ALCATEL

ARCHITECTS OF AN INTERNET WORLD

# Optimising 3G Migration

**Sub-Regional Seminar on IMT-2000**
**Warsow, 2-4 October 2001**

Marie FROMENT
Marketing Manager
Alcatel Mobile Network Division
marie.froment@alcatel.fr

# Optimising 3G Migration
# Outline

I - 3G migration strategies: challenges & drivers

II - 3G roll-out strategies

III - Preparing the successful launch of UMTS

# Migration from GSM to 3G

## *Market* drives technology


End-users Services

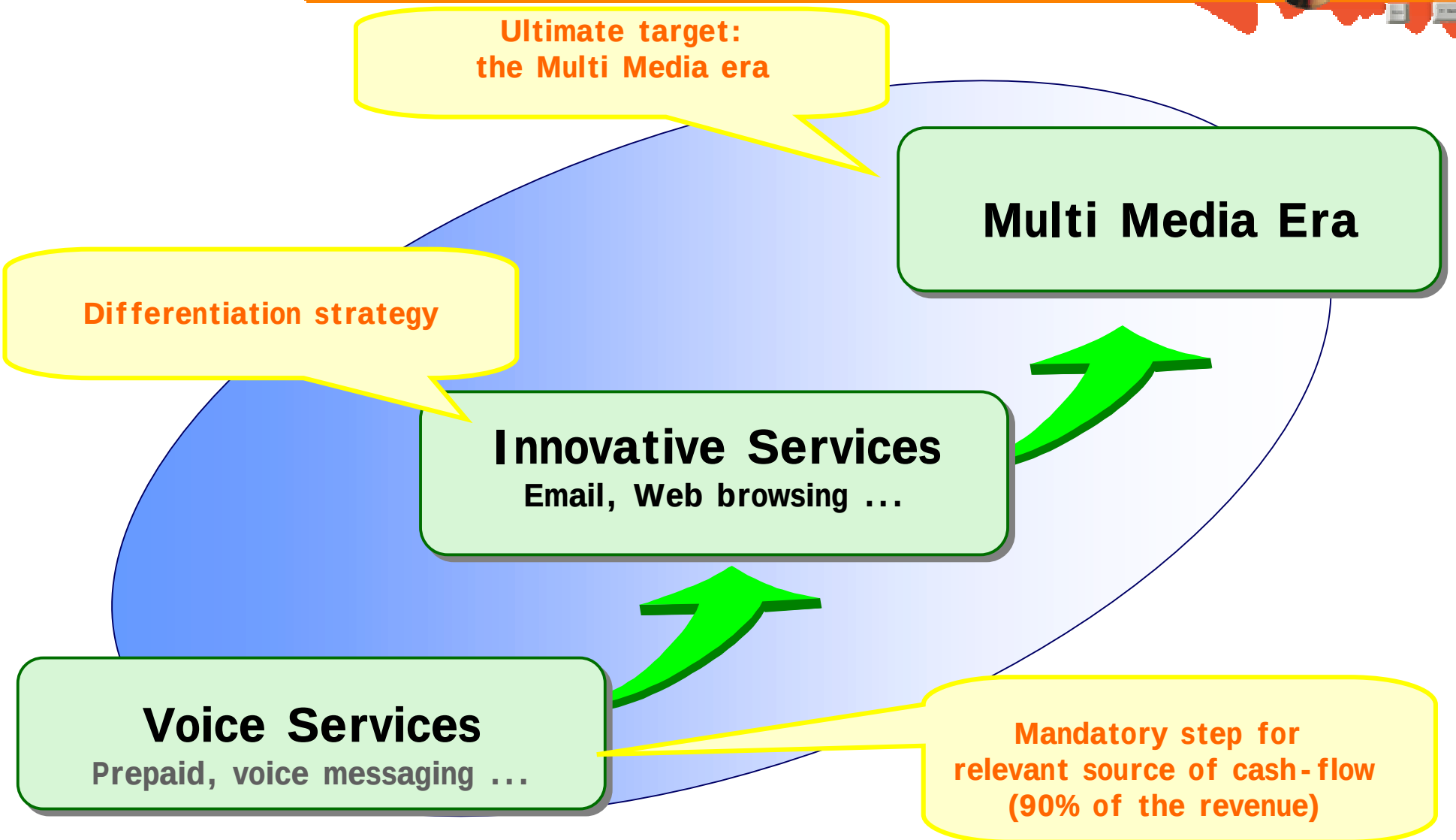
Mobile Service Providers

**CONTINUITY**


End-users Services

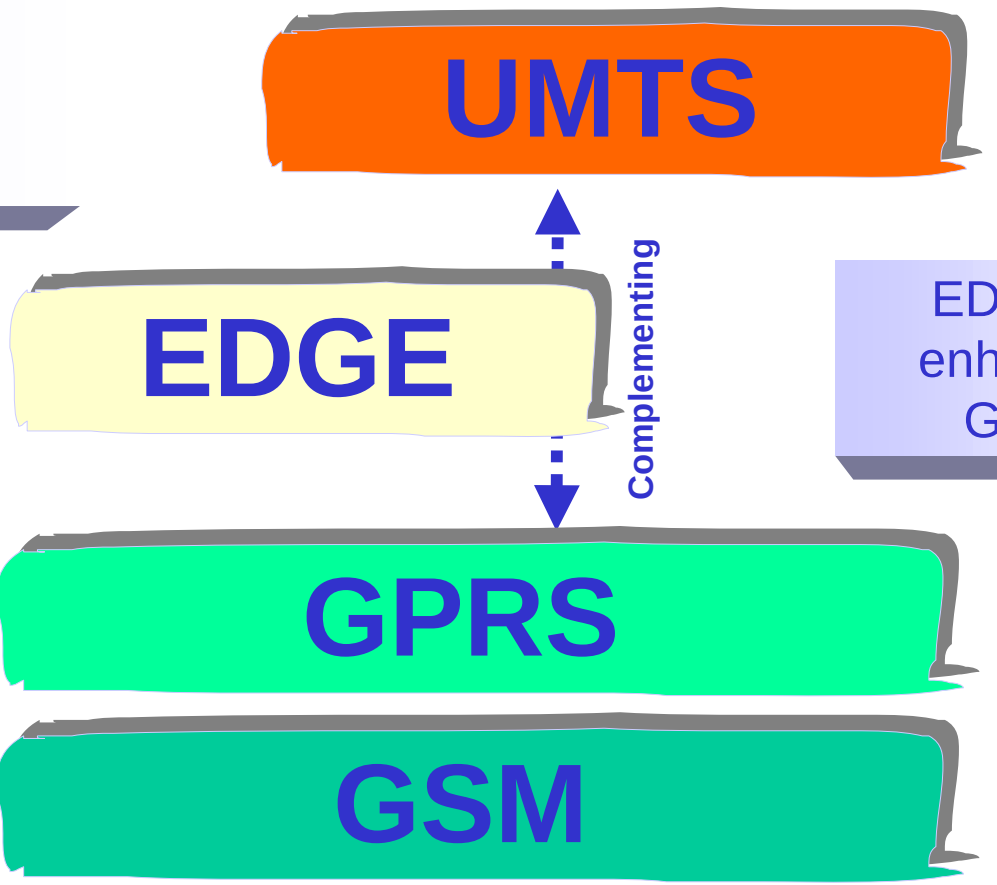
Mobile Service Providers

# Migration from GSM to 3G
## *Applications strategy* standpoint



# Migration from GSM to 3G
## *Technology & framework* standpoint

UMTS is THE ultimate technology for mobile multimedia




EDGE is enhancing GPRS

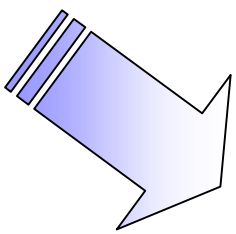
