ICC 2002 Panel Discussion
WLAN Technologies and Business Opportunities

Wireless Hotspots and WISP Roaming

Joel E. Short, Ph.D.
Chief Technology Officer
Nomadix, Inc.
jshort@nomadix.com

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About Nomadix

NOMADIX

- **Vision**
  Enable transparent and secure high speed Internet access for the nomadic user

- **Market Dynamics**
  - Mobile workforce demanding ubiquitous access
  - Worldwide rollout of public access wireless broadband hotspots
  - Global roaming standards and alliances emerging:
    - WECA WISPr committee
    - Pass-One

- **Manufacturers**
  Public Access Control (PAC) Gateway
  (**U**niversal **S**ubscriber **G**ateway) with enabling functionality for Wireless Hotspots and WISP Roaming

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About WECA and WISPr

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WECA = Wireless Ethernet *Compatibility* Alliance
- Wi-Fi = IEEE 802.11b, 2.4Ghz, up to 11Mbps
- Wi-Fi5 = IEEE 802.11a, 5Ghz, up to 54Mbps

WiFi ™
The Standard for
Wireless Fidelity

WISPr = Wireless ISP roaming
- Allows Wireless Hotspot Operators to gain additional revenue from roaming users

Some of the Members include:

here are
NOMADIX
GRIC
FUNK SOFT WARE
iPass
intel
agere systems
proxim
NTT
WAYPORT
Sprint
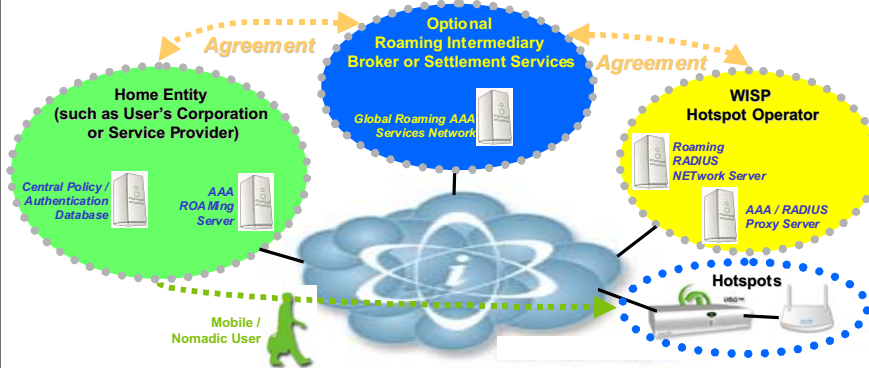illuminet
Cisco Systems
TELIA
TSI
NEC
TOSHIBA
Microsoft

WECA's WISPr Committee:
- Writing Document: "Best Current Practices for Wireless ISP Roaming"
  - Describes a Universal Access Methodology and examines enhancing/future technologies
  - Completed document for initial release, but awaiting IPR statement release
  - Currently Confidential to WECA Members

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Wireless Hotspot Roaming Players and Business Opportunity

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Optional
Roaming Intermediary
Broker or Settlement Services

Agreement

Agreement

Home Entity
(such as User's Corporation
or Service Provider)

Global Roaming AAA
Services Network

WISP
Hotspot Operator

Central Policy /
Authentication
Database

AAA
ROAMing
Server

Roaming
RADIUS
NETwork Server

AAA / RADIUS
Proxy Server

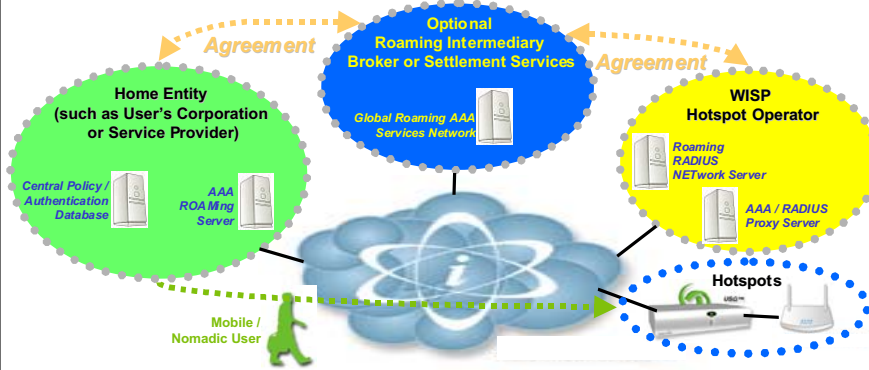Hotspots

Mobile /
Nomadic User

Home Entities:
- **Definition:** *"who the Mobile / Nomadic User has a billing relationship and account with (may not be a Wireless Hotspot Operator)"*
- **Examples are**: Service Providers, Corporations, and WISPs Themselves

- **Additional roaming revenues from users without having to deploy WLAN infrastructure**

- **Augments existing remote access service offerings**

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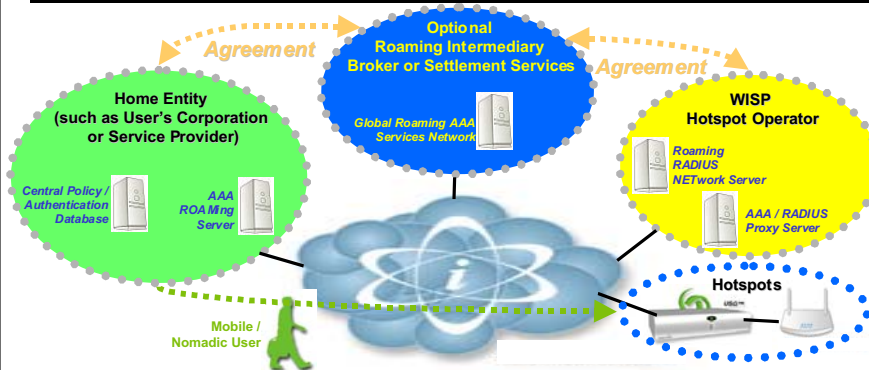# Wireless Hotspot Roaming Players and Business Opportunity

