Mobile Roaming Services in Latin America

Market & Technical Approach

IIRSA Workshop
Bogota, Colombia
7 November 2008

AGENDA

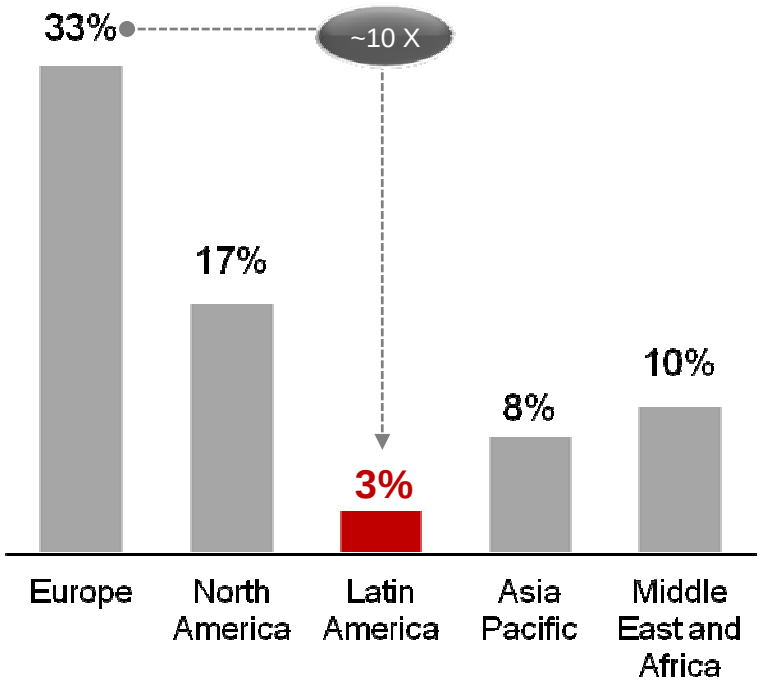
1. General Roaming Market Overview
2. Roaming Market Estimation & Scenarios
3. Initiatives for Roaming Services Improvements
4. Conclusions

1. General Roaming Market Overview

Latin American roaming market is developing, with less than 3% of subscribers using roaming services

Roaming Subscriber Penetration

(% of total mobile subscribers roaming at least once per year, 2007)



Latin American roaming market is developing

- Compared to other regions, roaming penetration is very small
- Income / capita is low so travel is less affordable than in other regions
- As such, 80-90% of roaming traffic is business-related
- Operator have an average of about 200 roaming agreements, and this number is growing rapidly
- As commerce and tourism develop, more roaming routes are becoming economically viable

Source: Informa Global Mobile Roaming Feb 2007, Convergencia Operator Survey, GSMA

Mobile networks across the region are at very different stages of development, with significant ongoing investment

Subscriber Numbers	New Services	Business Transformation
▪ To sell lines ▪ Focus on price reduction ▪ Strong subsidy of terminals ▪ To increase voice use	▪ What other services do my customers want? ▪ Segmentation ▪ New devices ▪ Increase SMS use ▪ Maintain ARPU ▪ Start to deploy 3G	▪ Pre to post paid migration ▪ New business models ▪ Mobile broadband, mobile TV, others ▪ 3G coverage expansion ▪ Retain-loyalty-revaluation of customers ▪ New device ecosystem
Peru **Brasil** **Bolivia** **Ecuador** **Paraguay**	**Brasil** **Columbia** **Venezuela**	**Argentina** **Chile** **Uruguay**

Mobile industry is facing technical challenges for the widespread adoption of roaming services in the region

Technology Challenges

1) Interoperability

i. Different network technologies: GSM/3GSM, CDMA/CDMA2000, iDEN do not allow for seamless roaming

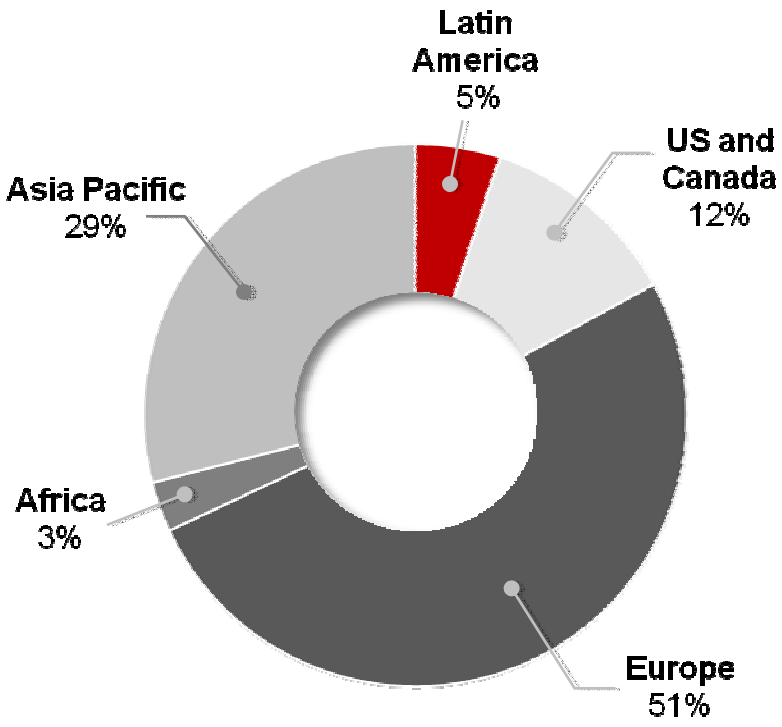
ii. Different GSM spectrum frequencies: Multiple frequencies in use thus most low-cost handsets cannot be used in different countries (same problem exists for 3G) – see graphic

