Reducing the Cost of Data: Wi-Fi Roaming as an Extension of CDMA Roaming

November 15, 2011

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Agenda

• Industry Challenges
  Cost: Exponential Cost driven by Exponential Data use
  Capacity: Cellular can not satisfy data demand alone
  Roaming: Insufficient Coverage & Roaming Relationships

  Reducing your Cost of Data, via Wi-Fi Roaming

• Solution
  Reduce Cost via Wi-Fi (reusing CDMA Data Roaming!)

• Next Steps together
  Wi-Fi Hotspot = CDMA Data Roaming partner
## Both Subscribers and Operators Impacted

<table>
<thead>
<tr>
<th>No Cell Service</th>
<th>Bill Shock</th>
<th>Out of the Loop</th>
<th>Multiple Providers</th>
<th>Multiple Bills</th>
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<tbody>
<tr>
<td>• Wi-Fi access not user-friendly.</td>
<td>• Data roaming prices not viable for mass market use.</td>
<td>• Users turn off data roaming – or their phone altogether</td>
<td>• 85% of Tablets primarily use Wi-Fi for connectivity.</td>
<td>• Users incur credit card charges for Wi-Fi usage from other providers.</td>
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<td>• Limited CDMA and 4G footprint when roaming.</td>
<td>• Worldwide, 96% believe prices are too high.</td>
<td>• Users postpone access to content because of high data roaming prices.</td>
<td>• Users buy Wi-Fi roaming accounts or day passes from other providers.</td>
<td>• Not gaining maximum share of wallet.</td>
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<td>• Not connected outside of 3G range.</td>
<td>• 80% price cuts needed to adopt data roaming.</td>
<td>• Lost service opportunity.</td>
<td>• Not realizing full market potential.</td>
<td>• Not taking advantage of trusted billing relationship</td>
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<td>• Broken relationship with consumer when travelling.</td>
<td>• Bad debt, users fight the bill.</td>
<td>• Lost revenue</td>
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1 ZDNet UK  
2 Chetan Sharma
CDMA Operators rank Wi-Fi Roaming as a top priority (along with required migration to LTE) [CDG IRT, Chicago]
– Actively seeking solution(s), investing in-country

GSM Operators escalated Wi-Fi Roaming as a priority with GSMA Exec Leadership Team (ELT)
– GSM Association + WBA developing Standards (TNS/iPass Solution consistent with standard)

Cable Operators investing in Wi-Fi
Numerous Operators request Wi-Fi Roaming to reduce Int’l data roaming costs

“Verizon to offload 3G/4G data through free Wi-Fi hotspots” TIA, 2011

“Telecom Companies to Jointly Set Up Wi-Fi networks” (SKT, KT, LG)

AT&T Purchases Wi-Fi Operator, Wayport

AT&T: 300% Growth in Wi-Fi Use!

Operator RFIs

Operator Trials

China Plans 1,000,000 Wi-Fi Hotspots to Complement Mobile Nets

O2 purchases Wi-Fi Operator, The Cloud
576 Million Subscribers Worldwide…but limited roaming
- Virtually no CDMA availability in Europe
- South America coverage is decreasing
- Australia has no CDMA
- Spotty coverage in Africa and Middle East
“Service providers deploying a multi-access offload strategy can expect savings in the range of 20 - 25% per annum” [Chetan Sharma]

“We cannot satisfy the demand with macro alone.. [and will] …use Wi-Fi for satisfying dense locations.” [KDDI, CDG Webinar, 10/2011]

**In-market** Cost Reduction: “Wi-Fi Roaming”

**International** Cost Reduction: “Wi-Fi Roaming”
Wi-Fi Roaming Solution (looks like 3G Data Roaming)

- Reuses CRX functionality to reduce impact on Operator (looks like Data Roaming)

Visited Operator

Home Operator

CRX

TNS WiFi Roaming Hub + iPass OMX

Wi-Fi Hotspot = CDMA Data Roaming partner

Wi-Fi Operator

Wi-Fi Connection Manager
Multiple Challenges Solved

TNS CRX

↑ Complete Solution
↑ Established Processes
↑ One Connection
↑ Risk Free
↓ Zero Capex
↓ Reduce Complexity

TNS Wi-Fi Roaming Hub

↑ Reuse Existing Interfaces
↑ Speed to Market
↑ Roaming Coverage
↑ Network Capacity
↑ Roaming Experience
↑ Free Networks
↓ Service Delivery Costs
↓ Churn

iPass Open Mobile Exchange

↑ Geographic Reach
↑ Data Roaming Affordability
↑ Customer Satisfaction
↑ Profitability
↓ Churn
Solution: Wi-Fi Hotspot as Data Roaming partner

Wi-Fi Hotspot

- Wi-Fi Connection Manager
- CDMA 3G
- Access Controller
- Serving AAA
- Internet

Operator Roaming services (CRX)

- Reporting, Rating & Care
- Financial Settlement
- Mediation
- Record Conversion

AAA Proxy

Home Carrier

- Customer Care
- Billing system
- Data Svcs
- AAA
Solution: WiFi Roaming Hub – Minimal Operator Impact

Goal: Avoid Impact to CDMA Operator

Wi-Fi Roaming via TNS WiFi Roaming Hub mimics 3G Data Roaming
Global Wi-Fi Footprint

601,726 Access Points
116 Countries & Territories

- 2,465 Airport Hotspots
- 58,076 Hotels & Convention Centers
- 21,000 Free Wi-Fi Hotspots
- Premium in-flight Wi-Fi services available on 3,800 U.S. flights daily
- Mobile broadband in the US, China, UK and Japan

As per ISO 3166 country code list
Goal: Relieve greatest load from Smartphones

- Smartphones are largest consumers of bandwidth
  - iPhone (55%) and Android (16%) dominate traffic

Forecast: Global Smartphone and Modem Monthly Data Consumption

Source: “iOS’s Internet market share hits a record 54.65%,” Elmer-DeWitt, Cable News Network, 10/1/2011.
Focus on Smartphones and Tablets

Target: Relieve Smartphones data traffic, the greatest data load on 3G networks
iPass Roaming Client – Roaming Connection

1. Wi-Fi networks are available.
   - Tap to connect

2. Connecting to 242G3
   - yucca
   - 242G
   - thebarisopen
   - berrybutton

3. Online with Wi-Fi
   - yucca
   - Connected since 6:15 PM

Transaction Network Services
Ramp-up of Use: Client software for Wi-Fi Roaming

Initially:
- Smartphones need software
  a) Download an Application
  b) Application built into phones (by Operator mandate)

Goal (2 years):
- Smartphones have software
  a) Download an Application
  b) Application built into phones
Benefits of Data Offload via Wi-Fi Roaming

✓ **OPEX Cost Savings**  
  • Wi-Fi per MB rates lower than equivalent roaming costs

✓ **CAPEX Savings**  
  • Increased Capacity with offload in high-usage venues

✓ **Network Coverage Improvement**

✓ **Reduced Churn Potential** (avoid sticker shock)

✓ **Extended Customer Relationship** (billing, content)

✓ **Revenue Creation from new Roaming Partner**

✓ **No network impact**  
  • Reuses existing Data Roaming solution (CRX)
Next Steps

1) Obtain benefits from current technology

2) Plan to incorporate enhancements (e.g., Next-Generation Hotspot)

3) Assist in CDG IRT efforts

WBA White Paper: “Maintaining Profitability of Data Services” [TNS]
Thank you!

Q & A