Seamless Integration of WLAN and GSM/3G Networks

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Outline

• Introduction to Transat
• WLAN – Opportunities and Challenges
• Integration of WLAN and GSM/3G Mobile Networks
  – Authentication and payment options
  – Network architecture
  – Security
  – Mobility and Roaming
  – Mobile service connectivity
• Summary
Introduction to Transat

- Founded in March 2000
- Headquartered in Southlake, Texas
- Investors:
  - Bay Partners, Intel, Genesis Campus, Acorn Campus
- 35 employees and consultants
- Complete WLAN solution
  - Optimised for Hotspot deployment and management
  - Both central as well as local controller products
    - Offers flexibility and ability to manage large number of hotspots
    - Enables low cost deployment at local venues
  - Carrier grade, field proven
  - All available authentication methods
    - Enterprise level security with smart card authentication
IEEE 802.11 Based WLAN

• 802.11 based WLAN rapidly gains acceptance in public hotspots, enterprises and homes, due to:
  – Unlicensed spectrum allocation (2.4 and 5 GHz bands)
  – Internationally accepted standards
  – Low cost
  – High data rates
  – Wired LAN equivalence (e.g. IP support)

• Target areas for WLAN deployment
  – Airports, hospitals
  – Shopping malls, restaurants
  – Office buildings, libraries, convention halls
  – Homes and residential communities
Market Opportunities

• Accelerated growth, by 2007:
  – World wide hotspot locations: 120,000
  – Total hotspot users: 67M
  – Revenue from hotspots: $9.16B worldwide, $3.50B United States
    (WLAN believed to generate $1.67B in 2003 - ABI)

• Operators are studying and rolling out WLAN solutions
  – Wireless ISPs
    • Isolated hotspots
    • Authentication mostly based on User Name/Password, some adopt SIM or smart card based procedures
    • Simple pricing schemes
  – Telcos
    • Huge customer base and rich infrastructure
    • Standalone WLAN deployment or integrated with their existing infrastructure?
    • Is WLAN a threat or an opportunity?
WLAN Disconnected from Mobile Data Networks

- WISP 1
  - AP
  - AC
  - Data GW

- WISP 2
  - AP
  - AC

- Internet

- AAA
- Billing System

- Data GW
- Mobile Operator 2
- Billing System

- Billing Clearing
- Mobile Aggregator

- Signaling/Roaming Exchange

- WISP 1
- AC

- Mobile Operator 1
  - Appl Server
  - Billing System

- Internet

- AAA
- Billing System

- Internet

- AAA
- Billing System
Challenges and Strategies

• WLAN Challenges
  – Limited mobility
  – Authentication, security and billing
  – Power consumption
  – Interference and frequency availability
  – Business model

• WLAN Strategies for Telcos:
  – Integrate WLAN into their 2.5G and 3G networks as a complementary solution
  – Leverage their existing network resources
  – Turn a threat to an opportunity
Operator Basic Requirements

Carrier Needs
- Existing Infrastructure
- Higher ARPU
- Short term ROI Standards

Security
- EAP-SIM, Web Based
- Smart Cards
- VPN

Standards
- Standards Based Architectures

OSS Integration
- Service Integration
- Billing Integration
- Customer care
- Network management

Technology
- Off the shelf
- Simple to use
WAIN - Mediation Software System for WLAN Integration

Operator

Subscription/Authentication

Gateway/Mobility Agent

WAIN

Authentication

Traffic

Billing

WLAN Operator

Visitor
Multiple Access & Payment Options

Voucher
Wireless Internet
User id: guest
Password: a7tw2k
4 hours access
Price: $10

Mobile Phone Payment (SMS)

Credit Cards

SIM Cards
Smart Cards

Subscriptions
Registered users may log in here.
User Name: 
Password: 
Log In
Network Architecture

- Management Station
- Payment Server (Credit card, Pre-paid card, Mobile phone)
- Internet
- Billing System
- AAA
- Mobile Billing System
- Mobile Network
- HLR (SIM based)
- SS7 Signaling Gateway
- Centralized WAIN Server (Fast Enabler)
- Centralized Hotspot Control
- Localized Hotspot Control
- WAIN Server
- WAIN Server
- WAIN Server
- Mobile Network
- Billing System
- Routing + AP
- SIM
- SIM
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- SIM
- SIM
802.1x and EAP-SIM for Enhanced WLAN Security

- 1x/EAP Client
- 802.11 1x-AP
- Authentication (EAP) SERVER
- HLR/AUC

- EAP/PEAP
- EAP-SIM
- GSM Auth
- MAP

802.1x and EAP-SIM for Enhanced WLAN Security
WAIN Deployed in WeRoam Service

Source: WeRoam
Mobility Support in Integrated WLAN and GPRS/UMTS Networks

Context transfer & data forwarding
Mobile Services Extended to WLAN

The diagram illustrates the integration of Wi-Fi hotspots into the mobile network architecture. Key components include:

- **WLAN Hotspot**: Access points providing Wi-Fi connectivity.
- **WAIN Server**: Servers for Wi-Fi Access Network Interface (WAIN) services.
- **SGSN ( Serving GPRS Support Node)**: Gateway node for packet-switched data services.
- **GGSN (Gateway GPRS Support Node)**: Gateway node for Internet Protocol (IP) data services.
- **HLR (Home Location Register)**: Store of subscriber information.
- **VoIP GW**: Gateway for Voice over Internet Protocol (VoIP) services.
- **MMS Server**: For Multimedia Messaging Service.
- **Location Server**: For location-based services.
- **Portal Server**: For content delivery and web services.
- **Internet**: The wide area network for data exchange.

The diagram shows data and signaling flows between these components, highlighting the integration of mobile services extended to Wi-Fi networks.
Best Connected Data Services

Using travel time to download emails and send files

Working from home in your kitchen, bedroom, or even patio

Mobility within an enterprise

Information anywhere with an 802.11 enabled cell phone

Accessing the Internet from the local coffee shop

Source: Intel
Unique WLAN Hotspot Solution

• Enables Several Payment Methods
  – Pay-on-the-spot credit card, subscription based UserID/Pswd, Vouchers, pre-paid and post-paid and Mobile Phone subscription integration (SIM)

• Targeted at multiple local public and semi-public networks
  – Unique solution for those specific needs

• Service Provider Transparent – with ready made commercial arrangements
  – Service Provider Transparency maximizes users different needs
  – Partner with a Hosting Service Provider for low cost service entry
  – Trusted Billing relationships can be re-used
    • Global Roaming Partners
    • Credit Card Payment Providers
Summary

• WLAN provides a low-cost solution for high-speed wireless data transfer. WLAN growth will continue to accelerate.

• Integration of WLAN with mobile network infrastructure enables best connected mobile services
  – Unified user identification and security
  – Integrated billing
  – Seamless mobility and roaming for WLAN users
  – Transparent mobile services at higher speeds

• Transat provides a complete WLAN solution
Thank You!

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