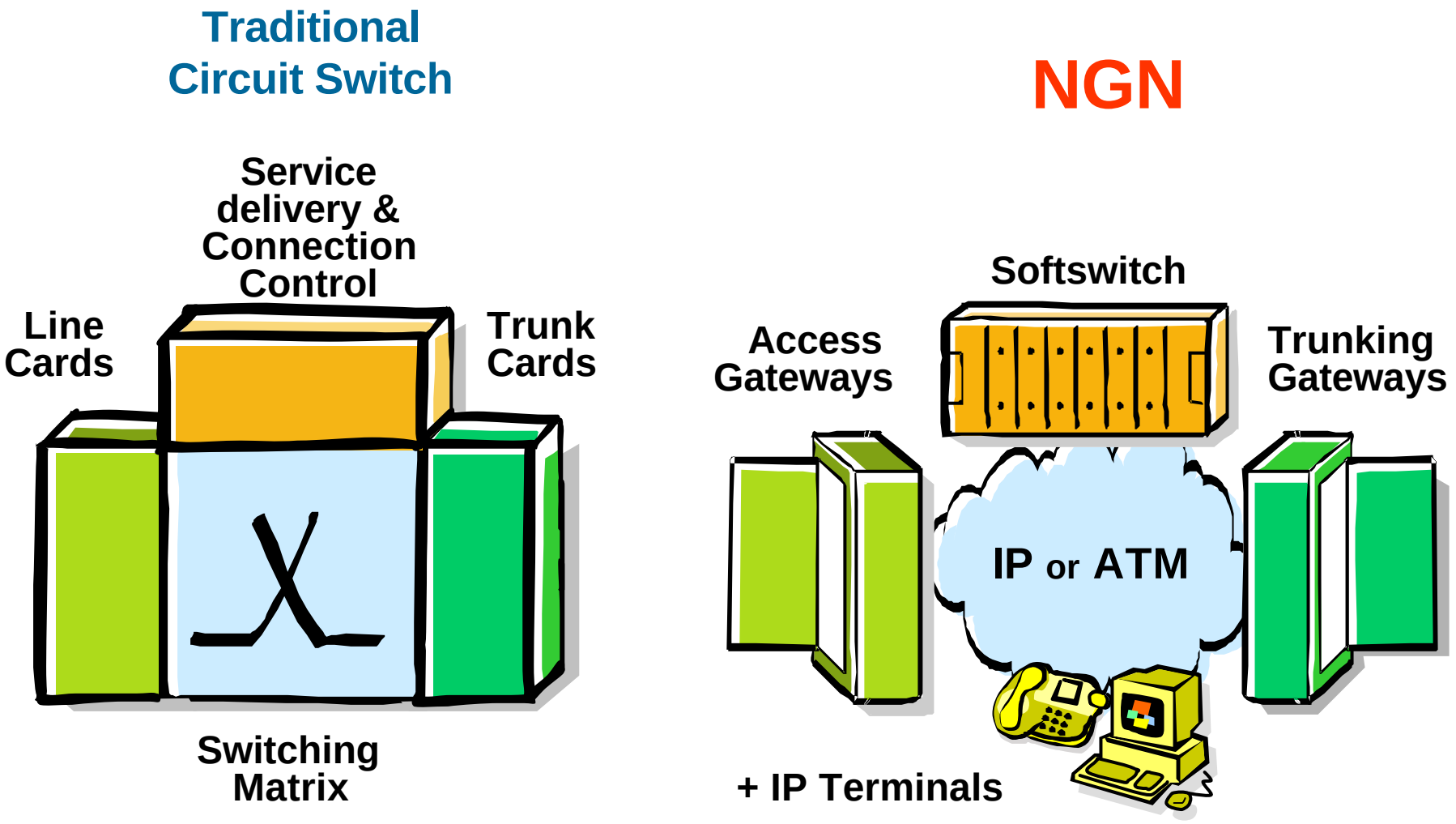
IP and switched telephony convergence
The case of “Alice” and “Free” in France

- **2 competitive actors**
  - with a brand new offer (both launched Feb. 2004) of high speed Internet (ADSL 2048/256) and telephony services **when local loop unbundling is effective.**
  - both offering “free” national calls
- **Alice : € 46.95 / month**
  - full switched telephony service through local line narrowband access at a competitive price with same service and quality as France Telecom
  - **8 ct/min** for calls to Europe and large industrialized countries
- **Free : € 29.99 + € 13 (FT subscription) = 42.99 / month**
  - Low cost IP telephony through ADSL with a good quality for most of the calls : **3ct/min** for calls to Europe and large industrialized countries
  - User keeps using FT for some special services and shared revenue calls, fax and modem calls, and whenever best-effort IP telephony is not good enough.
- **With different technology, different QoS, different prices they now compete on the same ground**

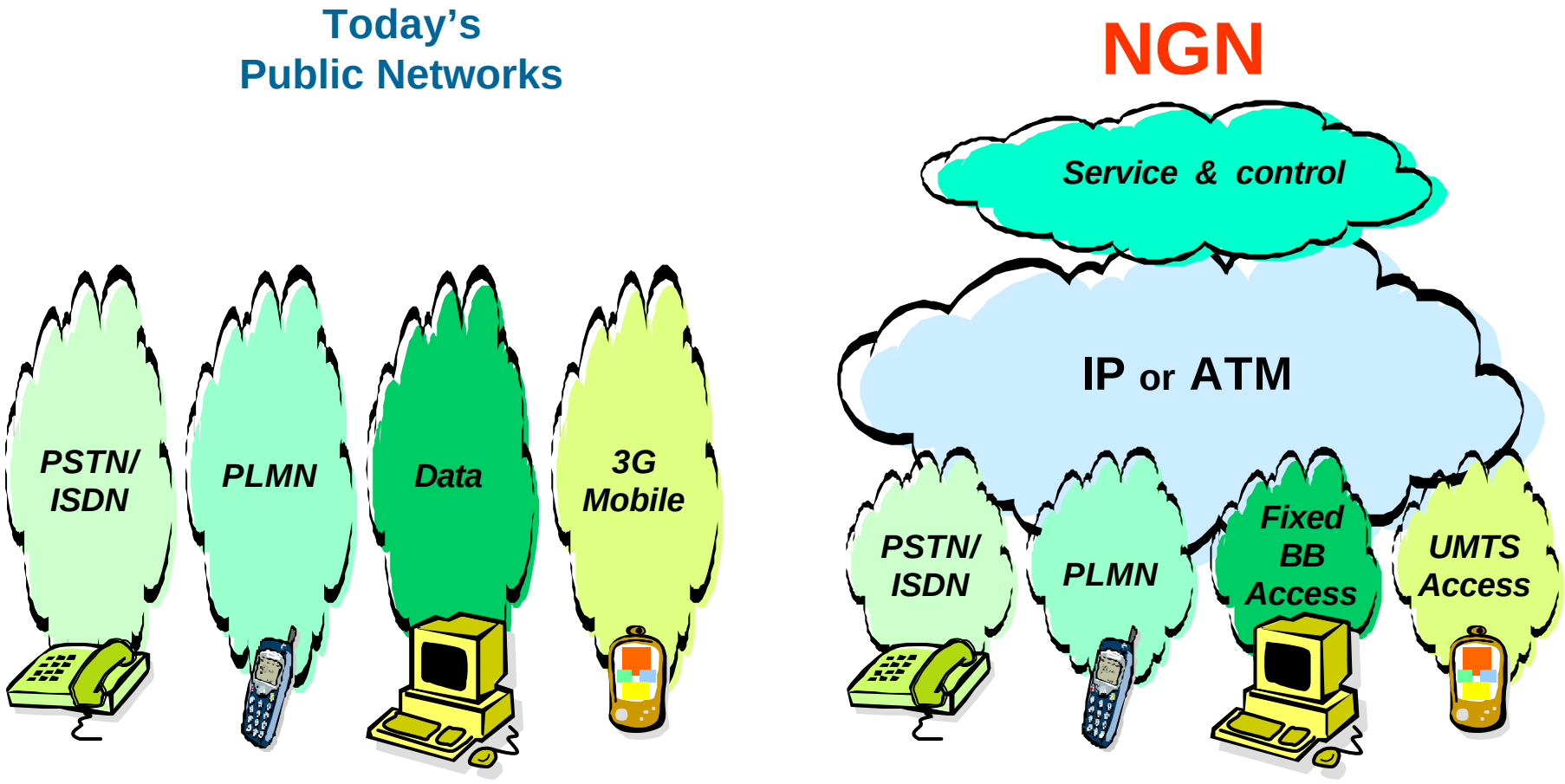
Usage based revenues require QoS and simple service delivery

