CDMA LATIN AMERICA OPERATORS
ROAMING MEETING

Rio de Janeiro
April 18, 2005
9:00 – 12:00
Agenda

CDG IRT and Roaming Projects
CDG Roaming Agreement updates
PRL Enhancement
Plus Code Dialing
Packet Data Roaming
MIN based IMSI and true IMSI Implementation
MEID
IRT Journal
Roaming Bulletin Board
CORIE
Standard TDS for Voice and Packet Data
Roaming contact List review
CDG IRT and Roaming Projects

CDMA Roaming Statistics
• Worldwide CDMA Roaming Implementations
• Top 20 Operators
• Operator Field Results – Call Success Rate

CDG Roaming Project
• Key Elements of the Project
• Project Phases
• Project Organization

CDG International Roaming Team (IRT) Update
• CDG Roaming Reference Documents
• IRT Meetings – 2005

For questions about the CDG roaming project contact Bill Dahnke at bdahnke@cdg.org
International Roaming Team (IRT) subgroup is working on a standardized contract for use between CDMA carriers

Document #44 is posted on the CDG website and a copy is on your CD

- 2c Document 44 - International Roaming Agreement Templates

Definitions of terms associated with roaming services

- Agreement on wholesale rates/tariffs
- Exchange of information (e.g. IRM information)
- Individuals responsible for administering the agreement
- Billing procedures & responsibilities
- Settlement procedures
- Customer care requests
- Fraud tools and processes
- Limitation of liability
- Agreement suspension & termination
- Dispute settlement process

For questions or comments - please contact Sara Aab at saab@qualcomm.com
PRL Enhancement

Provides a more efficient means to describe a network in a PRL

- Knowledge of the use of SIDs and NIDs within a visited network becomes optional
- National wireless carriers’ networks may cover a large number of SIDs (tens or hundreds)

Requires no changes to existing standards

- Existing messages/fields populated with appropriate data

Does not require that full IMSI support be available in the core network (ANSI-41) for its implementation

Allows for reduction in size of PRLs

Allows international roaming partners to describe a greater number of roaming networks in the same PRL size

- More efficient use of memory in the handset of R-UIM
- Reduced PRL download times (OTA)
- Easier to ensure foreign partners’ information is current

Most valuable if all or most CDMA carriers implement this
## PRL Enhancement – Carrier Status

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<th>Operator Name</th>
<th>Last Report Date</th>
<th>Network Capable</th>
<th>MCC MNC</th>
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Plus Code Dialing

What is it?

- Plus code dialing allows a subscriber to easily place an international call without having to memorize each International Access Code (IAC) per visited country
- The subscriber simply pushes a key on their handset and the IAC is dialed for them

Why do it?

- Ease of use - Many subscribers do not know what an international access code is
- Practicality - It is not convenient for subscribers to carry a piece of paper that lists the international access codes
- Simplicity - Customers require simplicity in roaming service, particularly when utilizing roaming service outside their home country when things can get quite complex
- Revenue - Carriers cannot generate roaming revenue if customers cannot figure out how to place international calls

What does it mean to you?

- Ensure your network, billing systems and terminals can recognize plus code dialing

For more information see the +code dialing presentation on your CD and browse the CDG website past IRT presentations
Packet Data Roaming

Challenges

- There are no *standards* for implementing CDMA data roaming, connectivity and protocols are left open for the operators to define.
- Data roaming implementation decisions are relevant to both 1xRTT and EV-DO.
- The CDG provides *recommendations* for implementations:
  - Reference Document #79: Wireless Data Roaming Requirements and Implementation
  - Reference Document #94: CDMA Packet Data Roaming eXchange Guidelines

Document #79 – Implementation Guide for Packet Data Roaming

- Network implementation models reduced to three (Simple IP, Mobile IP, L2TP)
- Updated terminology and expand scope, e.g. beyond WAP
- Updated to cover EV-DO roaming issues, e.g. A12
- Billing portion moved to a new, separate document (provided)

CDMA Data Roaming Exchange - Interconnection made easy

- CRX provider is a 3rd-party hub to exchange roaming traffic: (User traffic, Signaling traffic, AAA traffic and Billing records)
- CDG Document #94 provides guidelines for CRX
- IRT Task Force currently working through the implementation of CRX peering
MIN based IMSI and true IMSI Implementation

The MIN is a 10-digit (34-bit) number for subscriber identity

The IRM is a special type of MIN - guaranteed to be globally unique

The IMSI is a 15 digit subscriber identity comprising

- Mobile Country Code (MCC is the first 3 digits of the IMSI)
- National Mobile Station Identity (NMSI) is formed by the remaining digits. The NMSI comprises Mobile Network Code (MNC) and Mobile Station Identification Number (MSIN).

