

Interstandard Roaming

Keep it Simple

by

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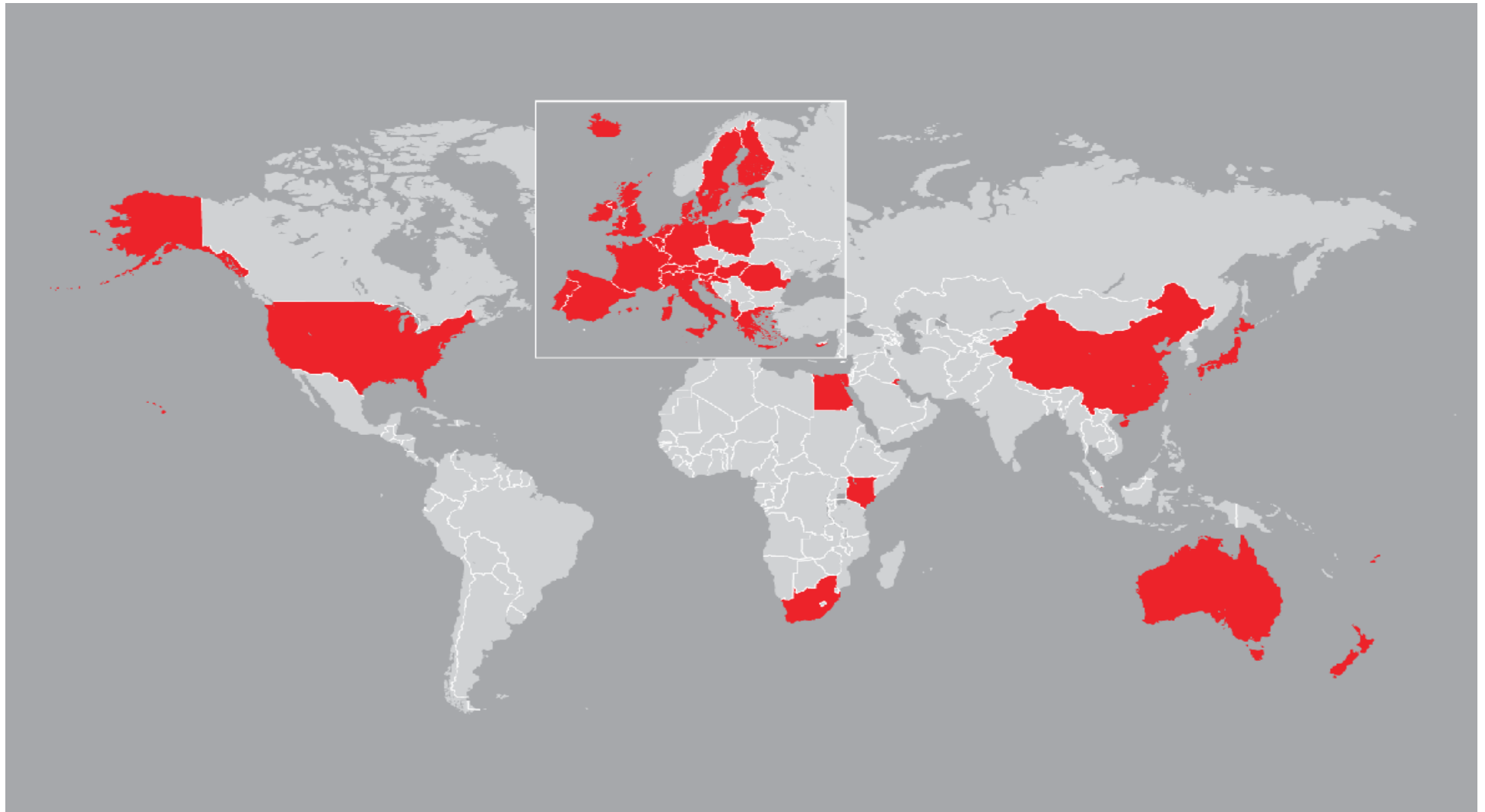
2005 CDMA Latin America Regional Conference