- **Voice telecom networks today :**
  - User only requests a communication service from the network
  - Network knows the service semantics and applies the appropriate QoS
- **Data networks today :**
  - User provides QoS constraints at transport level to its access network
  - QoS supported at engineering and network management level (SLA) moving to resource reservation (MPLS), traffic prioritization and policing (Tag switching, Diffserv).
- **NGN networks :**
  - Both models have to co-exist
  - Telecom way is needed to support the most revenue-generating person to person communication flows

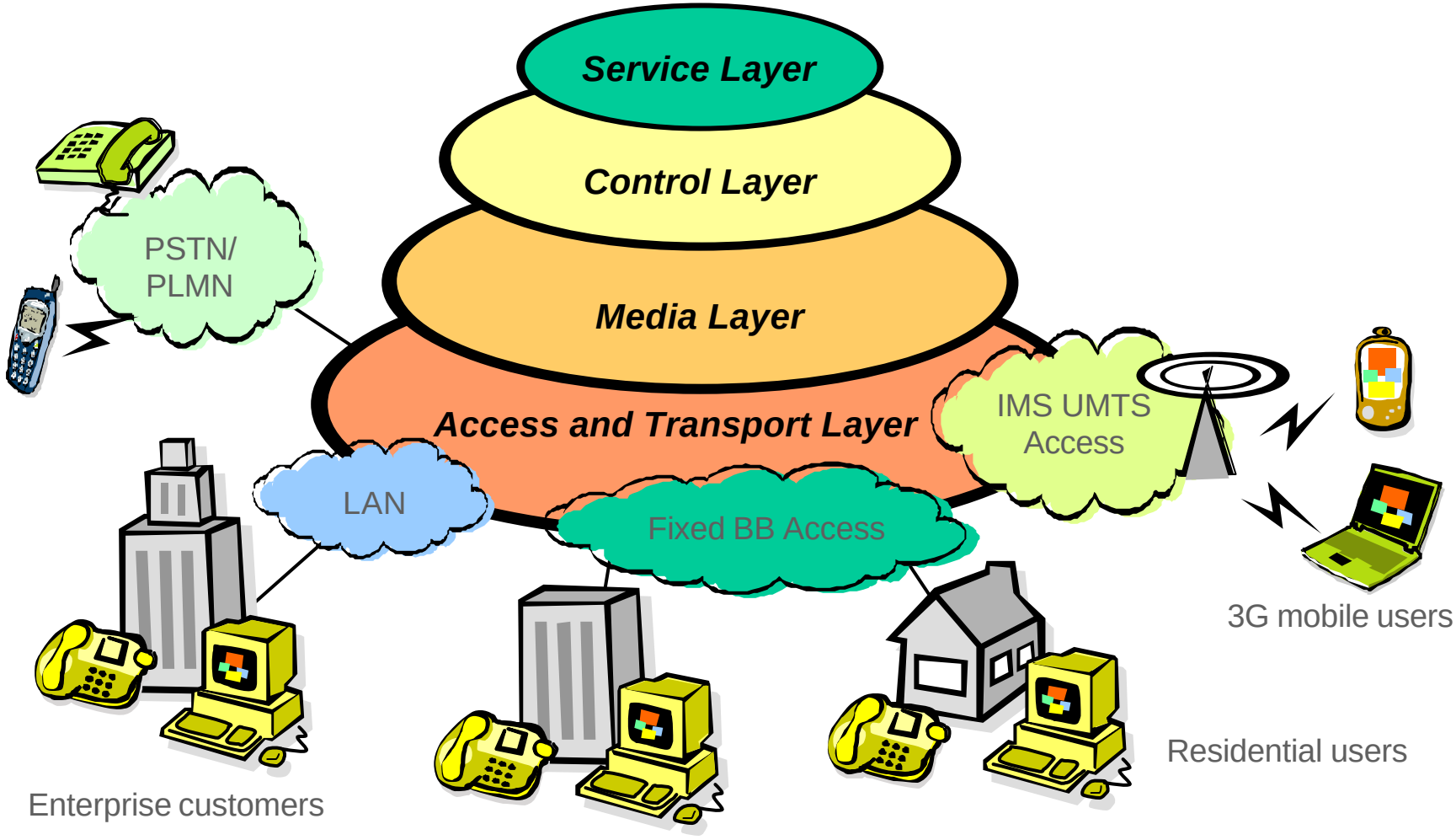
NGN Architecture Principles (1)
Distributed Architecture



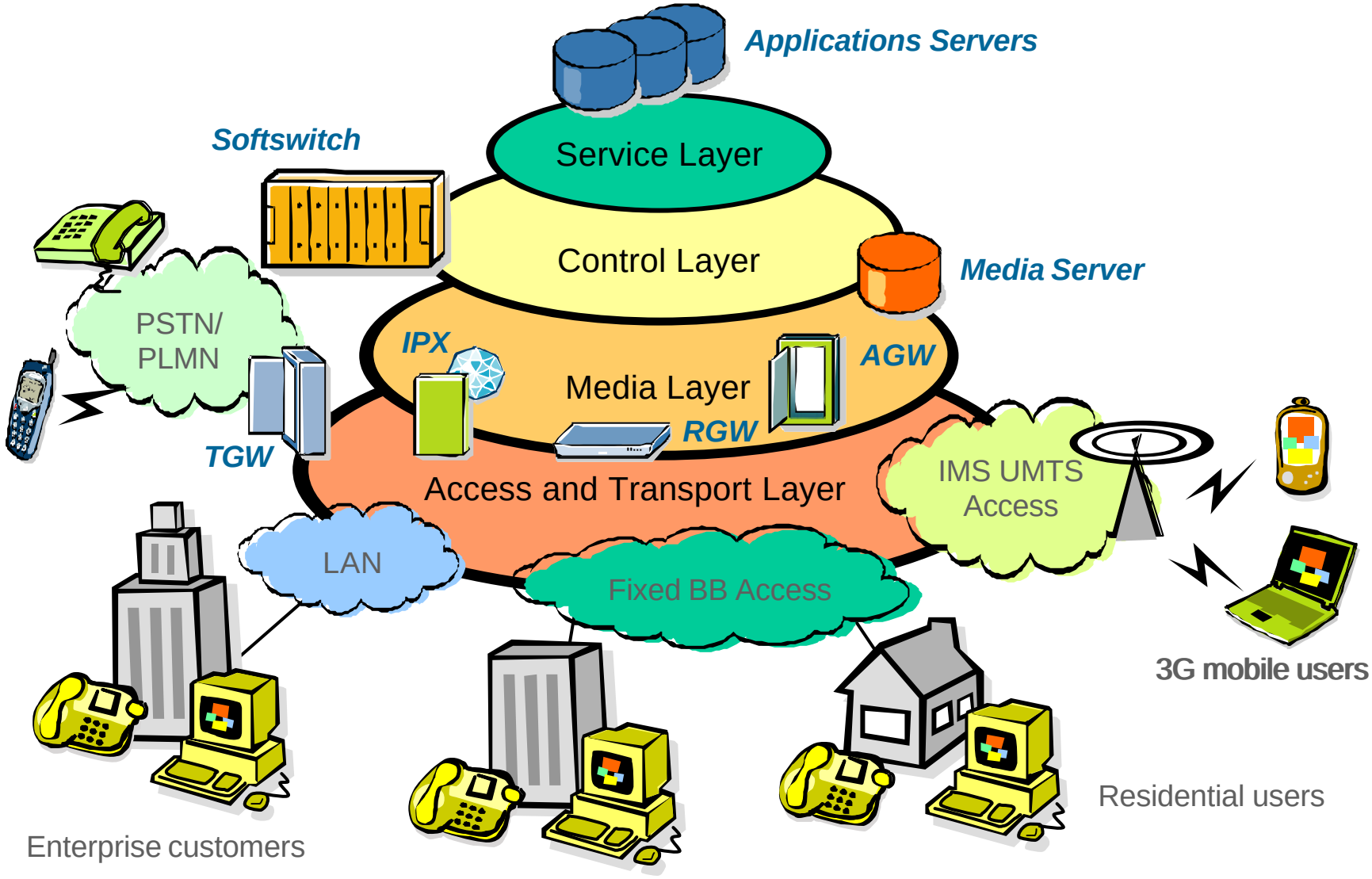
NGN Architecture Principles (2)
Common Transport Infrastructure