MIN Based IMSI (IMSI_M) & True IMSI

- MIN Based IMSI has MIN/IRM in the right-most digits. MCC and MNC (IMSI_11_12) may not be a unique combination across operators
- True IMSI (IMSI_T) An IMSI that is not associated with the MIN. MCC and MNC (IMSI_11_12) are a unique combination – globally unique identity

IS-751 and ANSI-41 E provides IMSI support in the MAP network

Implementation issues in concurrent MIN based and True IMSI support

- Routing non-unique IMSI_M.
- When to use the last 10 digits only
MEID – Mobile Equipment IDentifier

• 56 bit number (ESN=32 bits), defined in CDMA2000 rev D
• Like ESNs Managed by TIA.

ESNs projected to exhaust in early 2007 – before Rev-D

Doing nothing requires use Pseudo-ESNs

• Collisions impact Fraud & Billing systems, Emergency number callback, crosstalk

Information

• CDG conducted an MEID Workshop in San Diego, February 7
• Material available on CDG website. Contact Sam Samra (ssamra@cdg.org)

Ad-hoc CDG MEID team to address requirements document Led by Kent McKullough of Verizon Wireless (kent.mccullough@verizonwireless.com)

CIBER Record already updated, no clearinghouse issues
This is a journal about international roaming activities for the CDMA roaming community

Produced by the CDG with contributions from CDMA carriers and vendors

The first edition was published for the Beijing IRT in March of 2005

Next submission deadline is April 25, 2005

8a IRT Journal 105rev2.1.doc

8b IRT Journal Call for Contributions.pdf

Edited by Sara Aab at saab@qualcomm.com
Roaming Bulletin Board

Started in February 2005 due to requests by carriers

www.cdg.org resources/member room/roaming forum

Vendors and carriers can submit or answer any CDMA roaming question

Don’t have to log in to website to use the bulletin board

Public section of the website so don’t post proprietary information

Newly created feature

• Browse the board any time or get email notification of new postings
• For Notification send an email to roamingquestions@cdg.org and put “roaming bulletin board email notification request” in the subject line

This will only be successful if YOU participate

For questions about the bulletin board contact Libby Mackay at lmackay@qualcomm.com or email roamingquestions@cdg.org
Carriers are asking for a way to access roaming partner information in an easy and reliable way

Errors or missing information causes mistakes in PRLs and delays implementations

CDMA Operator Roaming Information Exchange

- A web link that will house participating CDMA carriers’ roaming information
- This site will contain the network and contact information normally exchanged between roaming partners when they set up voice roaming
- The information will be in separate files out so carriers can release only the sections they are ready to release to specific carriers
  - Example – can release SID, NID, MCC MNC, channel and frequency information but don’t have to release your line ranges and risk them being loaded too early

Currently evaluating existing tools

Most important and asked for change is a standard TDS without which it will be difficult to utilize existing and new roaming tools
Standard TDS for Voice and Packet Data

Voice Data

• All operators have their own variant format
• Analyzing and incorporating changes can be difficult
• Essential Data has to be derived from various parts (e.g. PRL)

Packet Data

• Significant data must be exchanged between operators to implement PD roaming.
• It would be beneficial to have a standardized format for packet data roaming information exchange.
• Data to Exchange
  – IP Addresses of infrastructure elements, Realms and the treatment realms should receive, Security policies: which ports are required to be open for application.
• IRT Reference Document (#81) draft describing a voice Technical Data Sheet

Standardizing formats for TDS information

• first step in reducing errors of mis-configuration
• Prepares the way for tools to assist in roaming implementation
  – PRL auditors and testers. TDS Exchange Services
Roaming contact List review

Contact list for other CDMA carriers is posted on the CDG website – www.org.org Members/Login/Technical Teams/International Roaming/International Roaming Contacts at Carriers

13a CDG Roaming registry Apr 15 updates.xls

The list was updated in mid April and will be posted on the website soon

A copy of the updated list is on your CDG International Roaming CD

Please take a moment to review the information for your company right now.

See something that needs to be updated?

• If it is not complete either provide Libby with the changes now or
• Email roamingquestions@cdg.org and we will update the master list
CDG Roaming Reference Documents

29 - System Selection for Preferred Roaming Stage 1 Description

44 - CDMA International Roaming Agreement

50 – Interface Specifications

52 - IS-41 Interworking Test Specification

59- Billing Specification,

62 - Removable User Identity Module (R-UIM) for TIA/EIA Spread Spectrum Standards Conformance Test

79 - Wireless Data Roaming Requirements and Implementation, Phase 1,

81 - CDMA International Roaming Technical Data Sheets

86 - PRL Enhancements for International Roaming

87 - CDMA International Roaming Troubleshooting Procedure and Trouble Report Form

94 - CDMA Packet Data Roaming eXchange Guidelines