2) Coverage

Network coverage (in particular 3G and GPRS) is still patchy as operators continue to build out their network

LDI is a very important element in the successful end-to-end service delivery, but outside control of mobile operators

Mobile-Originated International Traffic
(% of global mobile originated traffic)



Implications for Operators

- Most roaming calls are international calls (e.g. calls home)
- Very low volumes generated by LatAm operators, compared to other regions
- International gateway monopolies still exist in certain countries

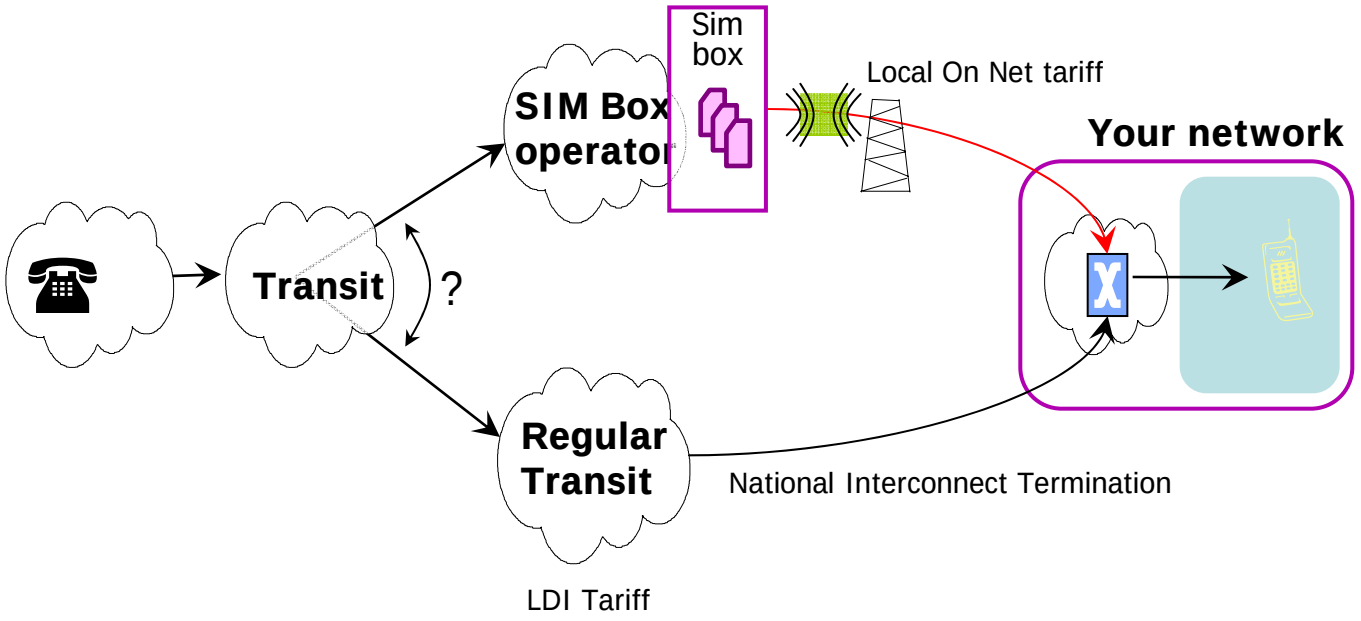
1. Low bargaining power on prices with international long distance operators
2. Quality of service issues exist and are difficult to resolve
3. Latin American operators are low on the priority list for some major ILD operators

Source: TeleGeography, Mobile Traffic 2008

Alternative use of ‘Illegal By Pass’ negatively affects quality of roaming services and local network performance

Negative effects of By Pass on mobile operators include:

- Network Congestion at point of interconnection, requiring countervailing measures and investment by operators
- Limited quality of service, including bad calling quality, dropped calls and absence of CLI
- No termination or interconnection revenues received
- Customer billing complaints due to faulty signaling