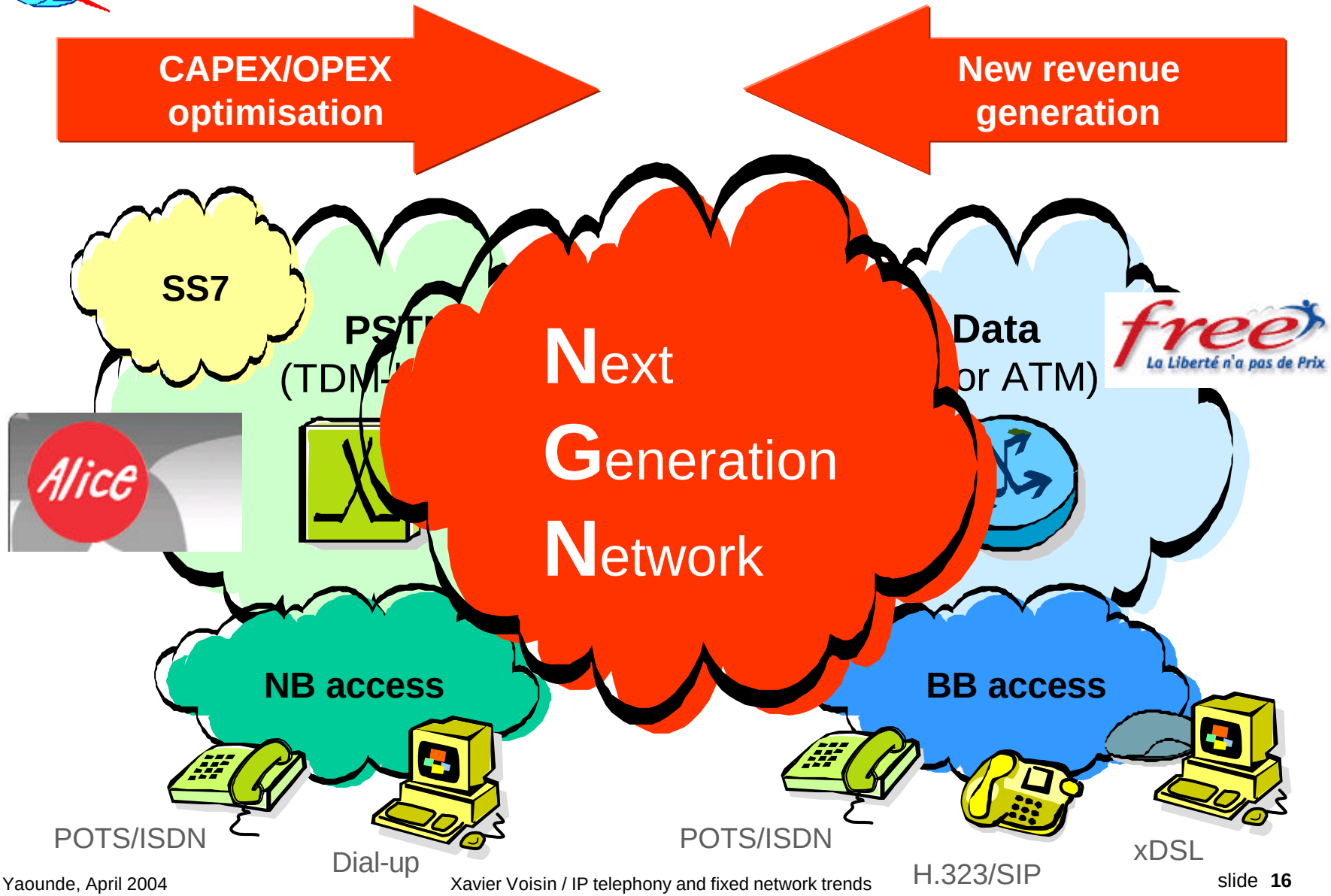
NGN Architecture Principles (3)
Layered Model



NGN Architecture Principles (4)
Standards-based Components



Main Drivers for Network Evolution

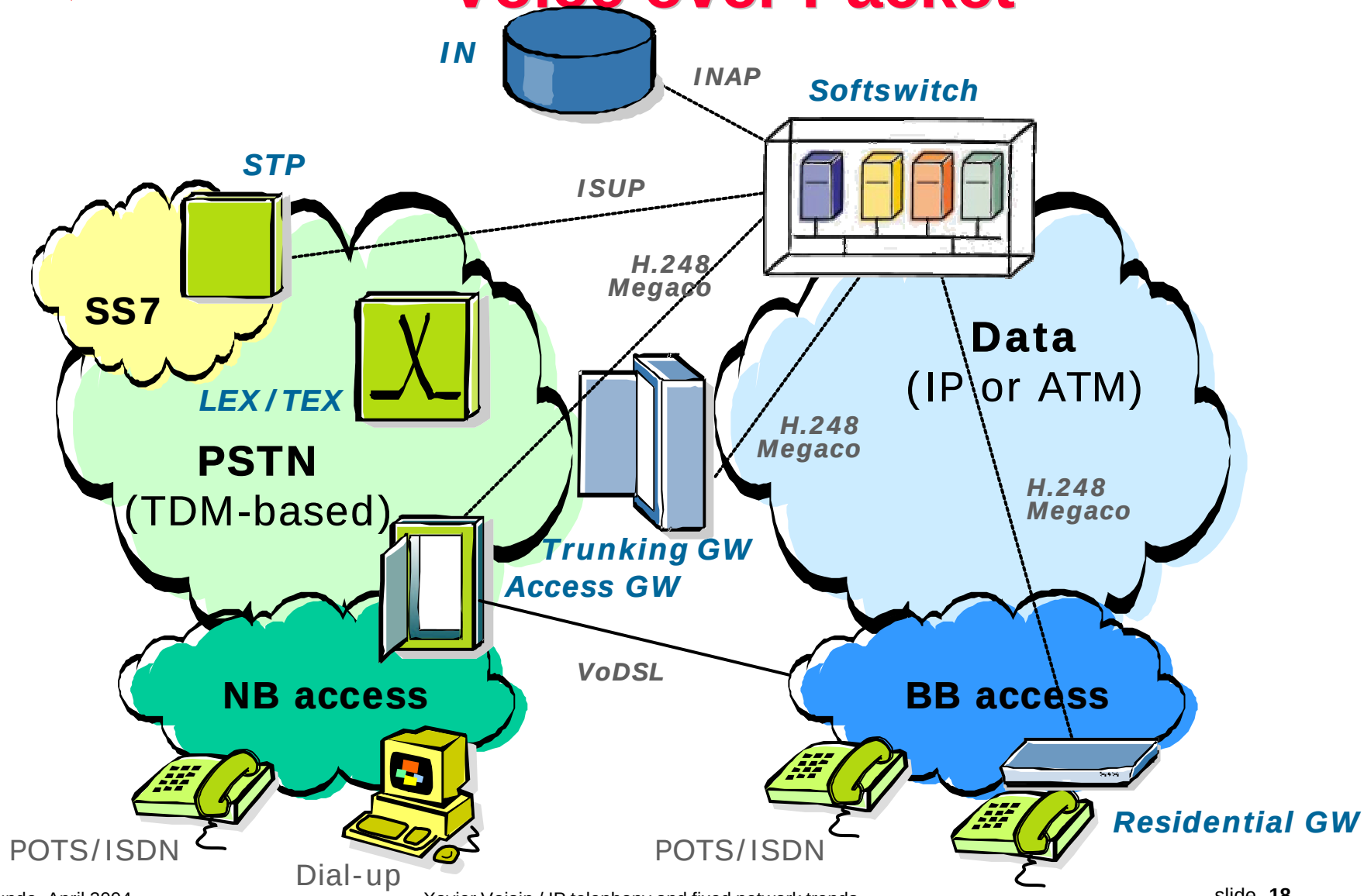


About “Alice” and “Free”