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Roaming Intermediaries:

- **Definition**: *"participate in the Authentication and Accounting Process between multiple Hotspot Operators and various Home Entities"*
- **Examples are**: Remote Access (dialup) Providers and Settlement (cellular) Carriers/Providers

- Provides Home Entities with aggregated WLAN hotspot locations for their users
- Provides WISP Hotspot Operators with aggregated customer base of provisioned nomadic users

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WISP Hotspot Operators:

- **Definition:** *"deploys public access WLAN networks (e.g., Wi-Fi) and public access control gateway functionality"*
- **Example locations**: airports, restaurants, hotel rooms, company lobbies, conference rooms, apartments

- Providing WLAN access attracts customers
- Roaming brings additional revenues without cost of customer acquisition / provisioning
- Cost sensitive infrastructure build out

Case Study

1) User associates with "open mode" Access Point at hotspot
2) Opening Browser automatically presents "Captive Portal Page" with local content/services
3) User can authenticate (login) at hotspot via either
    – Universal Access Method - Any Internet Browser, or
    – Smart Client (e.g., iPassConnect or GRIC client) typically containing hotspot location phonebook, single-click login, remote VPN, etc., or
    – 802.1x client (e.g., Windows XP) utilizing EAP, Strong Authentication tokens, etc.
4) User gets profile-driven, personalized Internet access
5) User gets automatically redirected to their Internet Start Page

Wireless Hotspot with WISP Roaming Nomadic User

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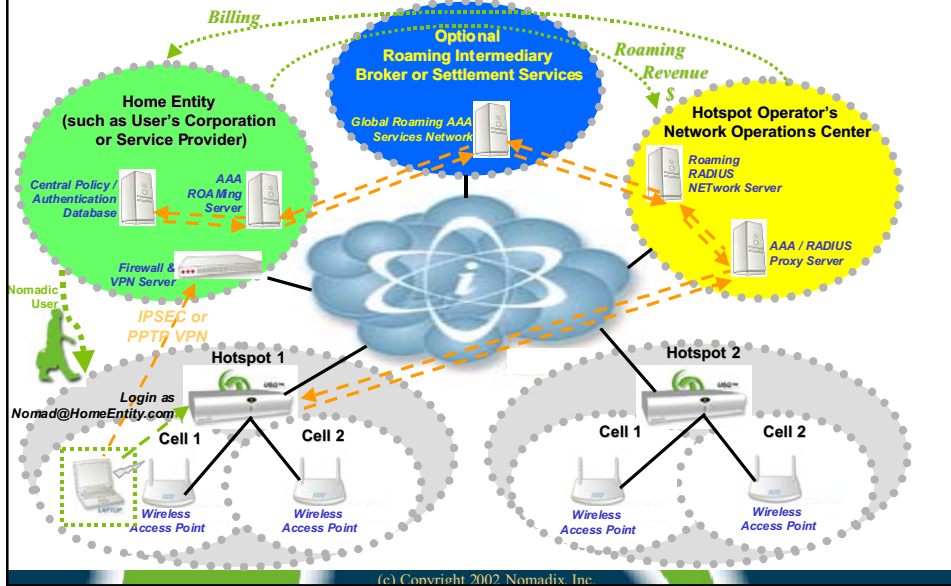
Hotspot Technology Overview

- Plug-and-play connectivity
  - IP Address Management (public vs. private address assignment)
  - *Dynamic Address Translation* (DAT)™
    - For supporting users with: static IP Addresses, has a DHCP address from another subnet, going through public-private address translation
  - VPN Support (PPTP and IPSEC)
    - Especially when user's IP address is being translated

- Local Content/Service Presentation
  - Home Page Redirection (HPR)
    - Automatically redirect nomadic user to local portal/welcome page
  - Transparent Proxy
    - For supporting Browsers configured for Proxy or private DNS Server that could be behind a firewall
  - Captive Portal – per user IP filtering / access control
    - White List for free/allowed sites
    - Black List for blocked/restricted sites

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Hotspot Technology Overview

- Secure Authentication
  - Roaming user specified NAI (username@HomeEntity.com)
  - Browser based authentication utilizing SSL to protect user's credentials
  - 802.1x/EAP based authentication for end-to-end strong authentication (MD5, certificate-based, SIM card, etc.)
- Enforcement of user-authorized specific services
  - Redirection of user to specified Start Page after authentication
  - Enforce specified maximum session/connect time
  - Enforce QoS (maximum bandwidth) per user
- Billing/Accounting for usage
  - Interim Accounting Record updates to prevent loss of billing
  - Automatic implicit logoff (e.g., don't continue billing for access once user goes out of range)
- Support for various (retail and wholesale) billing models
  - Pre-paid, pay-per-use, flat, usage-based, local, or via roaming

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Thank You

Joel E. Short, Ph.D.
Chief Technology Officer
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