Rio de Janeiro, 18-20 April 2005

Vodafone Worldwide

- World's leading mobile telecommunications company
- Independent company since 1991
- First international roaming call in 1991 with Telecom Finland
- Present in 39 countries across 5 continents (incl. 13 Partner Networks)
- Currently 146,7 million registered customers (calculated proportionately on ownership)
- Turnover £ 33,6 Bn, Operating Profit £ 10,7 Bn (year 2004/5)
- GSM & CDMA (Verizon Wireless) technology
- Launched 3G technology Europe-wide including roaming in 20 countries
- CDMA-EVDO launched by Verizon Wireless in more than 35 US markets now

Vodafone Footprint



The main questions

What is Interstandard Roaming?

- Roaming between two standards, GSM and CDMA

Why Interstandard Roaming?

- Fill in the gaps where no CDMA networks are available (mainly Europe, Africa, Middle East and parts of Asia) with only one roaming contract

What added value does Interstandard Roaming offer?

- Extra revenues, competitive edge and customer delight

What is needed to enter a roaming agreement?

- See further this presentation →→→

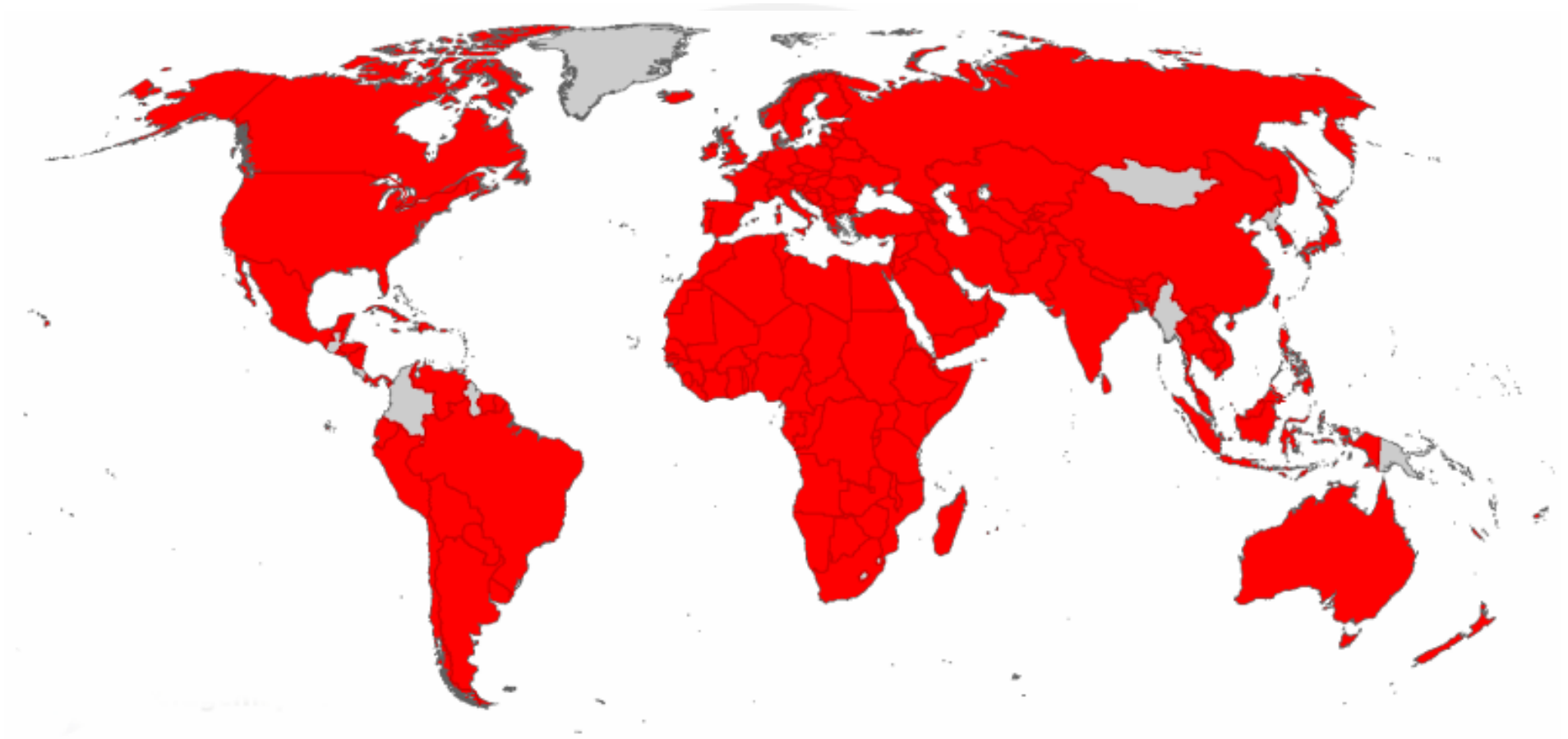
Key characteristics of the dominant technologies in the wireless world