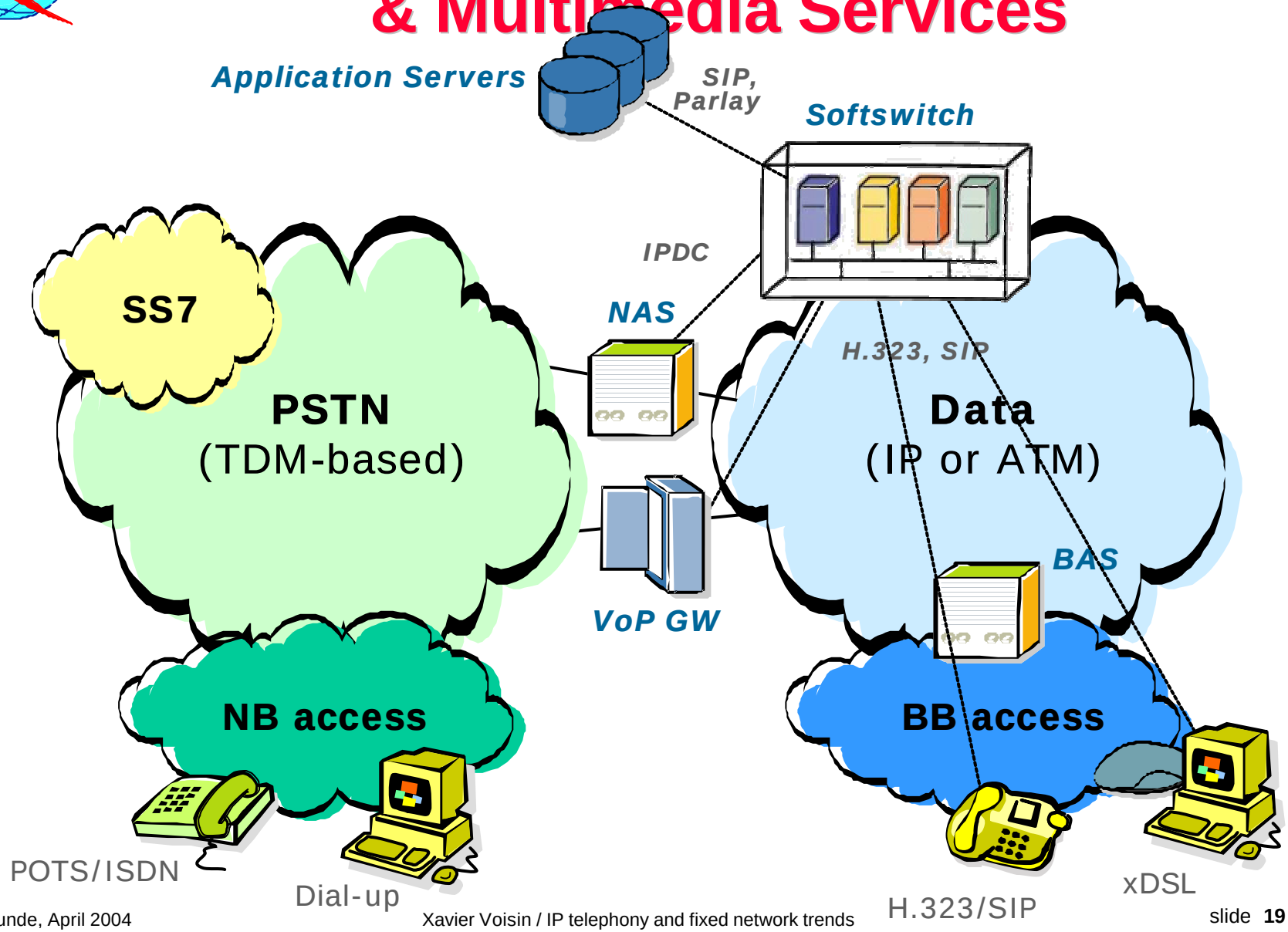
- **Needs NGN**
  - to reduce operating cost to be more competitive in price
  - extend to multimedia real time communication services

- **Needs NGN**
  - to control service delivery (e.g. resource reservation) and end to end QoS
  - extend telephone services to fax, modem and special services
  - grow its prices and revenues with a better quality service delivery scheme

PSTN Evolution Towards Voice over Packet

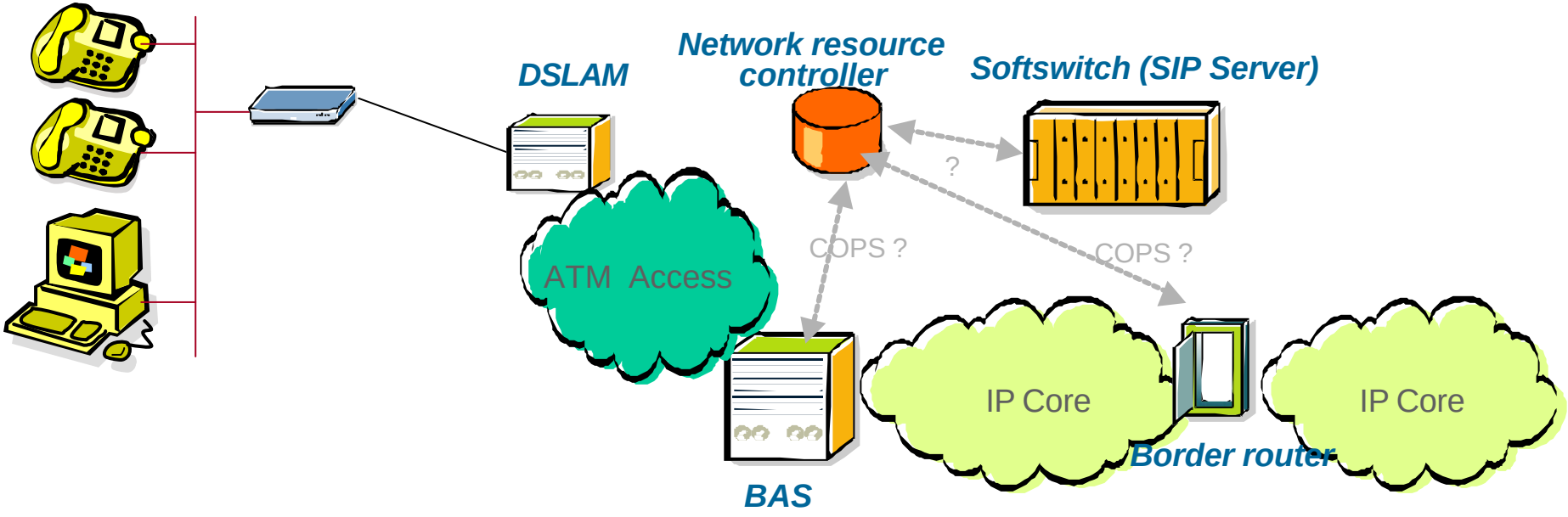


IP-based Telephony & Multimedia Services



Service related control of QoS
What about access and core ?