Implementing roaming agreements requires significant operational resources and investment

Commercial Challenges

(1) Complexity of rolling out new roaming agreements

- Due to commercial negotiations, testing and technical interoperability, roaming agreements take significant time to set-up

2) Resources for rollout of prepaid roaming

- Pre paid roaming requires implementation of dedicated platform and signalling and corresponding testing
- The CAMEL solution needs to be implemented one-by-one on a bilateral basis
- This requires significant operator resources and financial investment, which need to be balanced against expected revenues
- Hence only commercially viable on main traffic routes for larger calling volumes in both directions

3) Fraud

- Substantial investments are required to reduce fraud risks

4) Currency fluctuations

- Risk of currency fluctuation is born by operators, who are required to price in local currency

5) Pricing / promotions

- Billing platform constraints limit the extent to which local promotions can be used across networks

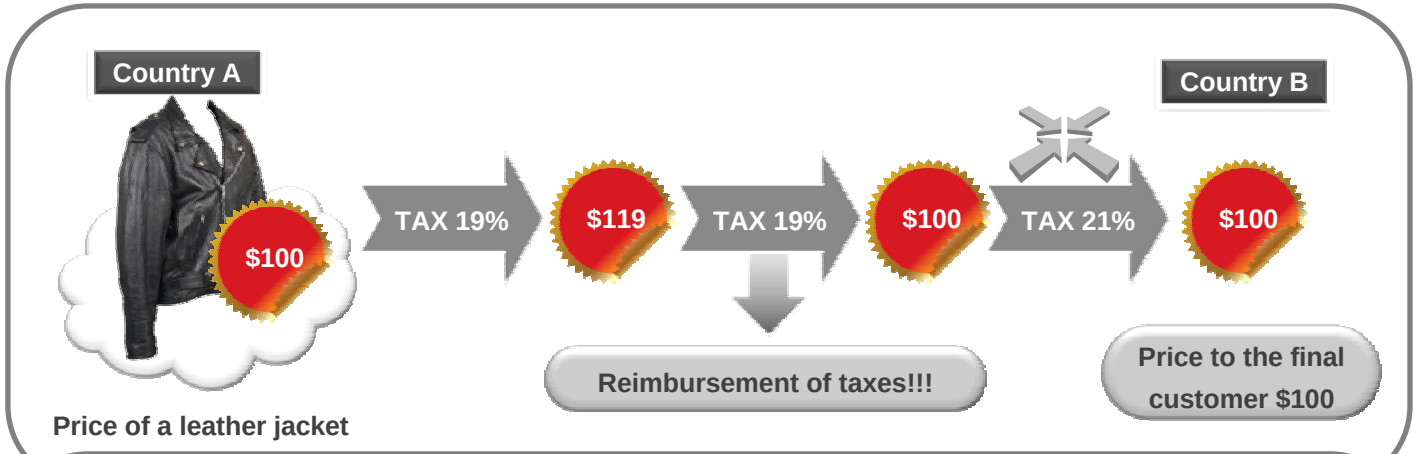
The current global economic crisis is increasing pressures on operator resources and financials

- **Current economic crisis is leading to:**
  - Overall moderation in the expected growth for LATAM Economies
  - Currency devaluation (Argentina, Brazil and Chile -12%, 30% and 40%) and exchange rate fluctuations, negatively affecting intra-regional investments flows
  - Consumers, companies and governments applying preventive restrictions on spend
  - Reduced inter and intra-regional tourism and business flows
- **This has a direct impact on roaming traffic, requiring industry to adjust its forecasts downwards:**
  - Estimations post October 2008 suggest that long haul trips could be cut by 40% for families' holidays and by 15% for business travelers
  - Until August 2008 (before current financial crisis) most operators agreed that Roaming Markets in Latam would grow around 15-20% in the next 3 years.
  - Now roaming traffic growth projections are being corrected to under 10%
- **And has knock-on implications for IT and Telecommunications investment:**
  - Limited access to capital is dampening investment, with companies having already announced investment reductions.
  - Lower demand or available spend for mobile and roaming services, in particular as roamers come mostly from the corporate segment.

Rollout of roaming services and infrastructure needs to be carefully balanced against investment decisions for other new services and technologies that are to the benefit of the entire customer base

Taxation rules are divergent across Latin America and result in a substantial burden on roaming prices

Whilst taxation of items like leather jackets may be reimbursed ...



...double taxation applies across the Latin America region

In Brazil, Argentina and Ecuador the taxation burden is even greater, with additional taxes such as withholding and local taxes

THE IMPORTANCE OF TAXES - DOUBLE TAXATION

Example of high taxes:
International Taxation

Double

International Roaming Service provided by country B

Customer pays
Y = (US$1,19) x (1*) x (1,897)
= US$ 2,257

* The margin is generally between 10-18%. To show the tax effect, it is assumed zero.