	GSM	CDMA
Coverage	Worldwide, 210 countries	Americas, Asia and Eastern Europe
Market size	1266 million subscribers (market share 75%)	237 million subscribers (market share 14%)
Characteristics	Designed for roaming	Designed for high speed data
Data speed		
- <i>current</i>	GPRS 20-30 kb/s	CDMA1x 60-100 kb/s
- <i>rolling out</i>	3G (UMTS) 150-300 kb/s	3G (EV-DO) 500-1500 kb/s
Billing standard	TAP	CIBER
Network protocol	MAP	ANSI-41
Handsets/datacards	GSM 850/900/1800/1900 MHz UMTS 2100 MHz	450/800/800R/1700/1900 MHz
Authentication	SIM card	R-UIM/UIM

Customer requirements

- Extension of current roaming territory (mainly Europe, Africa, Middle East and parts of Asia)
- Transparent roaming
 - Keep own number
 - Voice mail as usual
 - Access to SMS
- Simple procedures
 - Activation of the service
 - Handset logistics (type of handset, buy or rent)
 - SIM / R-UIM instructions
 - Easy access to Customer Services
- Extension to data roaming where ever possible

World GSM Coverage – Vodafone NL



Worldphones (only on request)



Samsung SCH-A790/W109
CDMA1x/GSM
(China Unicom / Verizon / Sprint)



Motorola A860
CDMA1x/GSM/GPRS
(China Unicom)



LG W800
CDMA1x/GSM/GPRS
(China Unicom)



AMOI CMA8301
CDMA2000/GSM/GPRS
(coming soon)

Twin phone concept (examples)



**NOKIA
6220**
GSM

**NOKIA
6225**
CDMA



**NOKIA
3200**
GSM

**NOKIA
3205**
CDMA



V60i

Twin phones:

- Same handset, same menu, same battery, same charger, same accessories
- SIM swap needed (preferably R-UIM)
- Share Phonebook in case R-UIM is used

Three steps to take extending roaming to GSM

1. Sign roaming agreement with GSM sponsor acting as virtual CDMA operator:

- CDMA International Roaming Agreement – CDG Document 44
- TDS Technical Data Sheet
- SIM/R-UIM delivery agreement

2. Contact your Clearing House for signalling and billing conversion

- Delivery of billing files in CIBER format
- Web based provisioning of GSM roaming services
- **Select best fitting handset solution**
 - Dual mode handset (Samsung, Motorola, LG, AMOI)
 - Twin phone concept

SIM or R-UIM?