- **Access**
  - Mono domain
  - ATM Multiservice EBR/CBR VCs
  - Admission Control is a must
  - Links with Security and NAT
- **Core**
  - IP Diffserv not enough
  - MPLS for guaranteed traffic flows
  - Is admission control needed ?
  - Multi-domain is a must for public services



Still a nmber of ? - More for research & standardization

The convergence is in Next Generation Network

- **A public communication network with:**
  - A **layered architecture**
    - Clear separation of **access/transport**, **media**, **control** and **services** layers
    - **Standards-based** components
    - **Open interfaces** between the layers
  - A common, **packed-based** infrastructure
    - Seamless control of **multiple transport technologies** (IP, ATM)
    - **Interoperability** with existing networks (circuit and packet, fixed and mobiles)
  - New **revenue-generating** services
    - Leveraging **broadband access**
    - Leveraging **mobile access as well**
    - **Voice**, **data** and **multimedia** applications
    - **Open Service Provisioning** model

NGN generating value

Where is the value ?

- in person-to-person real time communications
- in secured person-to-person or person-to-machine communications
- in ability to reach people, customers, consumers everywhere, anytime
- in delivering valuable services and applications
- in providing access to mass users
- in networks that enable the delivery and charging of profitable services with the appropriate level of quality

NGN drivers

- **Services and Applications are the main drivers**
- **NGN will not replace, but extend PSTN and Internet over time**
  - Capitalise on the **installed base** to reduce CAPEX
  - Optimise **network operations** to reduce OPEX
  - Introduce **new applications** for new revenues
- **New advanced and MM services are key differentiators for network revenue generation**
  - Allowing Network Operators to act as Application Service Provider and Retailer
  - Allowing Network Operators to offer advanced communication services to Enterprises helping them to better reach the consumer
  - NGN MM is a way to generate revenues from broadband accesses

3 - The CoE workshop on NGN economics

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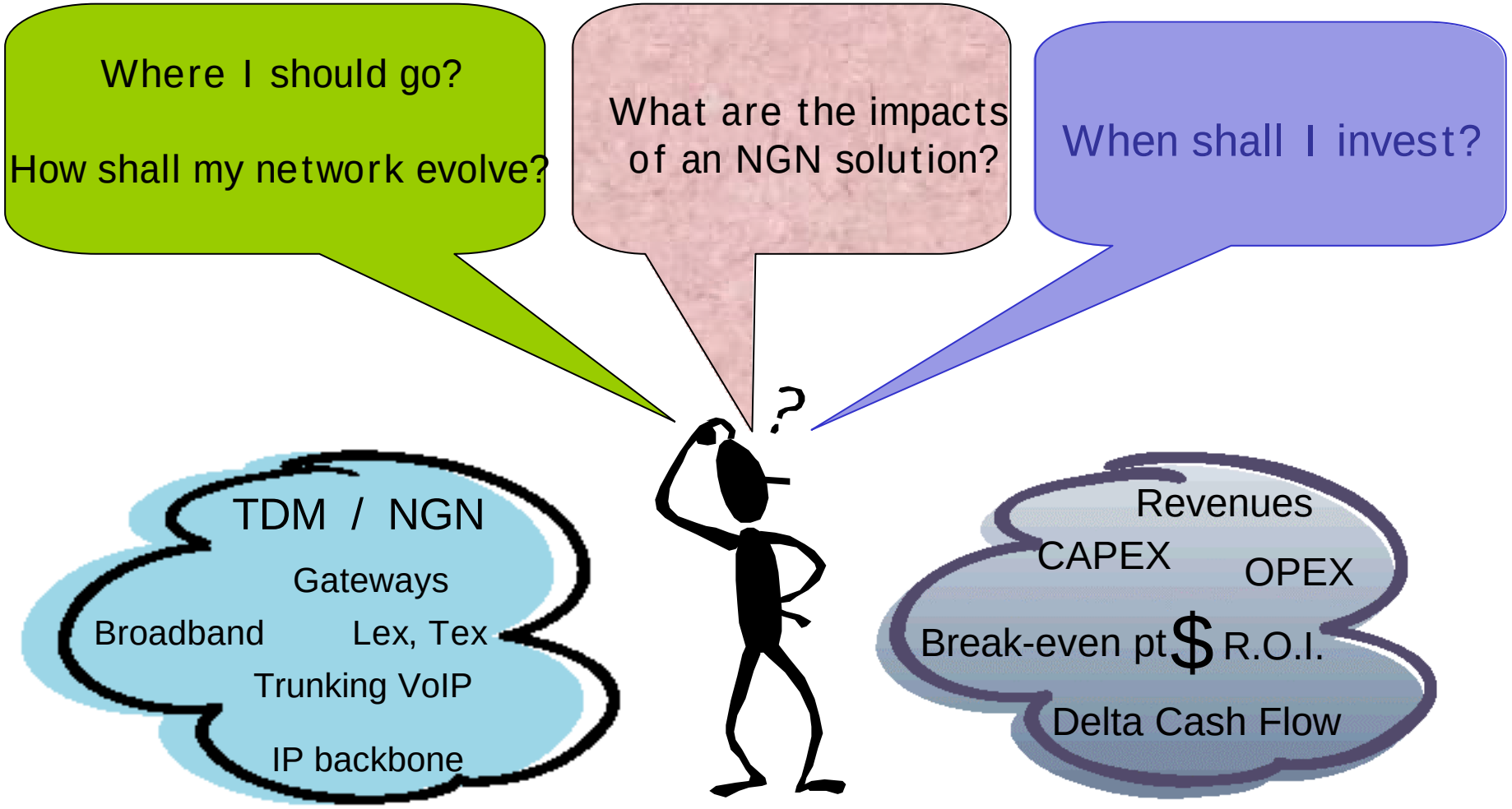
Why NGN Economics?

To answer operator requests about economics for NGN



NGN Economics
Operator's questions

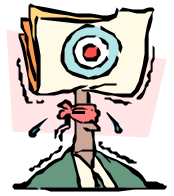
- **Operators may be facing several and not always exclusive issues concerning their market and their network**
  - Network expansion
  - Competition aspects, both for incumbents and new entrants
  - Regulation
  - New services introduction
- **Some important questions may arise**
  - if I follow that strategy, will the business be profitable?
  - Which from the available solutions is the best one for my business?

NGN Economics may answer them by showing the value of the business and the general solutions deployment trend to be followed

CoE Workshop on NGN Economics

- **The workshop has been built as part of a cooperation agreement between Alcatel and ITU-D for the Centers of Excellence CoE**
  - Already performed in several places (Bratislava, San Jose de Costa Rica and Damascus)
  - Further workshop planned for Dakar and Tunis, under discussion for East Africa and Eastern Europe
- **Built in three major parts based on Alcatel business evaluation and network evolution modeling tools**
  - NGN economics for PSTN evolution
  - NGN services and business modeling
  - ADSL deployment

