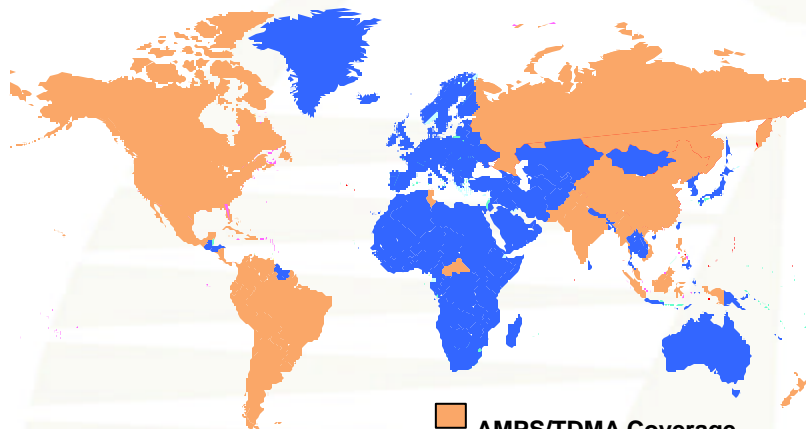# The Commercial Issues of Interstandard Roaming

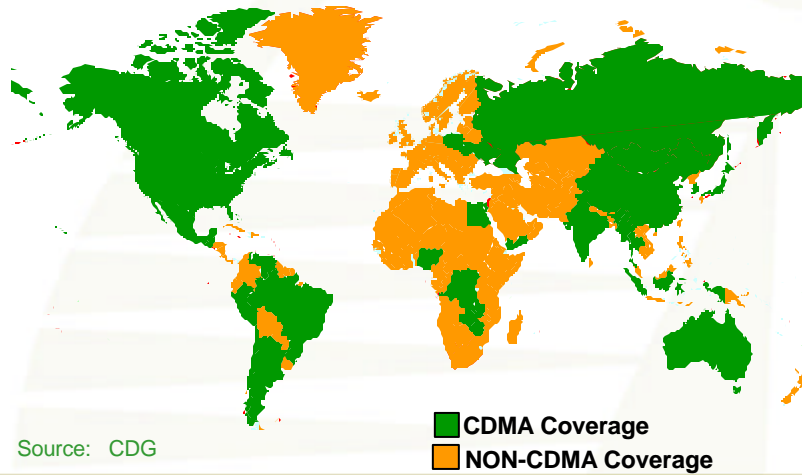Dave Grootwassink, Technical Director- Illuminet

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TDMA Subscribers (Oct.2000): 56.3 million
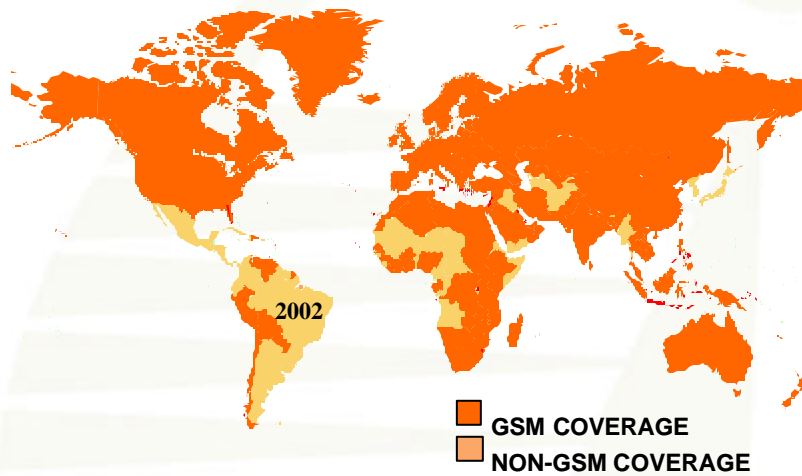**AMPS Subscribers (Oct.2000): 75.4 million**

Source: UWCC

- AMPS/TDMA Coverage
- NON-AMPS/TDMA Coverage

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Why Bother with Interstandard Roaming?

- ✍ Potential serving revenue from 654 million subscribers all over the world

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Why Bother with Interstandard Roaming?

- ✍ Potential serving revenue from 654 million subscribers all over the world

- ✍ World wide expansion of roaming coverage

- ✍ Keep your subscribers from looking for other options

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Commercial Issues

Roaming Agreements:

- ✍ How will you negotiate and implement roaming agreements with partners across the globe?
- ✍ How will interstandard roaming impact existing and future roaming agreements?
- ✍ What are the technical and business differences that will affect your roaming agreement?