GPRS is key to bring new value-added applications

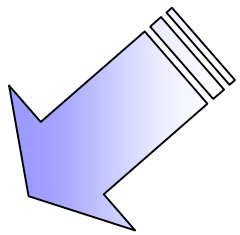
# Migration from GSM to 3G

## *2 driving forces* impact 3G roll-out strategies

**Marketing**
**Strategy**

**Regulation**
**Constraints**





3G roll-out strategies

*Leveraging on Field reality*

# Optimising 3G Migration
# Outline

I - 3G migration strategies: challenges & drivers

II - 3G roll-out strategies

III - Preparing the successful launch of UMTS

# Assessing roll-out strategies

## *Operators strategic approach*

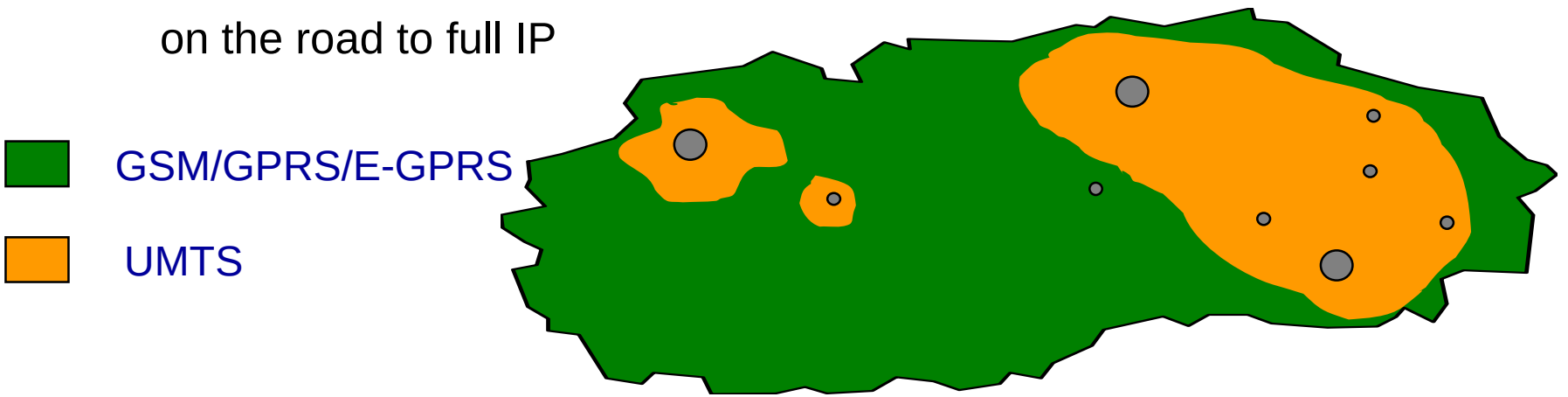
| Aggressive | Opportunist | Defensive |
|---|---|---|
| Incumbent GSM | Green-field<br>Incumbent GSM | Incumbent GSM |
| Leading position | Challenging position | Late entrant |
|  |  |  |
| *UMTS where needed complemented by GSM/GPRS* | *UMTS everywhere by any means (MVNO, net' sharing…)* | *UMTS only for mass-market phase* |