For user authentication in GSM either SIM or R-UIM is needed

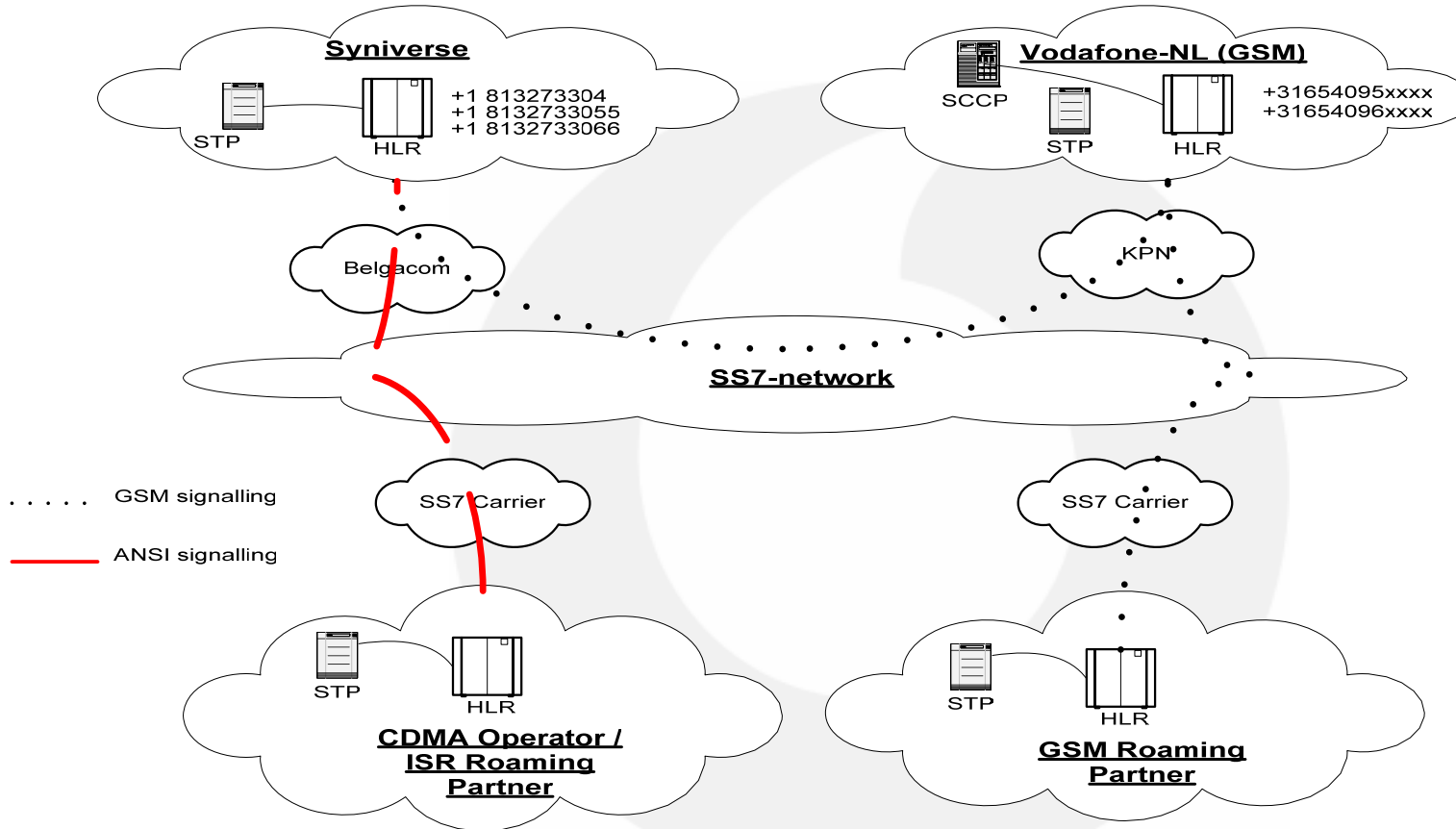
SIM (Subscriber Identity Module)

- All subscriber data including own number stored on one chip for authentication on GSM networks
- SIM can be used along with any GSM phone or dual mode GSM/CDMA Worldphone

R-UIM (Removable User Identity Module)