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Commercial Issues

Clearing and Settlement:

    ✍ How will your company settle with your new roaming partners?

    ✍ What are the differences in billing systems and settlement systems standards?

    ✍ Are there any governmental restrictions on settlement between operators?

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Commercial Issues

Fraud Management:

    ✍ How will your company monitor fraud?

    ✍ What changes and procedures must be made in your fraud department?

    ✍ Is your company willing to make an investment to protect itself from interstandard roaming fraud?

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Commercial Issues

Minimum Services:

- What services do you offer your customers? What do they expect when roaming?
- Are those services available across technologies?
- What services does your company want to offer customers roaming into your markets?

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Commercial Issues

Troubleshooting

- How will your company address roaming problems across technologies?
- What will be needed in order to resolve roaming problems quickly?
- What kind of training will be necessary for your engineers?

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Commercial Issues

Signaling Issues

- How do I deal with the bearer protocol differences?

- How do I deal with the MAP differences?

- How do I deal with the basic handset identification and routing issues?
    - What's an IMSI?
    - What's a MIN or ESN?

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Roaming Agreements

- Existing roaming agreements do not address interstandard roaming related issues.
- New roaming agreements will need to be negotiated to define differences in technologies and business practices
- Choice of Law: Which country's law will govern the interstandard roaming agreement?
    - In the GSM environment, Swiss law governs the agreement between two operators.
    - For interstandard roaming, do operators want to follow that path? Are non-GSM operators familiar with Swiss law?

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Roaming Agreements

- The Commercial Issues Group of the GSM Global Roaming Forum (GGRF)
  - Good News: GGRF is focusing on creating an Interstandard Roaming Agreement that will protect both parties in an interstandard roaming relationship. This agreement, when completed, can be used as a template for interstandard roaming.
  - Bad News: There are many competing interests that are dragging out the process.

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Roaming Agreements

- Technology differences between operators should be defined in the agreement.
  - New acronyms that each side is used to using every day needs to be spelled out.
  - Procedures for technical data exchange need to be established
    - Tech data sheet v.s. IR21 document
    - MSCID/Point Code Routing v.s. Mobile Global Title
    - The agreement should also define how network testing will be performed between the two operators.

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Roaming Agreements

- ✍ Business Operations Differences:
  - ✍ Business differences between operators should be defined in the agreement
  - ✍ Customer Care Support Information
    - ✍ Who should be called when there is a network problem?
    - ✍ Who does a roaming customer call for assistance?
    - ✍ Customer Care working days and hours of operations can be different.
    - ✍ Multi-lingual technical support operations?

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Clearing and Settlement

- ✍ Call Record/File Format Exchange:
  - ✍ What file formats will be used by your roaming partners
    - ✍ CIBER 2.0
    - ✍ CIBER 2.5
    - ✍ TAP 2+
    - ✍ NA TAP 2
    - ✍ TAP 3
    - ✍ TAP 3.5
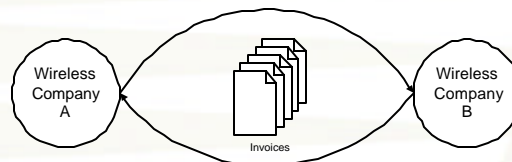 - ✍ How do I read/write all of these formats?

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Clearing and Settlement

- ✍ How does your roaming partner exchange call records?
  - ✍ Electronic transfer
    - ✍ FTP?
    - ✍ VPN?
    - ✍ PKI Internet Transmission?
  - ✍ Tapes or CD's
    - ✍ These can be used, but will add time to an operator's billing process.
    - ✍ Magnetic and optical media shipped internationally must traverse customs.
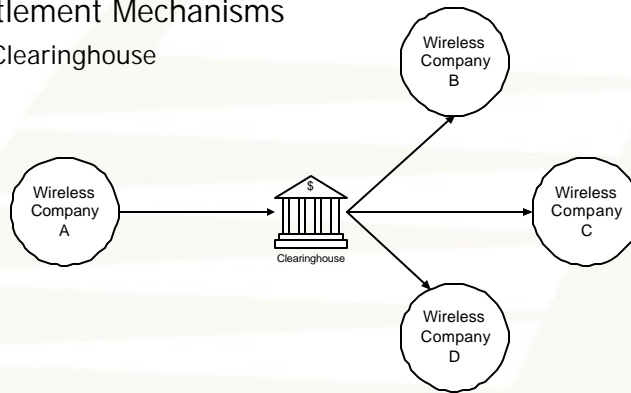
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Clearing and Settlement