Customer pays Y:
Y = X + Margin A*
+ Withholding tax
+ VAT (A)
+ Local Taxes (A)

Country A: Brazil
(Home)

- Corporate Tax (over margin A)
- Withholding Tax (over $ sent to B)

Consider (Tariff)=US$1

A pays remuneration
= US$ 1,19

B charges X :
X = (Tariff) + VAT (B)
+ Local Taxes (B)

X= (US$ 1) x [1,19]
= US$ 1,19

Country B: Chile
(Visited)

- Corporate Tax (over income received from A)

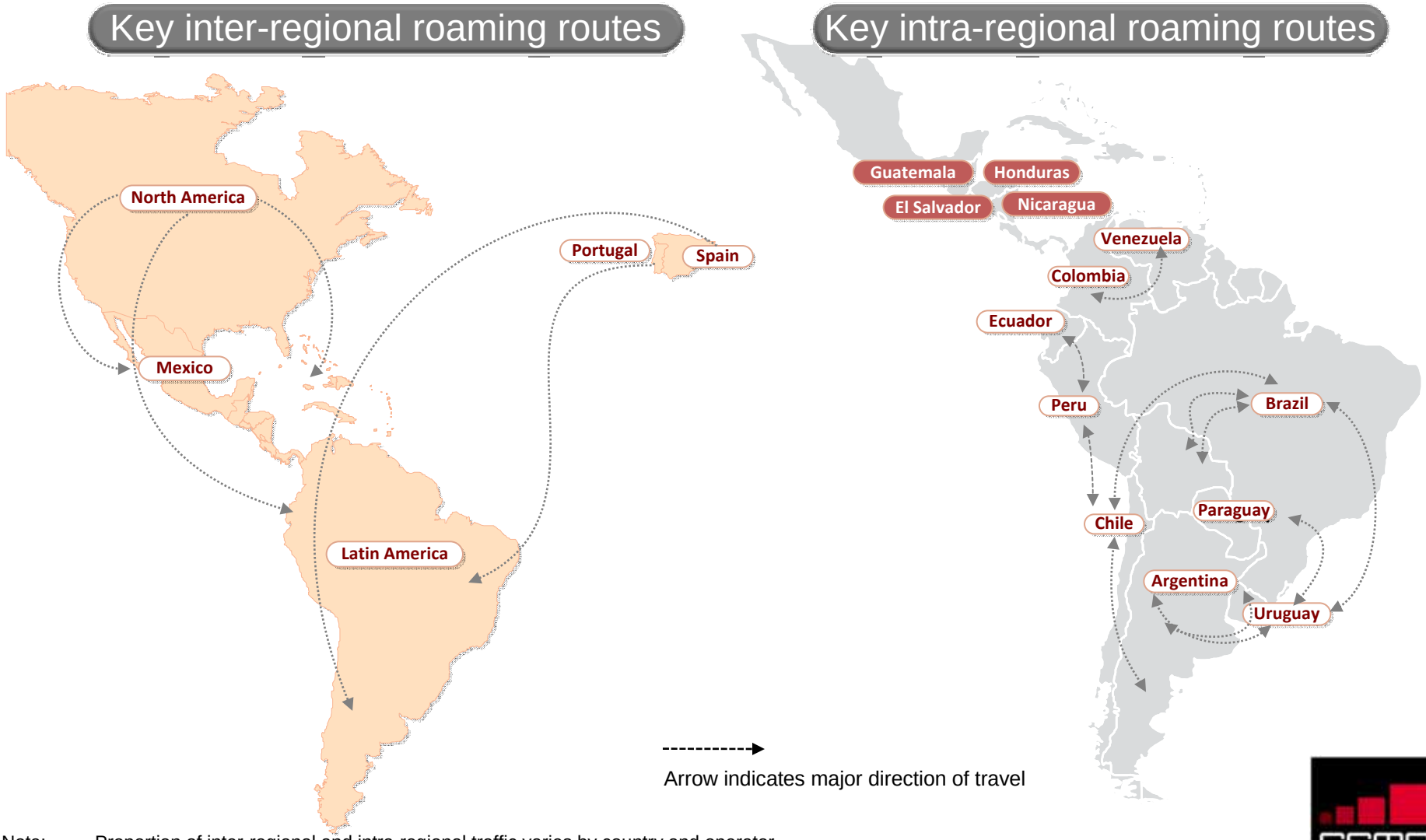
A CUSTOMER IN BRAZIL PAYS WITHHOLDING TAX AND VAT + LOCAL TAXES OF COUNTRIES A AND B.