# Assessing roll-out strategies
## *Aggressive* strategy

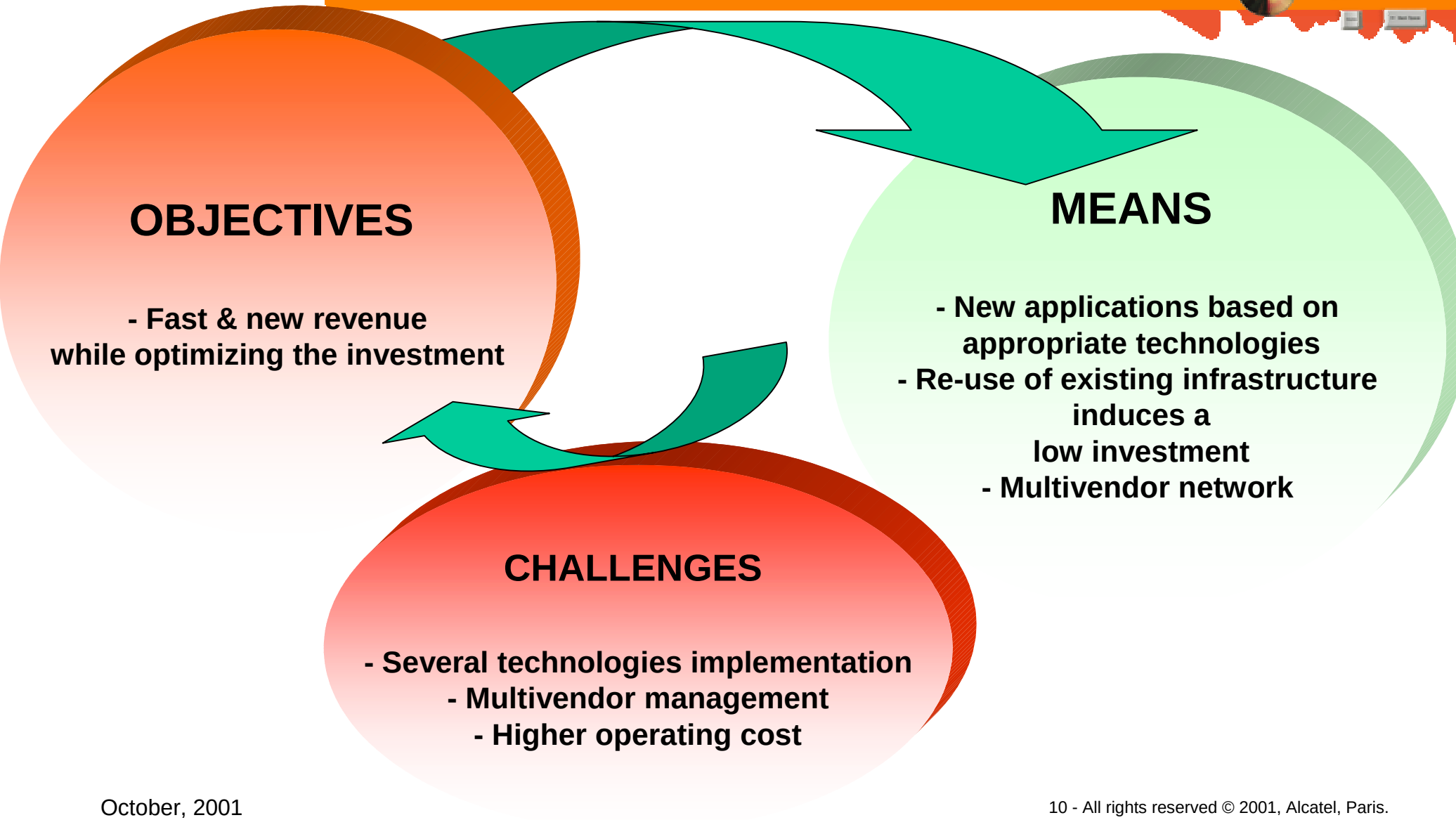
**Start with UMTS For Urban Areas**
**Leverage on GSM/GPRS For Coverage**

- Deployment scenario in 3 major steps
  - 1st step: Secure UMTS launch ➔ 2001/2002
  - 2nd step: Optimize network architecture ➔ 2002/2003
  - 3rd step: Maximize Multimedia revenue ➔ 2003/2004