- ✍ Settlement mechanisms
  - ✍ Direct invoicing

Wireless Company A — Invoices — Wireless Company B

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Clearing and Settlement

? Settlement Mechanisms
  ? Clearinghouse

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Fraud Management

? Authentication
  ? Works well – Authentication standards differ between IS-41 and GSM systems
  ? Not available everywhere. Particularly in Analog coverage areas.
? CDR Exchange
  ? GSM world – Standard agreement requires fully rated CDRs be sent to home carrier within 36 hours.
  ? IS-41/CIBER world – 30 Days
    ? Alternatives exist in the IS-41 world for < 30 minute exchange of unrated records

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Fraud Management

- ✍ High Usage Reports
  - ✍ High usage reports are used extensively in the GSM community.
  - ✍ Shown to be effective in fighting some forms of fraud.
  - ✍ Can be cumbersome to produce and use
    - ✍ Are you prepared to offer high usage reports to your GSM partners?
    - ✍ Is your fraud department prepared to interpret and deal with high usage reports coming from GSM carrier fraud departments?

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Fraud Management

- ✍ PIN Validation System
  - ✍ Does not completely eliminate incidence of cloning, but can limit the damage
  - ✍ Available in IS-41 world, but rare in GSM
  - ✍ Can be cumbersome for subscribers
- ✍ Other fraud mitigation factors
  - ✍ Should you limit your roaming to "Assume Negative" markets?
  - ✍ How should you respond to a signaling loss to an "Assume Positive" market
  - ✍ Who has monitoring responsibility?

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Service to Roamers

- ✍ Roaming into GSM markets
    - ✍ Voice
    - ✍ Call Forwarding
    - ✍ Call Waiting
    - ✍ Caller ID
    - ✍ Call Hold
    - ✍ Voice Mail
    - ✍ Message Waiting Indicator
    - ✍ 3-Way Calling
    - ✍ "+" International Direct Dialing (International Access Code)
    - ✍ Short Message Service
        - ✍ Mobile Originate
        - ✍ Mobile Terminate

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Service to Roamers

- ✍ Roaming into IS-41 markets
    - ✍ Voice: **Yes**
    - ✍ Call Forwarding: **Probably**
    - ✍ Call Waiting: **Maybe**
    - ✍ Caller ID: **Maybe**
    - ✍ Call Hold: **Maybe**
    - ✍ Voice Mail: **Probably**
    - ✍ Message Waiting Indicator: **Maybe**
    - ✍ 3-Way Calling: **Maybe**
    - ✍ International Direct Dialing: **Maybe**
    - ✍ Short Message Service **Maybe**
        - ✍ Mobile Originate: **Limited Locations**
        - ✍ Mobile Terminate: **Most Locations**

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Troubleshooting

- ✍ Training
  - ✍ All departments involved will have to learn a new set of technologies and new vocabulary

- ✍ Roaming Troubleshooting
  - ✍ New technology
  - ✍ May require purchase of new tools and software

- ✍ Language Barriers
  - ✍ English speaking engineers may or may not be available to help

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Signaling

- ✍ How do I get this all to work in the first place?

  - ✍ Most IS-41 operators use ANSI SS7 as a bearer protocol
  - ✍ Most (non-US) GSM operators use ITU C7 as a bearer protocol
    - ✍ Some STPs do conversions.

  - ✍ The basic functions of IS-41 and GSM MAP are the same, but all the messages are different and carry different parameter names and values.
    - ✍ REGNOT = Location Update
    - ✍ ROUTEREQ = Provide Roaming Number

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Signaling

- ✍ Handset questions for GSM Operators
  - ✍ How do I get handsets?
  - ✍ How do I get IRDBs/PRLs set up right?
  - ✍ How do I get MINs that will work?
  - ✍ How do I get signaling back to my HLR?
- ✍ Handset questions for IS-41 Operators
  - ✍ How do I get handsets?
  - ✍ How do I get SIM cards? How do I get the IMSIs to put in the SIM cards?
  - ✍ How do I get the signaling back to my HLR?

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Other Questions?

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