- All subscriber data including own number stored on one chip for authentication on GSM networks **and** CDMA networks
- R-UIM can be used in either stand-alone GSM or (R-UIM capable) CDMA phone
- R-UIM can be used in a (R-UIM capable) dual mode GSM/CDMA Worldphone

Required signaling for ISR Roaming



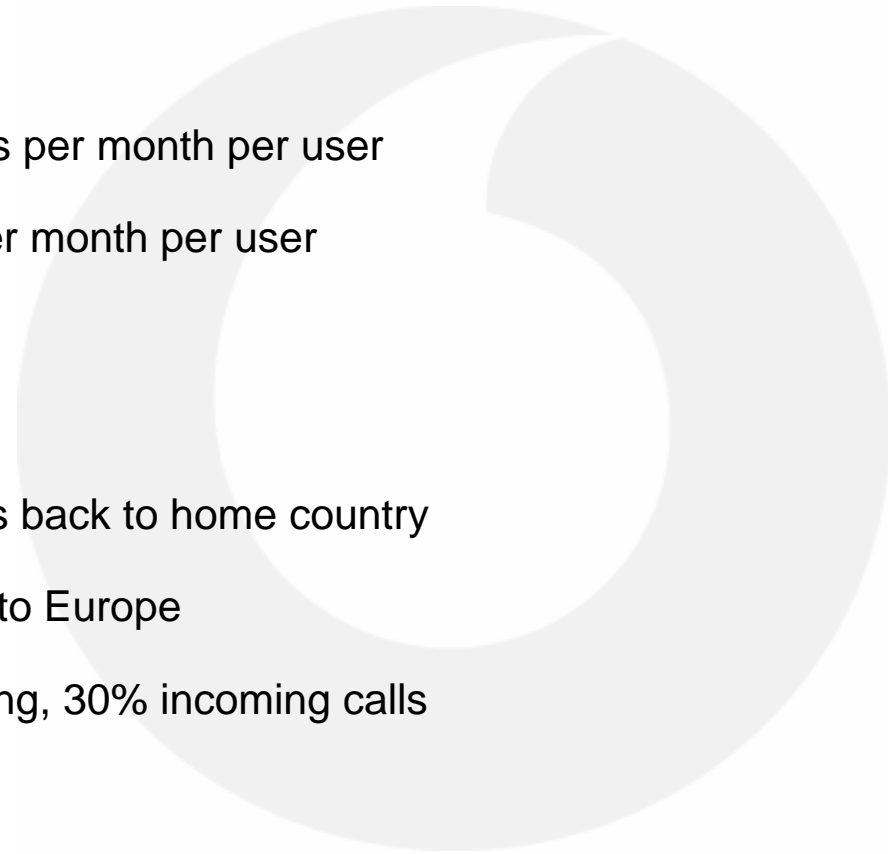
CDMA operators need ANSI signaling connectivity with Syniverse

Any SS7 signaling carrier can be used.

Typical usage characteristics

- ❑ Average usage
 - 150 minutes per month per user
 - US\$ 200 per month per user

- ❑ Call distribution
 - 85% of calls back to home country
 - 10% within/to Europe
 - 70% outgoing, 30% incoming calls



Cost for the CDMA-operator

- Signalling and provisioning cost charged by Clearing House
- Cost of airtime and long distance calls plus premium for all-GSM-in-one-contract charged by virtual CDMA operator (roaming broker)
- License fee for GSM profile on R-UIM card **or** cost per SIM card
- Possible handset subsidy depending on chosen concept

Conclusions

- Proven concept (a.o. Sprint, Verizon Wireless, Movilnet, Iusacell and Verizon PR)
- Simple to implement:
 - Technical: access to GSM world behaves like CDMA operator
 - Commercial: standard CDMA International Roaming Agreement can be used
- Revenue generator
- Better position in competing with your local GSM networks

Thank you for your attention

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CDMA/TDMA to GSM Roaming

Delivered by **Vodafone**, The Netherlands