THE TARIFF BECAMES 2,257 TIMES MORE EXPENSIVE BECAUSE OF TAXES.

Source: GSMA LA

2. Roaming Market Estimation & Scenarios

Roaming traffic flows mainly across number of key routes, although exact traffic patterns vary from operator to operator



Note: Proportion of inter-regional and intra-regional traffic varies by country and operator

Source: Operator Survey 2008, A.T. Kearney estimates and analysis

Scenarios & Assumptions of IDB Study

Based on assumptions made by IDB Study, increasing ARPUs can be estimated in the timeline:

Million of roamers	2008	2009	2010	2011	2012
Post paid	2,6	3,3	3,9	4,5	5,2
Pre paid	0,3	0,7	1,0	1,5	2,2
Total	**2,9**	**4,0**	**4,9**	**6,0**	**7,4**

Given by the Study

ARPU US$	2008	2009	2010	2011	2012
Post paid	170	170	176	183	190
Pre paid	13	10	11	10	10
Average	**153**	**142**	**142**	**140**	**136**

Revenues in US$ million	2008	2009	2010	2011	2012
Post paid	441	562	686	825	989
Pre paid	4	7	11	15	21
Total	**445**	**569**	**697**	**840**	**1.010**

Given by the Study

Scenarios by Convergencia Research

Pessimistic (Convergencia Research Estimation):
Roamers -> 4% annual growth ; ARPU -> 2% annual decrease 2009 - 2012

Million of roamers	2008	2009	2010	2011	2012
Corporate (post paid)	2,3	2,4	2,5	2,6	2,7
Holidays (post paid)	0,3	0,3	0,3	0,3	0,4
Holidays (pre paid)	0,3	0,3	0,3	0,3	0,4
Total	**2,9**	**3,0**	**3,1**	**3,3**	**3,4**

ARPU US$	2008	2009	2010	2011	2012
Corporate (post paid)	104	102	99	98	96
Holidays (post paid)	41	40	40	39	38
Holidays (pre paid)	12	12	11	11	11
Average	**88**	**86**	**84**	**83**	**81**

Revenues in US$ million	2008	2009	2010	2011	2012
Corporate (post paid)	238	243	248	252	257
Holidays (post paid)	12	13	13	13	13
Holidays (pre paid)	4	4	4	4	4
Total	**254**	**259**	**264**	**269**	**274**

Optimistic : Roamers -> 12% annual growth ; ARPU -> Remain with no change for 2009 - 2012

Million of roamers	2008	2009	2010	2011	2012
Corporate (post paid)	2,3	2,6	2,9	3,2	3,6
Holidays (post paid)	0,3	0,3	0,4	0,4	0,5
Holidays (pre paid)	0,3	0,3	0,4	0,4	0,5
Total	**2,9**	**3,2**	**3,6**	**4,1**	**4,6**

ARPU US$	2008	2009	2010	2011	2012
Corporate (post paid)	104	104	104	104	104
Holidays (post paid)	41	41	41	41	41
Holidays (pre paid)	12	12	12	12	12
Average	**88**	**88**	**88**	**88**	**88**

Revenues in US$ million	2008	2009	2010	2011	2012
Corporate (post paid)	238	267	299	335	375
Holidays (post paid)	12	14	16	17	19
Holidays (pre paid)	4	4	4	5	6
Total	**254**	**285**	**319**	**357**	**400**

Given by IDB Study

Million of roamers	2008	2009	2010	2011	2012
Corporate (post paid)	2,3	2,5	2,7	2,9	3,1
Holidays (post paid)	0,3	0,3	0,3	0,4	0,4
Holidays (pre paid)	0,3	0,3	0,3	0,4	0,4
Total	**2,9**	**3,1**	**3,4**	**3,7**	**3,9**

Most possible scenario (Convergencia Research) :
Roamers -> 8% annual growth ; ARPU -> Remain constant for 2009 - 2012

ARPU US$	2008	2009	2010	2011	2012
Corporate (post paid)	104	104	104	104	104
Holidays (post paid)	41	41	41	41	41
Holidays (pre paid)	12	12	12	12	12
Average	**88**	**88**	**88**	**88**	**88**

Revenues in US$ million	2008	2009	2010	2011	2012
Corporate (post paid)	238	257	278	300	324
Holidays (post paid)	12	13	14	16	17
Holidays (pre paid)	4	4	4	4	5
Total	**254**	**275**	**297**	**320**	**346**