on the road to full IP



# Assessing roll-out strategies
## *Aggressive* strategy -2/2-

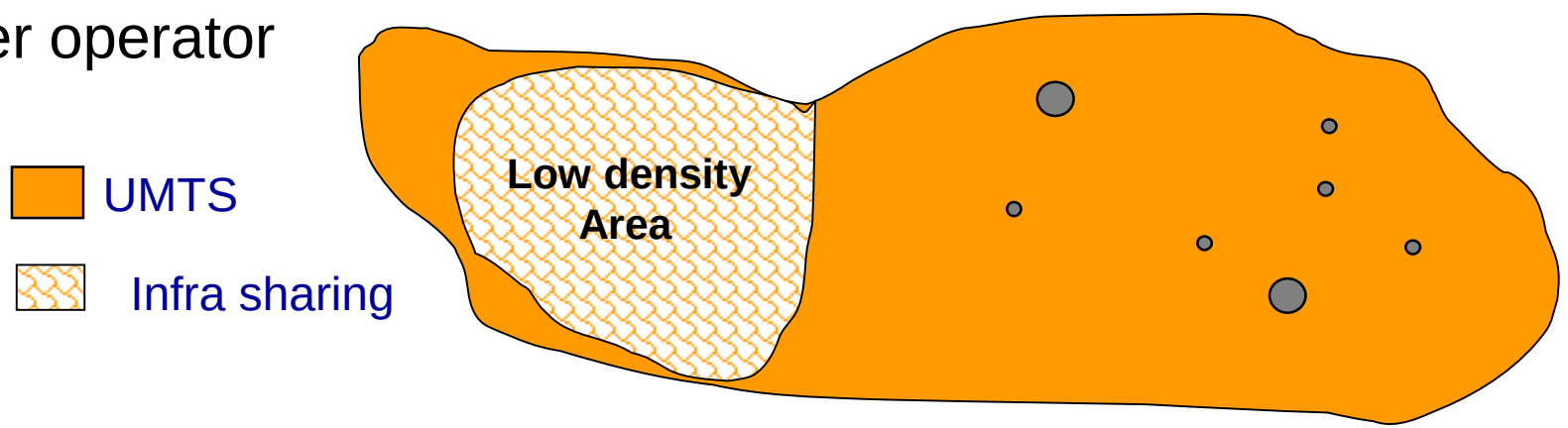


# Assessing roll-out strategies
## *Opportunist* strategy

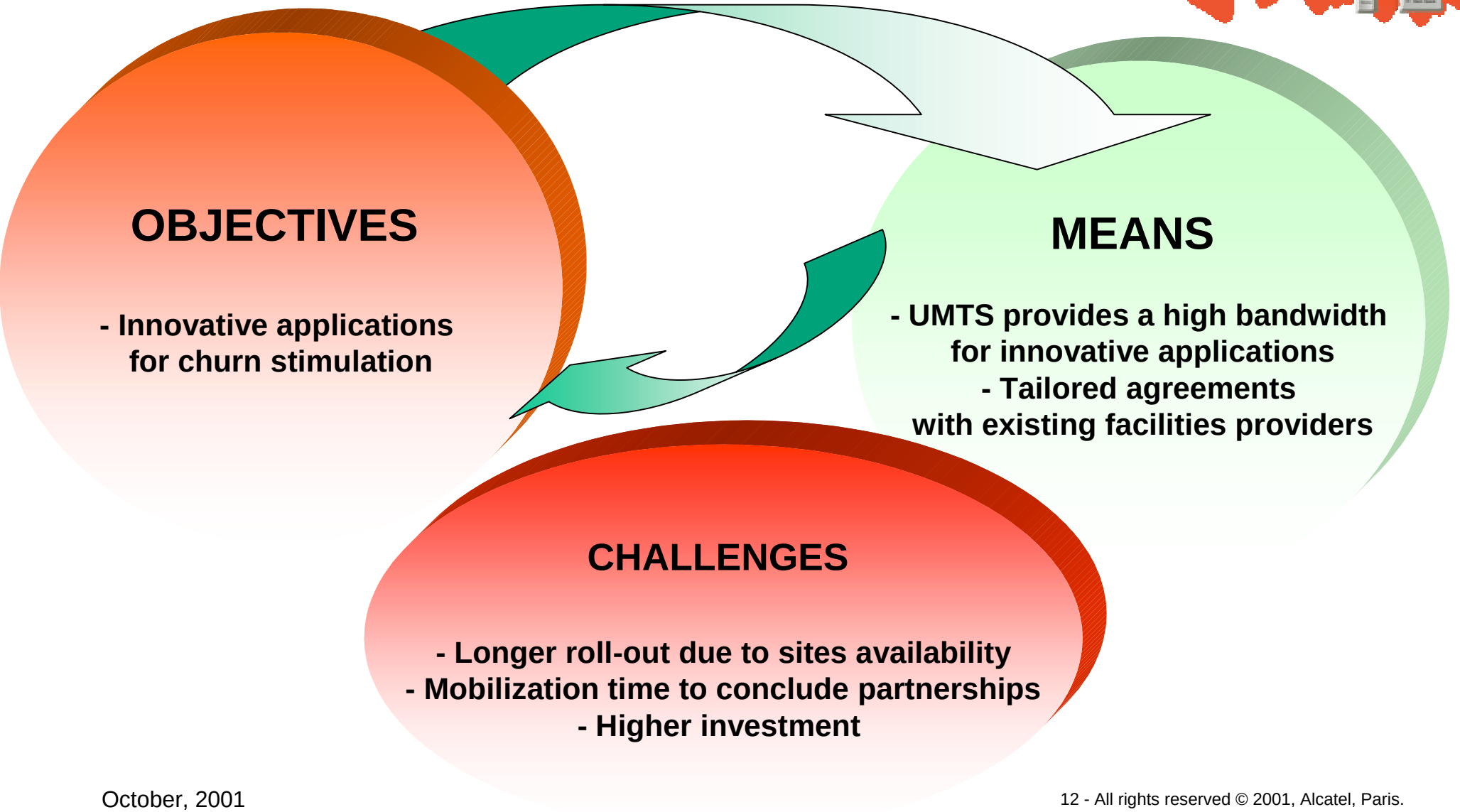
**Fast coverage of the hot spots**

**Target UMTS National coverage**

- Offer a minimum coverage via
  - Hot spot first / National roaming and Infrastructure sharing agreements
  - Complete or partial outsourcing making use of Tower companies proposals
- Explore the MVNO opportunity with strong agreement with another operator