NGN Economics for PSTN Evolution

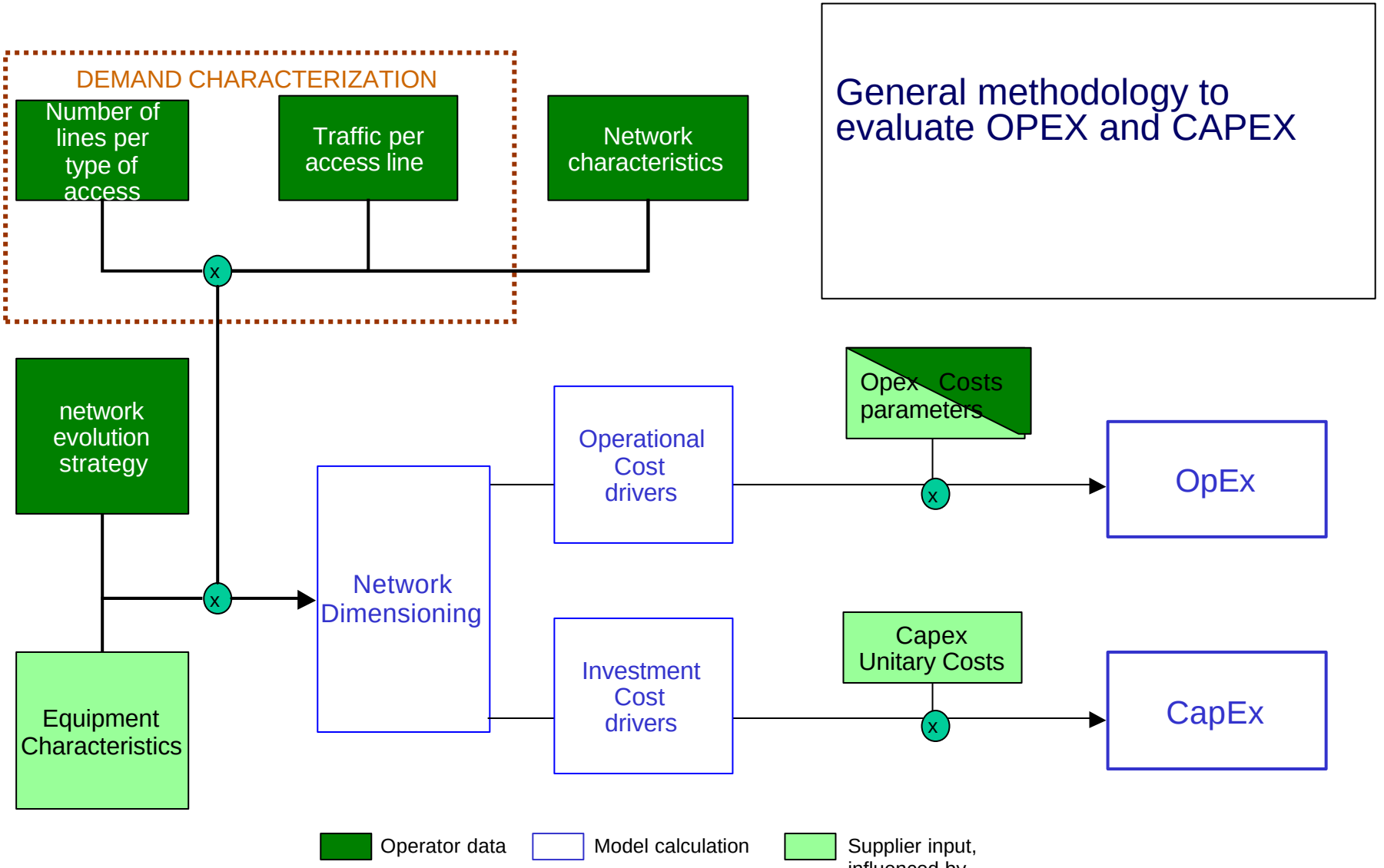


- **Purpose of the Economics for PSTN evolution**
  - identify the various cases encountered by operators
  - describe the driving economic factors
  - show and demonstrate an evaluation methodology
  - evaluate some PSTN evolution cases

Based on a comprehensive input collection, network dimensioning, architecture, Capex and Opex modeling tool

Keeping in mind that cases and their conclusions might be quite different from one operator network to another

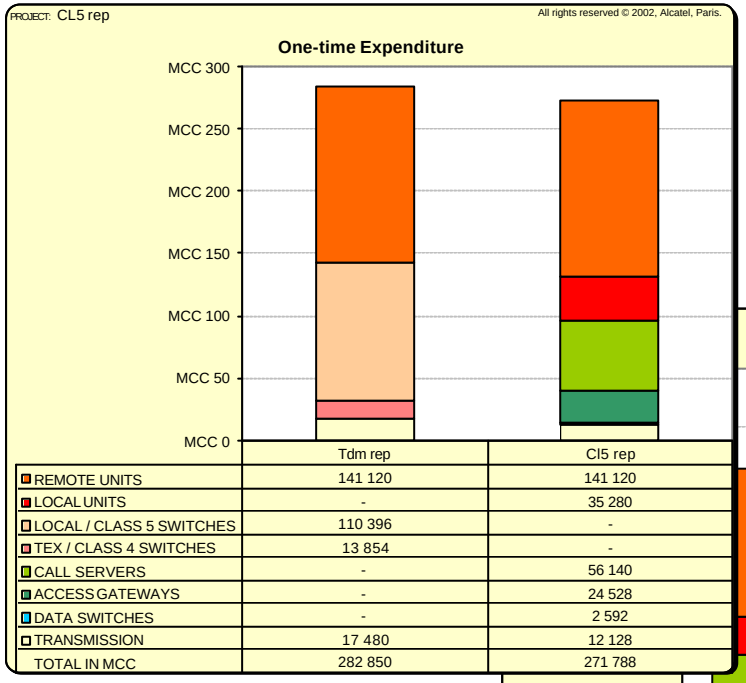
Model Architecture



Studied PSTN Evolution cases

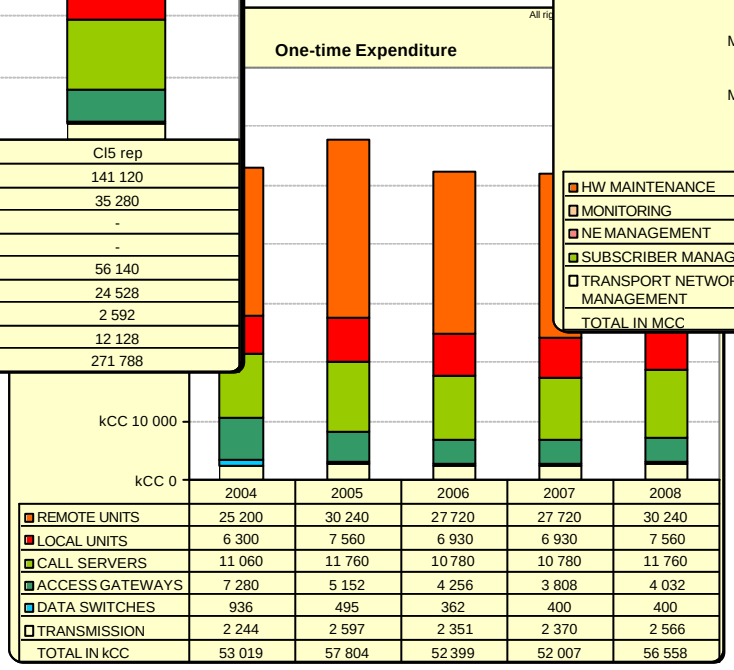
- **NGN CLASS 4 (transit level)**
  - concerns only the evolution of the transit network to NGN
  - transit exchanges (TEX) are replaced/migrated to NGN
  - existing local exchanges (LEX) supporting subscribers remain untouched (kept in TDM technology)
  - can be understood as a partial evolution
- **NGN CLASS 5 (local level)**
  - local exchanges (LEX) are replaced/migrated to NGN
  - this case implies also a Class 4 NGN part

Examples of Outputs



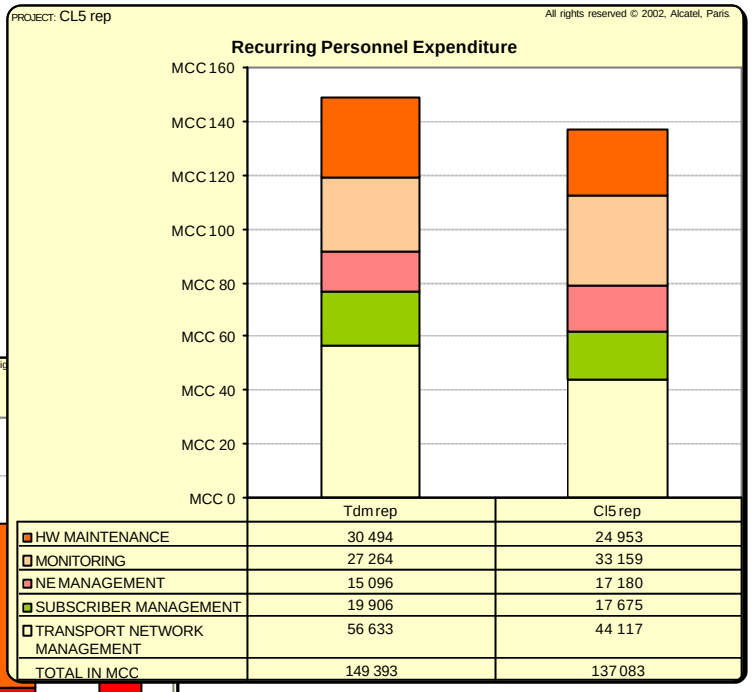
	Tdm rep	Cl5 rep
REMOTE UNITS	141 120	141 120
LOCAL UNITS	-	35 280
LOCAL / CLASS 5 SWITCHES	110 396	-
TEX / CLASS 4 SWITCHES	13 854	-
CALL SERVERS	-	56 140
ACCESS GATEWAYS	-	24 528
DATA SWITCHES	-	2 592
TRANSMISSION	17 480	12 128
TOTAL IN MCC	282 850	271 788