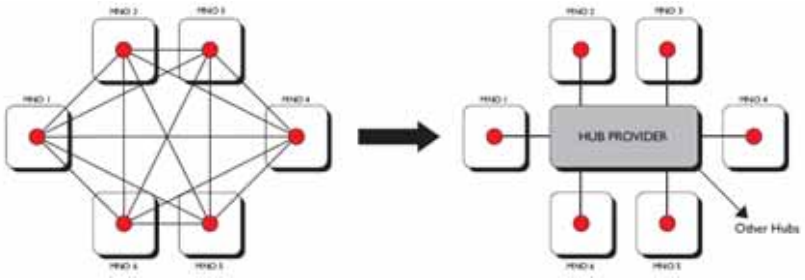
- **ARPU´s much lower**
- **Market Size smaller**

Taxes 50%

3. Initiatives for Roaming Services Improvements

The industry is investing in a number of initiatives which will further improve roaming service availability and quality

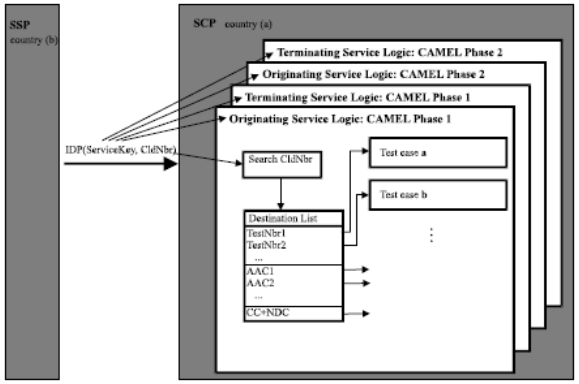
Global Roaming Initiatives



Hubbing Initiatives

- GSMA is undertaking a continuous global program of initiatives to improve roaming services
  - Near Real Time Roaming Data exchange
  - Various Roaming Hubbing initiatives for voice and data services
  - Global Roaming Quality
  - Infrastructure Development

Regional Roaming Initiatives



- Various regional initiatives by the mobile industry are further enhancing roaming quality and availability
  - Cross-border frequency planning to prevent “inadvertent roaming”
  - Ongoing initiative to promote interconnectivity and interoperability (e.g. data services, CAMEL)

Global Roaming Quality (GRQ) Project

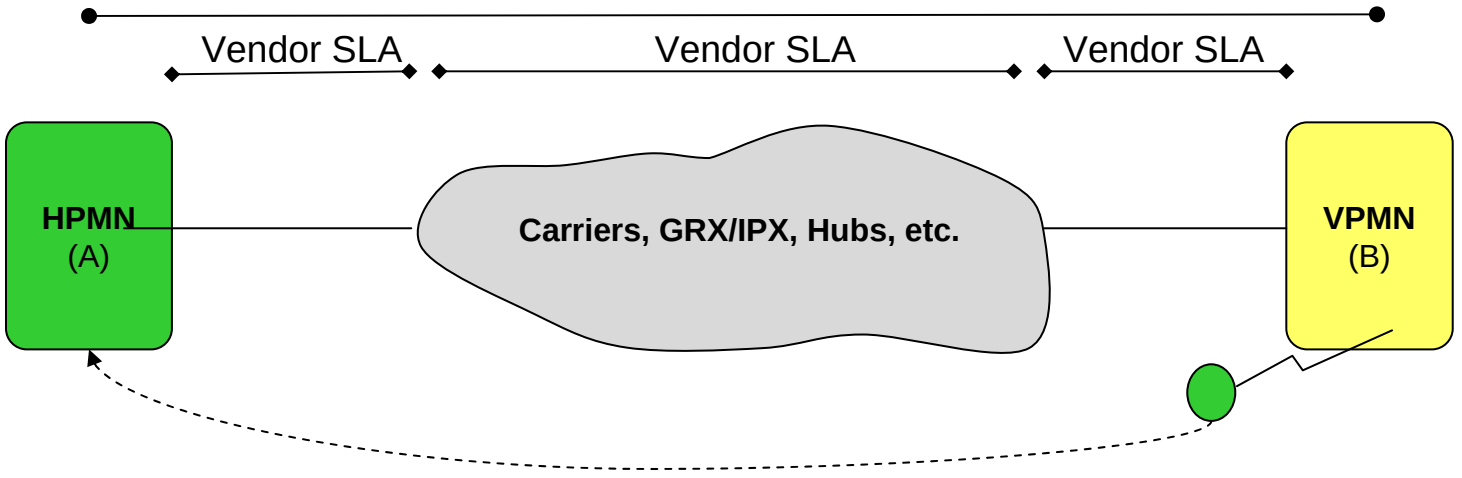
- Roaming quality affects all operators
  - Implementation of least cost routing – quality compromised to reduce costs
  - Poor roaming experience discourages usage and leads to dissatisfaction with home operator
  - Complex roaming delivery chain, many parties involved end-to-end
  - Existing monitoring is fragmented e.g. not end-to-end