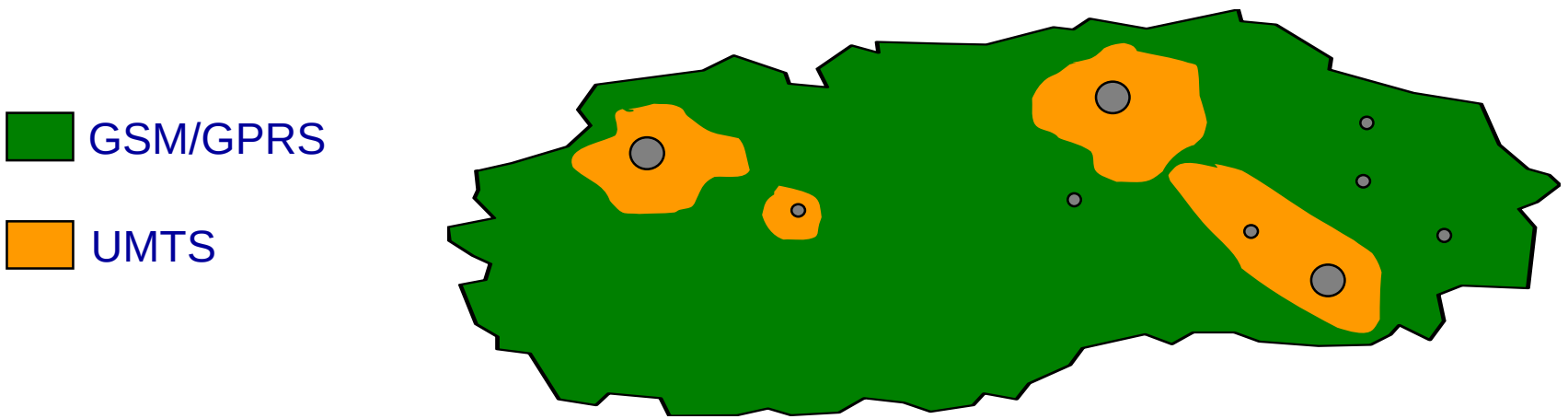


# Assessing roll-out strategies
## *Opportunist* strategy -2/2-

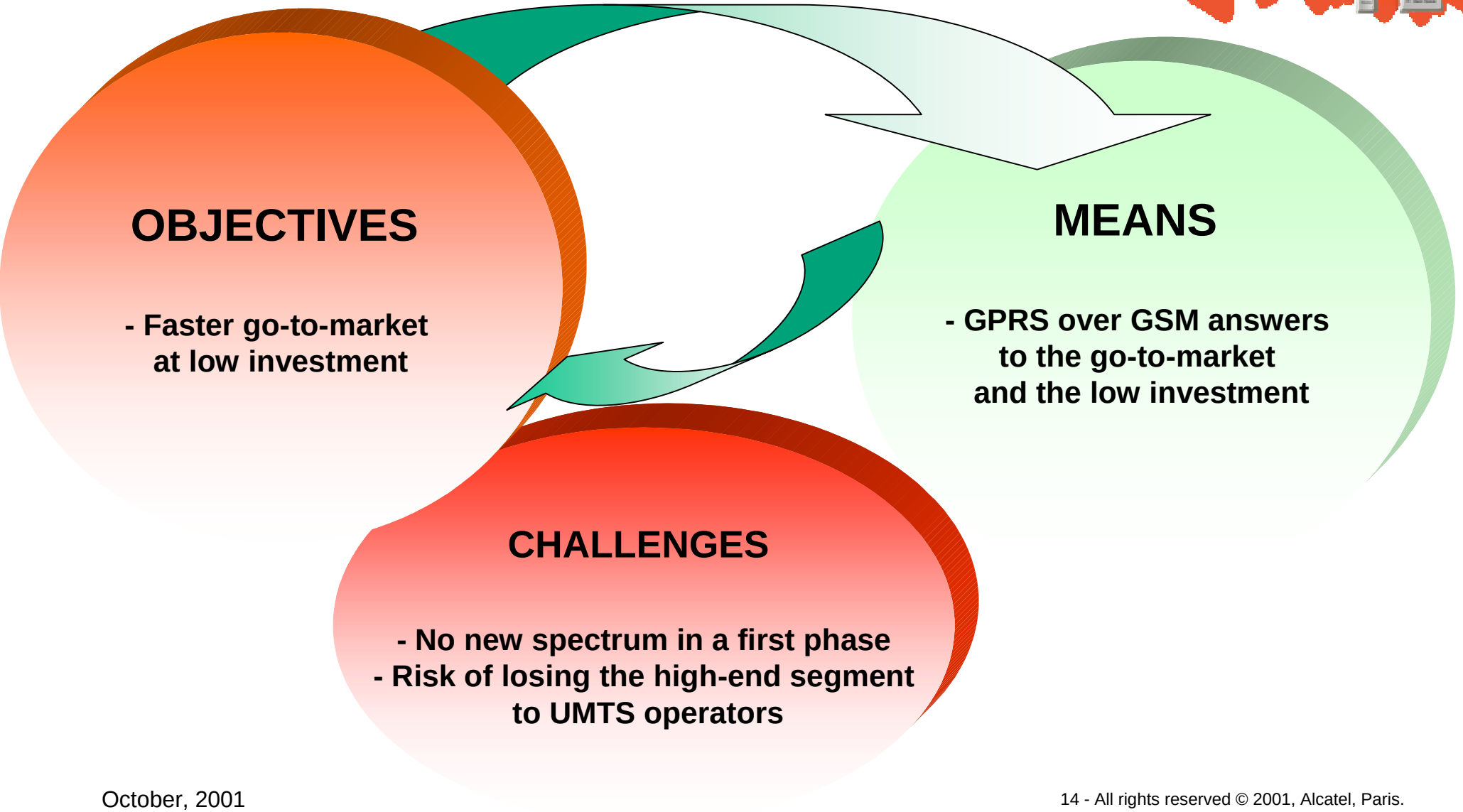


# Leverage on GSM/GPRS/E-GPRS as substitution to UMTS
# Introduce UMTS in a second phase

- Make the best use of GSM & GPRS for rural areas
- Cover the hot spots and major cities with UMTS for high traffic capture



# Assessing roll-out strategies
## *Defensive* strategy -2/2-



# Outline

I - 3G migration strategies: challenges & drivers

II - 3G roll-out strategies

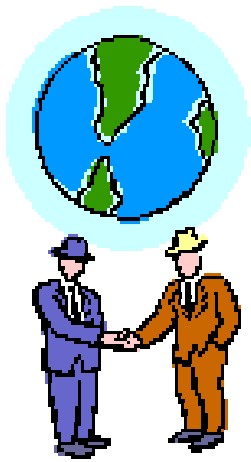
III - Preparing the successful launch of UMTS

- ↓ Network Sharing
- ↓ Multistandard Approach

# *Network sharing* alternatives
## Basic criteria influencing

- Regulation aspects:
  - Sharing of frequencies
  - Sharing of core network
  - Maximum geographical size of the shared area

- Business agreement aspects:
  - Service Level Agreement
  - Network planning and capacity enhancement
  - Daily network operation