Capex



	2004	2005	2006	2007	2008
REMOTE UNITS	25 200	30 240	27 720	27 720	30 240
LOCAL UNITS	6 300	7 560	6 930	6 930	7 560
CALL SERVERS	11 060	11 760	10 780	10 780	11 760
ACCESS GATEWAYS	7 280	5 152	4 256	3 808	4 032
DATA SWITCHES	936	495	362	400	400
TRANSMISSION	2 244	2 597	2 351	2 370	2 566
TOTAL IN kCC	53 019	57 804	52 399	52 007	56 558

Capex / year



	Tdm rep	Cl5 rep
HW MAINTENANCE	30 494	24 953
MONITORING	27 264	33 159
NE MANAGEMENT	15 096	17 180
SUBSCRIBER MANAGEMENT	19 906	17 675
TRANSPORT NETWORK MANAGEMENT	56 633	44 117
TOTAL IN MCC	149 393	137 083

Personnel expenditures

NOTICE: the data shown in this slide are not representative of any real Case

NGN services business modeling

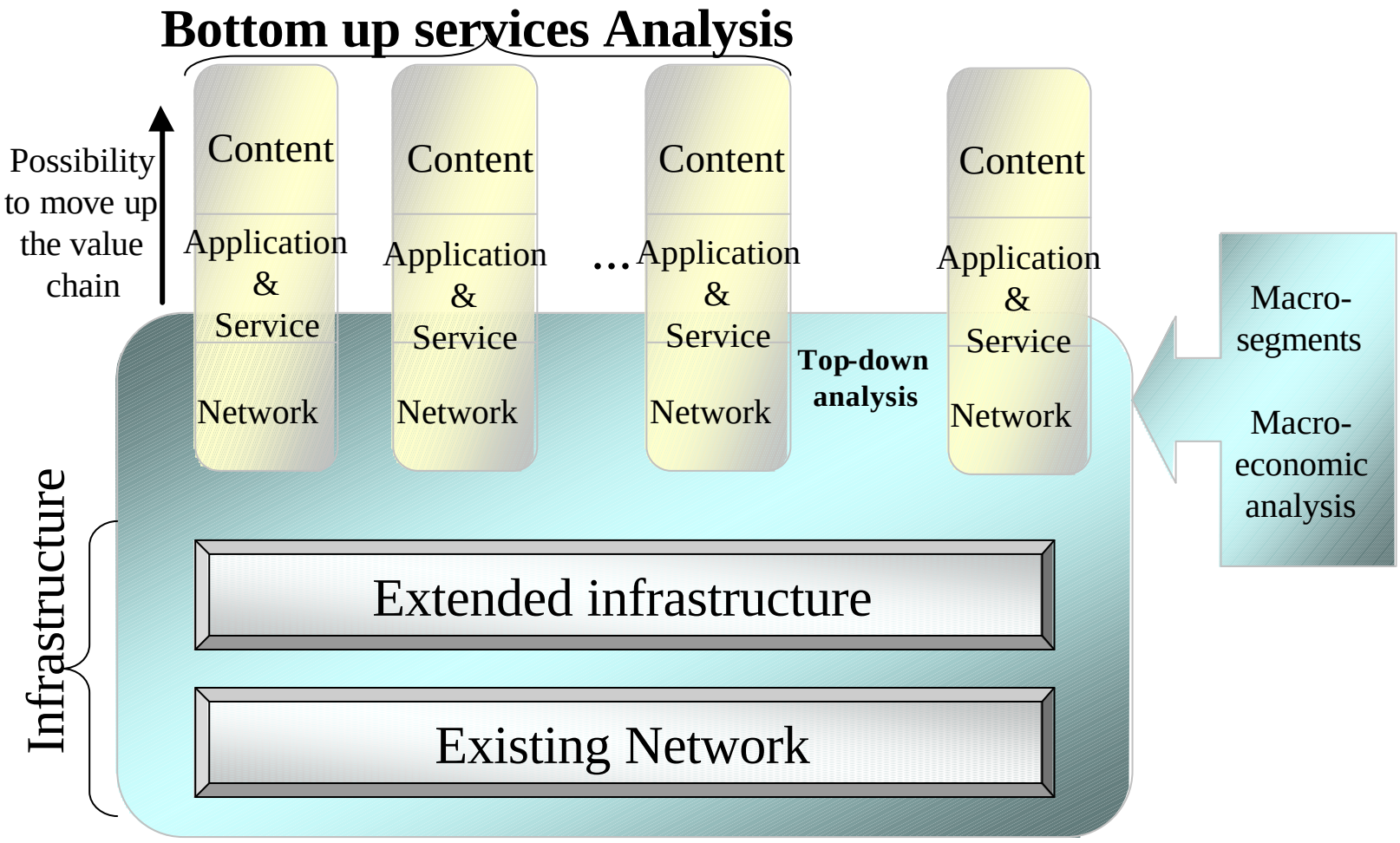
Purpose of NGN services business modeling

- Mainly concern new services over broadband (DSL) access with the key business issues
- finding ways to add value to the basic fast internet service of DSL accesses?