- Aim of GRQ:
  - Deliver a neutral framework for pro-active and reactive monitoring, measuring, and assuring of end-to-end roaming services quality

Quality of Service (QoS)
"the collective effect of service performance which determine the degree of satisfaction of a user of the service", ITU-TE.800

Roaming Quality is as good as the weakest link

- Service Level Agreements formalise QoS in roaming agreements
- GRQ enables end-to-end service level agreements for roaming QoS, using common KPI, standard monitoring procedures, roaming trouble shooting, and procedures for use of test SIM cards



Project Progress & Next Steps

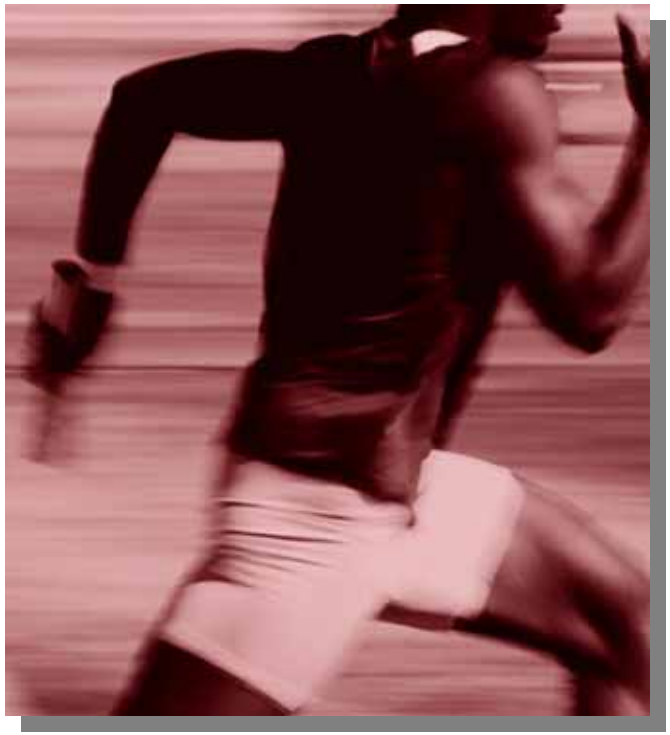
- Trial of GRQ Framework completed
  - Trial conducted with 10 operators and 7 vendors covering Europe, Asia, Africa, Middle East, North America
  - Trial also tested commercial setup and troubleshooting

- Next: GRQ Go-to-Market
  - Help operators to implement the new framework and encourage increase of operator participation
  - Working with regional GSMA groups, including Latin America
  - Go-to-market campaign
  - Facilitate the creation of a critical mass e.g. establish champion operators in each world region
  - First regional campaign group already established; LatAm campaign group being established

Roaming fraud is a continuous and significant financial risk to the mobile industry across the globe

- Industry has suffered significant losses relating to roaming fraud over past years
  - Fraud incidents reported worldwide
- Current roaming fraud prevention procedure (High Usage Reporting) between operators is inadequate to address threat
  - HUR process developed in early days of GSM
  - No visibility of roaming customer activity provided to home network for up to 36 hours
  - Window of opportunity for roaming fraud is too long
  - Need new long-term strategy

Near Real-Time Roaming Data Exchange (NRTRDE)



- Automatic transfer of roaming records from visited network to home network, usually within one hour
- Proven effectiveness – proprietary solutions already used in Americas for several years
- Most valuable when deployed by many operators

NRTRDE Project Objectives

Eliminate industry exposure to roaming fraud by:

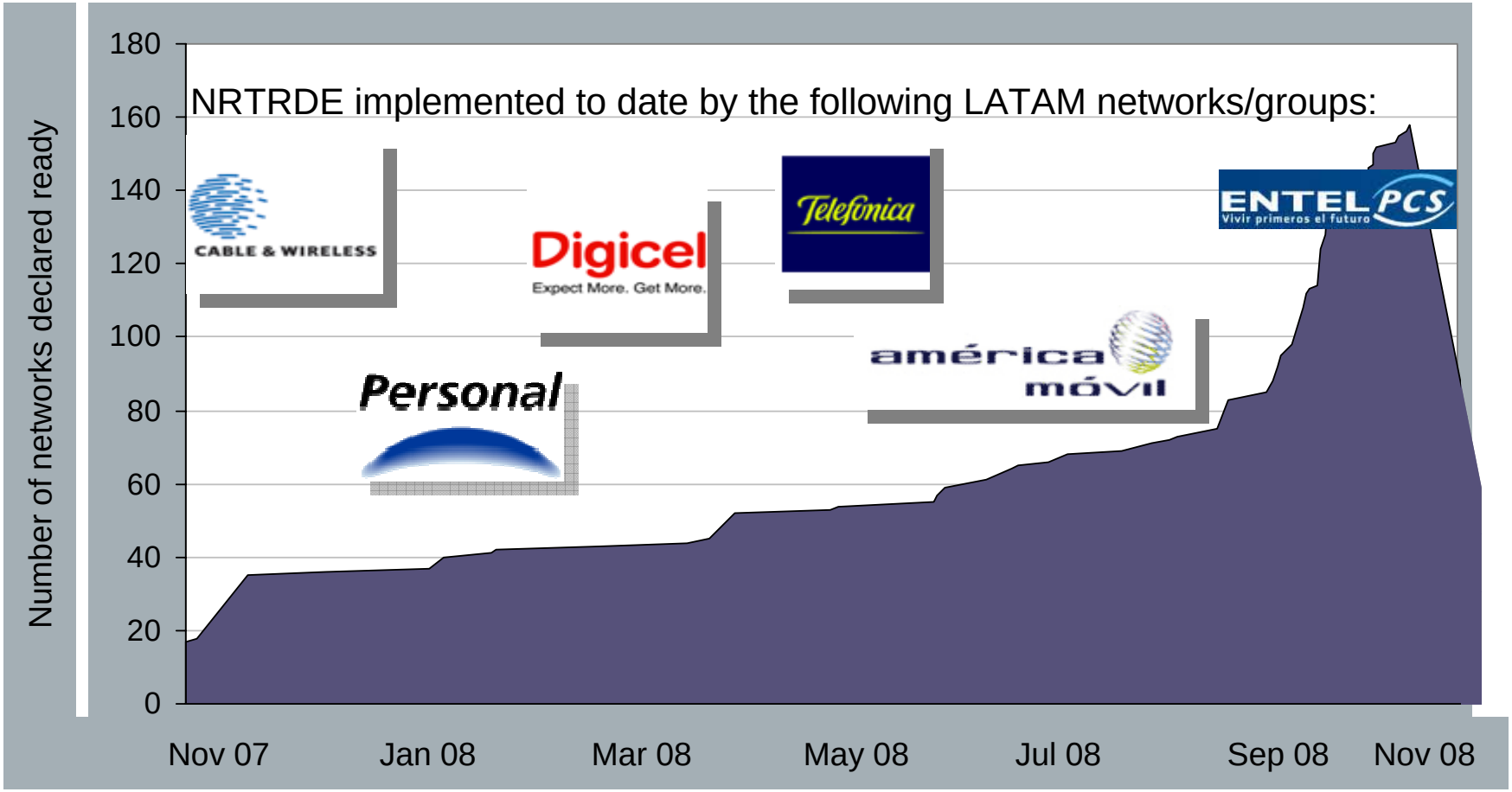
- Facilitating NRTRDE implementation by GSMA members
  - Develop a cost-effective and globally interoperable NRTRDE solution
  - Facilitate new market entrants to drive competition
  - Develop implementation and changeover (from HUR) guidelines
  - Change roaming agreement liability provisions to support NRTRDE

COMPLETED

- Promoting NRTRDE implementation to replace HURs
  - Aim is entire GSM industry adoption
  - However this will ultimately be driven by roaming market forces
    - Operators will request roaming partners to implement NRTRDE to protect both parties

ONGOING

Global NRTRDE Implementation Status (Oct 30: 160 networks)



4. Conclusions

South American roaming market should be allowed to continue to develop unhindered

Key takeaways

The market is young and emerging

- Roaming is a developing market, mainly used by business customers
- Only 3% of the population travel abroad
- Under current economic crisis, volume of travel is likely to decline

South America is different to other roaming markets

- Low GDP/ capita and limited regional economic integration constrain roaming traffic
- Highly diverse region in terms of economic conditions and mobile market development
- Lack of cohesive regulatory and legal framework

The market faces some challenges…

- Taxation and ILD are major cost components of roaming services
- Pre-paid roaming requires high investment and resources
- Many players are involved in the end-to-end service delivery chain

…but industry is taking the lead

- Industry continuously investing in a range of projects to rollout and improve roaming services and infrastructure
- Pricing innovation and transparency initiatives are propelling the market forward

Regulators, governments and mobile industry can work together to further improve and advance roaming services

Ideas for joint initiatives

- **Reduce taxation burden, e.g. by eliminating VAT**
- **Ensure sufficient and harmonised spectrum allocations to provide capacity for growth and launch of new services, and support roaming interoperability**
- **Criminalise cases of fraud (roaming fraud, handset theft)**
- **Legal ability for operators to withhold payment and cut-off service in case of suspected fraud**
- **Address illegal bypass concerns**
- **Ensure successful Long Distance Interconnect at appropriate QoS**
- **Other?**

Thank You