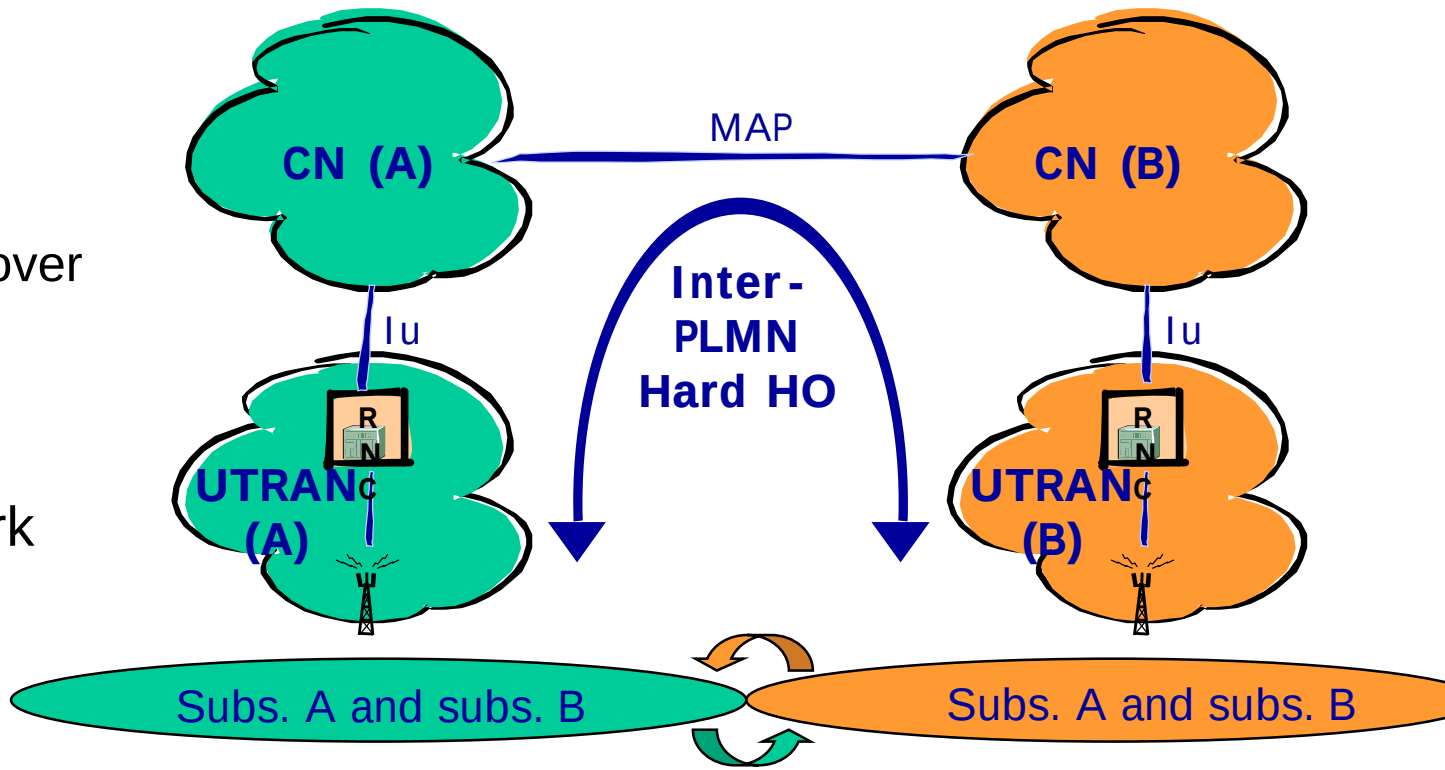
- Network Sharing solutions:
  - Geographical split
  - Netco model
  - Site sharing & Full RAN sharing

# *Network sharing* alternatives
# Geographical split (1/2)

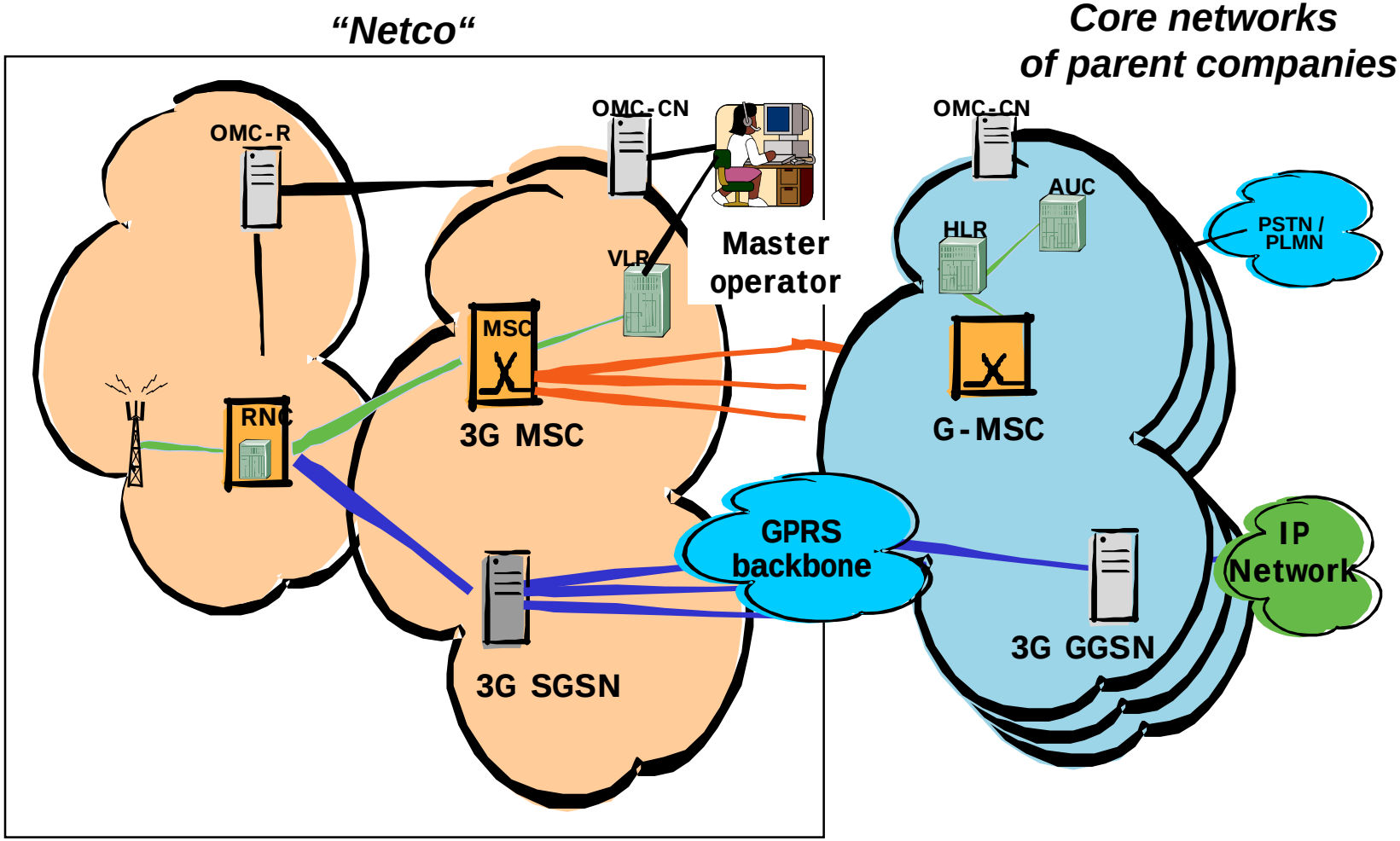
- National Roaming between partners
  - Provides access to services, outside the home PLMN (allows subscribers to camp on cells of the visited PLMN)
  - Roaming can be allowed on a per area basis:
    - National Roaming may be forbidden e.g. in areas covered by all partners (e.g. dense areas in Germany)
- Inter-PLMN hard handover between partners
  - To maintain established calls when the subscribers is moving from one PLMN to another one