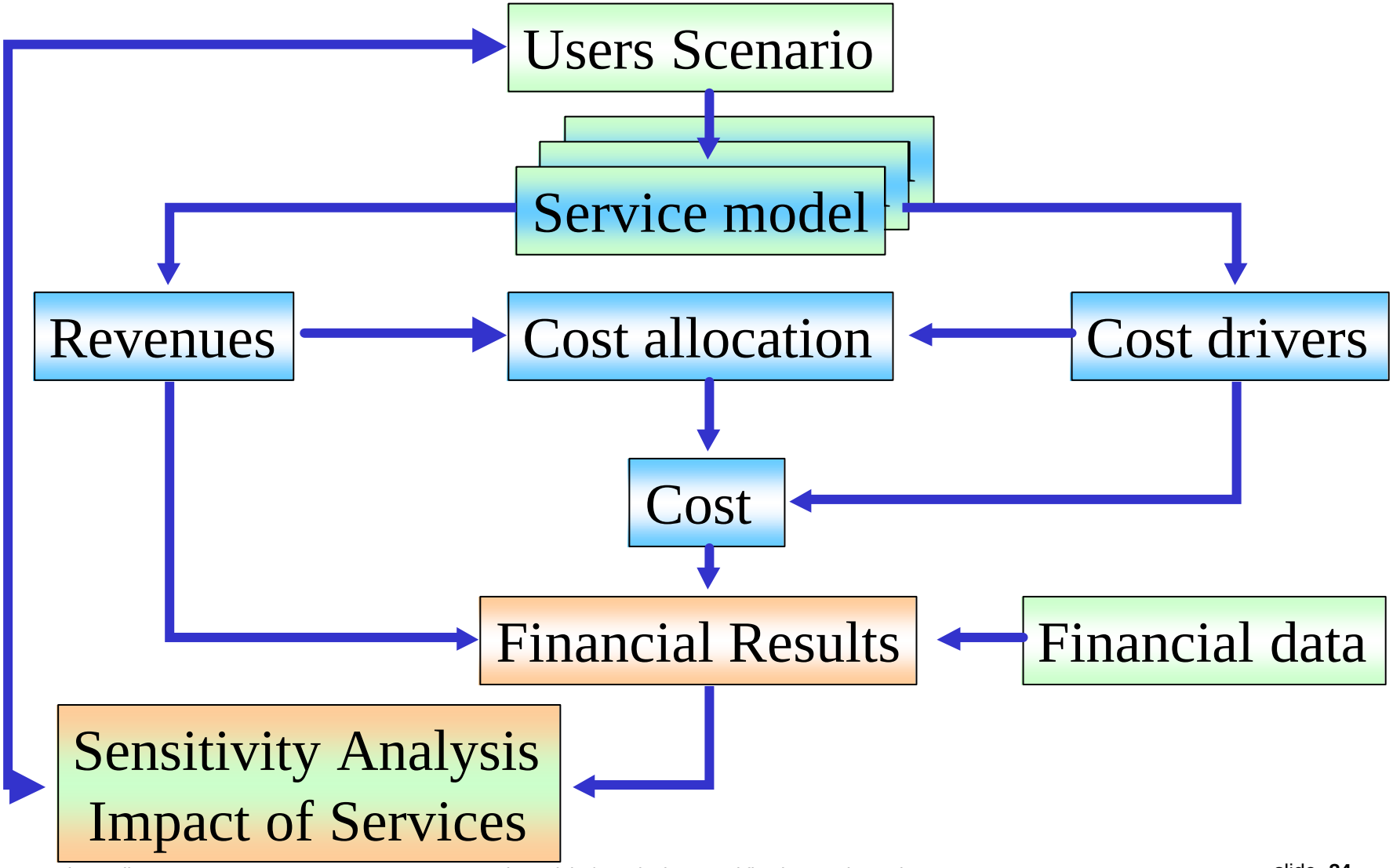
Session include

- in depth anlysis of various IP based or NGN related services
  - which services ?
  - for which customers ?
  - which potential revenues?
  - Where are the costs, who are the other actors, is it impacting another profitable service ?
- modeling the business generated by new services, using the Alcatel tool with scenarios built by the participants (work groups)

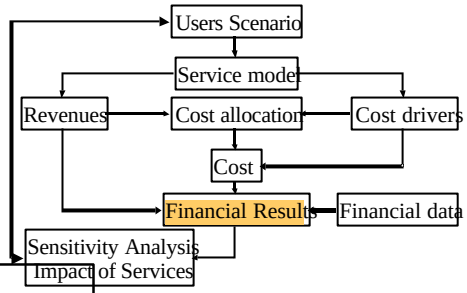
Service modeling and Value Chain

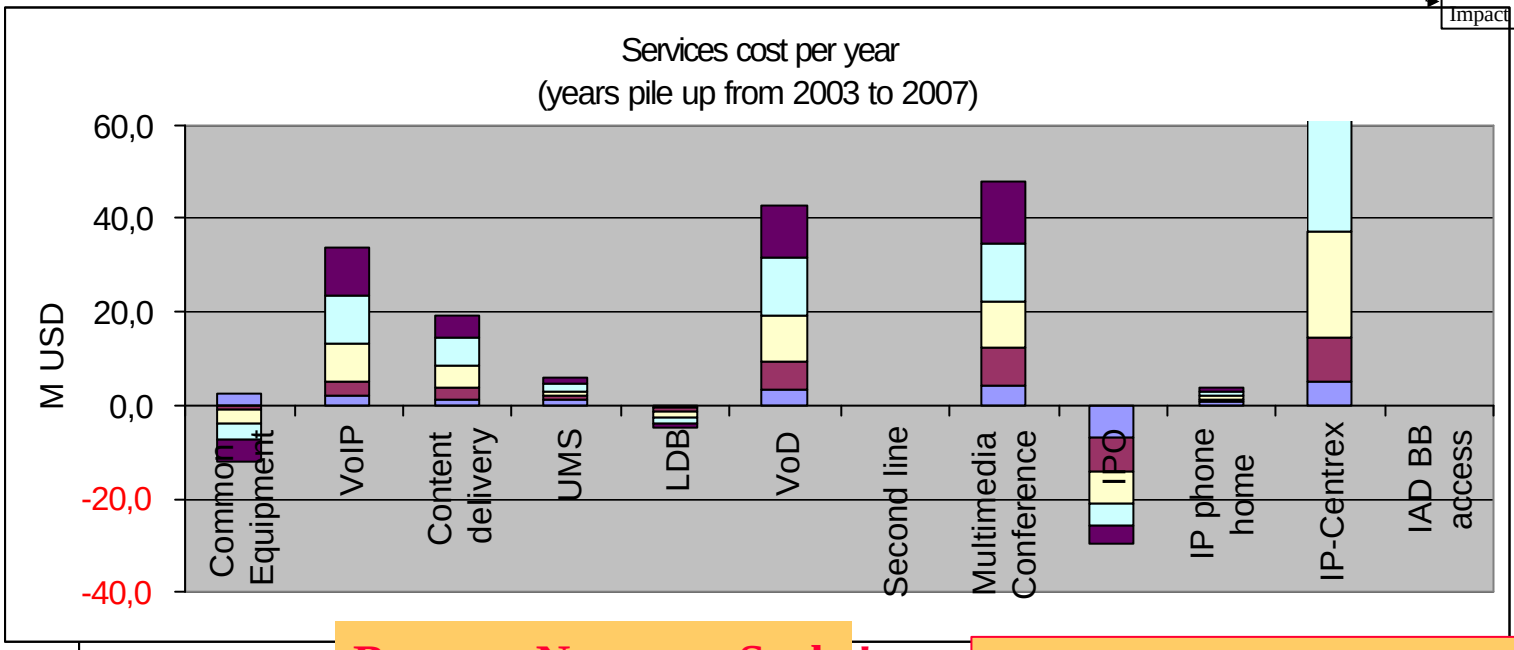


Model Architecture



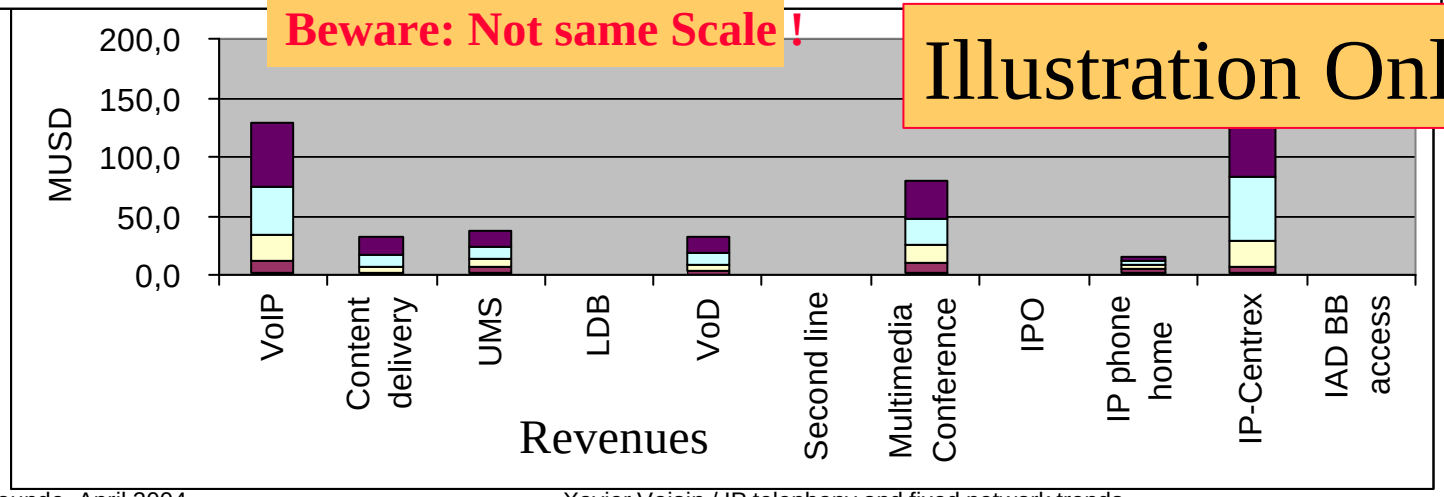
Example of results





Beware: Not same Scale !

Illustration Only



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