# *Network sharing* alternatives
## Geographical split (2/2)

- Each operator has his own network with split of geographical area
- Inter-PLMN hard handover and cell re-selection avoids service interruption at network borders
- National Roaming on a per area basis to restrict roaming to agreed areas only



# *Network sharing* alternatives
## Netco Model (1/2)



# *Network sharing* alternatives
# Netco Model (2/2)

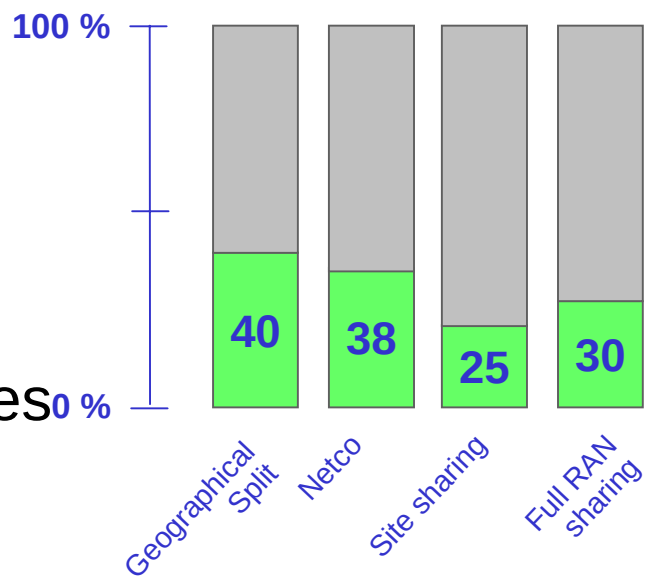
- Each “parent company”:
  - Has its own subscribers and own PLMN identity
- The Netco:
  - Provides radio coverage
  - Does not have its own subscribers
  - Has its own PLMN identity
  - Is visited by roaming users from the parent companies
    - The Netco model is a particular case of the geographical split
- National Roaming agreements between Netco and parent companies

# *Network sharing* alternatives
## Site and Full RAN sharing

- Identified possible options for UTRAN sharing:
  - Site sharing:
    - Shared sites, masts, antennas, power supply, transmission
    - Shared cabinet housing separate Node B's
    - Separate RNC and OMC
  - Full RAN sharing:
    - Shared sites, masts, antennas, power supply, transmission
    - Shared cabinet housing 2 logical Node B's with shared O&M and Base Band
    - Shared RNC, one OMC with separate control of each operator over his resources (separate Performance, Fault and Radio Management).
- In all cases, each cell is dedicated to one operator (one PLMN id per cell)

# *Network sharing* alternatives financial benefits Macro-results

- Network sharing brings significant savings on network expenses
- It is an efficient way to cope with the “UMTS entry costs”
- Potential savings in % of network investment
  - For two similar operators
  - In the area shared
- Potential savings in network operation expenses are roughly related to the number of sites




All results and figures by Alcatel MND Strategic Marketing

Alcatel added-value is to fine tune these general results to specific cases, taking the right criteria into account

I - 3G migration strategies: challenges & drivers

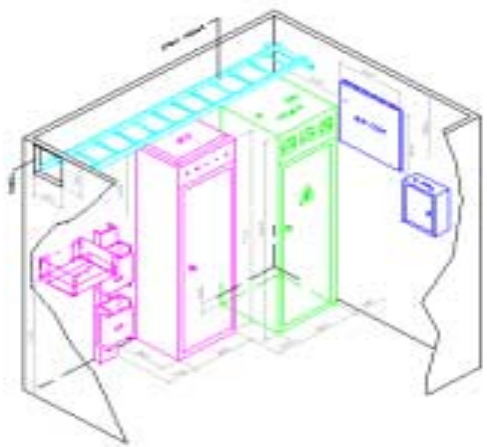
II - 3G roll-out strategies

III - Preparing the successful launch of UMTS

- Network Sharing
- Multistandard Approach

# *Multistandard* approach
# *True Multi-standard*:The best site optimization

- Issue: Introduce UMTS on existing sites with minimum impact



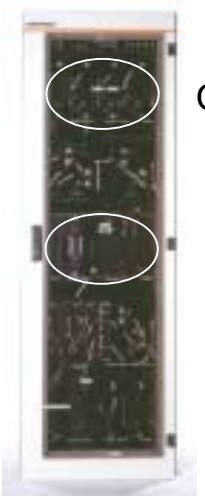
- Space floor availability
- Power supply requirement
- Antenna systems restrictions

⇨**Several solutions**

(site reconfiguration, new sites…)

- Best scenario : Multi-standard Base Station for GSM densification & UMTS introduction

**All EVOLIUM™ Base stations launched for GSM integrate UMTS modules**



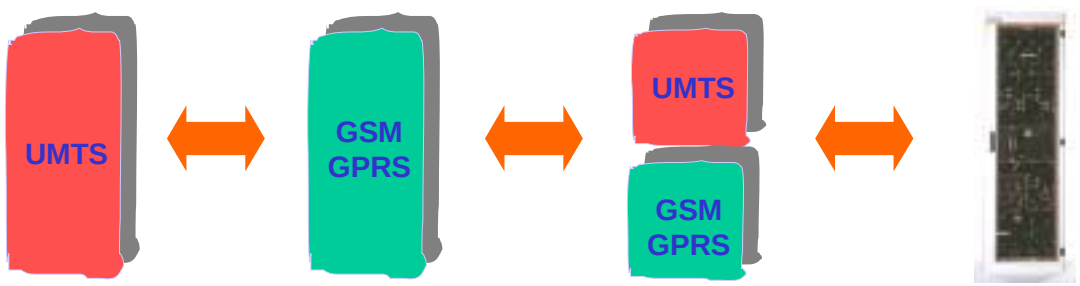
GSM/EDGE TRX

UMTS modules

# *Multistandard* approach
# *True Multi-standard*:The best site optimization

- Mixing UMTS and GSM module is not enough : configuration like 3x2 GSM + 3x1 UMTS are not applicable everywhere

- TRUE long-term benefits in multi-standard base stations rely on:
  - Maximum usage of common modules & spare parts
  - Similar equipment practice for GSM/GPRS and UMTS
  - Flexibility between full-GSM, full-UMTS or mixed GSM/UMTS




- Meaning that multi-standard can answer both GSM networks improvement / modernization and UMTS roll-out challenges

# *Multistandard* approach
# No compromise on *radio* performance

## Multi-standard base stations brings TRUE long-term benefits if

- GSM capabilities are at the state-of-the-art (radio power, coupling losses, sensitivity, filters fighting GSM/UMTS interferences, numb ck etc.)

- UMTS capabilities are really future-proof, meaning
  - True radio characteristics (e.g. power)
  - Multi-carrier capabilities
- Meaning that multi-standard can answer both GSM networks improvement / modernization and UMTS roll-out challenges

# *Multistandard* approach
# *Core Network* Evolution

CIRCUIT Domain

PACKET Domain

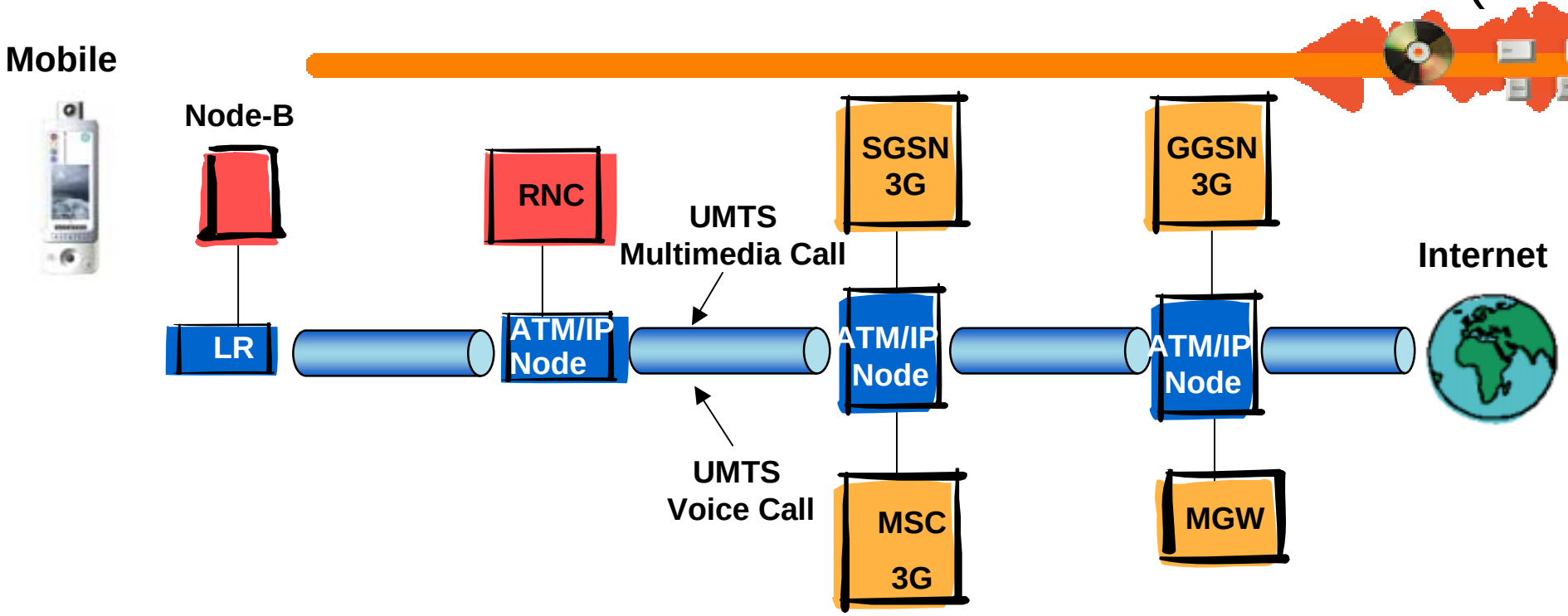
- High Capacity
- Added Value Services interfaces
- Combined GSM/GPRS/3G nodes

SOFTWARE UPGRADE
&
Introduction of Multimedia Environment

## New Generation All-IP Core

**For Innovative and Convergent Multimedia services**

# *Multistandard* approach
# Unified Data Infrastructure (*UDI*)




- **Benefit from a Unified Multimedia architecture by...**
  - Building an efficient Data infrastructure enabling both QoS & provisioning
  - Acting as a link between all components of any mobile solutions & any other access network
  - Sharing the cost and lowering CAPEX & OPEX

# A few conclusions

- Technology adoption is driven by market demand
- GSM/GPRS/EDGE + UMTS: technologies are complementary
- Sharing models, radio site engineering & evolutive solutions will provide the migration to 3G successful & cost-efficient

ALCATEL

ARCHITECTS OF AN INTERNET WORLD

# Thank you for your attention

## www.alcatel.com