Collaborative or Competitive Relation between Public Wireless LAN and existing Mobile Services

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Public Wireless LAN is very young

- Public Wireless LAN systems just started its evolution towards its universal development.

- Service operators are also striving to establish business model for Public Wireless LAN (this presentation is to introduce these effort)
  - Don’t have to be pesimistic; Wireless LAN can provide very very cheap infrastructure
What is “Public Wireless LAN” service?

- Internet access service provided by Wireless LAN
  - originally developed for private usage.
    - Management procedure can be completed between AP and STA

- Service area
  - Airport, Coffee shop, Hotel Lobby, Long distance train (e.g. Shinkan-sen)

- Speed
  - IEEE802.11b (most popular standard) 11Mbps
  - IEEE802.11a 54Mbps
Application field of Public Wireless LAN and existing mobile service

- Low necessary speed
  - E-mail
  - Search engine
  - Corporate web sites
  - Voice mail
  - Video mail

- High necessary speed
  - Cellular
  - PHS
  - VoIP
  - 802.11b
  - 802.11a
  - Movies

- Voice mail
- Video mail
Architecture of Public Wireless LAN

- HOTSPOT area
- Corporate intranet
- VPN secure access
- Access to Company LAN or Online trading
- Access to contents server
- the Internet
- Contents Provider
- Easier than Wired LAN
- Station
- Cafe
- Hotel lobby

HOTSPOT area

Corporate intranet

Contents Provider

Easier than Wired LAN

Station

Cafe

Hotel lobby

Access to contents server

the Internet

Access to Company LAN or Online trading

VPN secure access
Problems to overcome

- Network providing authentication and accounting
- Smaller terminals necessary
- Access Points are hard to find
  - Numbers of APs should be increased
  - Roaming function is necessary
  - Operators should form alliance
  - Community network approach
  - Seamless roaming with existing public mobile network
- Killer application
  - Difficult to earn enough money only from internet access service
  - VoIP
  - Long distance express train or Airplanes
Authentication: Improvement is necessary

- Reason: As mentioned, original authentication procedure is completed between APs and STAs

- Authentication server can be reached from public places

- IEEE 802.11i standardization is ongoing and finishing its work

- Some operators introduced non-standardized procedure and started its service

- Improvement is done
The initial screen of WEB browsing authentication

WEB Browser
Welcome to Hotspot
Customer ID
Password

authentication procedure is triggered by first http request
Web browser authentication (from different perspective)

- Capture http request and sends authentication information to authentication server
- Transfer packet to internet only after authentication succeeds.
Web browser authentication

Launch browser
Input user ID and password

Authentication node

BI

Authentication succeeded (SSL/HTTP)

Authentication completed

Wireless connection

Reject terminals with wrong encryption key for wireless connection

ESS-ID configuration
WEP key configuration

Launching browser
Input user ID and password

Database

userA
passA
userB
passB

Reject inconsistent user ID and password

Authentication information inquiry
Accounting

- Most obvious difference between public service and private network, which does not have accounting function

- Hotspot service (NTT Com)
  - Share the same accounting ID with PHS (Personal handyphone system) or OCN
    - Necessary to integrate services
  - ¥350/day for @nifty user
  - Prepaid card
    - ¥500 for 1 day passport (4 Euro)
    - Quite effective to promote the service (¥500 may be acceptable to the customers)

- HP transat software
PDA

- Flets spot (NTT West)
  - Linux (embedix) terminals
    (Zaurus Schedule management information can be downloaded from the PC in home
  - ¥59800
  - 120g
  - Battery duration 12h
Roaming

Customer of operator A

Both AP is available if A and B are roaming each other

If A and B is not roaming, AP B is not available
Roaming mechanism

Information flow of roaming

Local authentication server

Roaming server

Local network

Internet

Roaming server

Remote network
Roaming

- **WISPr standard**
  - Wifi standard
  - Web base authentication mechanism and RADIUS server
  - Does not proceed enough

- **iPass**
  - Utilizes existing roaming function for the dial-up internet access service
  - Working together with NTT Com and NTT-ME

- **Passone**

- **Operators Alliance (economical approach based on scale merit)**
  - Cometa established by intel, AT&T, IBM
  - Cometa and iPass announced to work together

- **Fast roaming (uses Inter Access Point Protocol)**
  - IEEE 802.11f

- **Trial service by NTT Com and NTT-BP and NTT-ME**

- **Wifi-zone**
  - Brand to ensure interoperability
  - NTT-ME
Community network

- Solution to increase the number of Access Points without investment

- Access Points are owned by person who wants to earn money and operators will charge for internet connection and accounting function and authentication function

- Kick-back system and sells accounting server software

- Examples
  - Mflets (NTT east)
    - ¥700 for 1 access point
  - Sputnik
  - Joltage
Collaboration with mobile phone network

- Experimental stage
- M-zone
- IEEE 802.11 WNG started discussion
- b-access software realizes seamless switching between PHS data communication service and Hotspot service by NTT Com and some other Public Wireless LAN service
VoIP

- Obviously attractive.
  - Lower price voice service can be provided
- Difficulty in mobility support
  - Wireless LANs are not developed to support high mobility
  - PDA only. Change of the concept of the service from origin.
- Battery duration period is several hours
- Neo-mobile
  - Trial service completed
Shinkansen (Long distance train)

- Extremely desired service
  - Customers are isolated from the information (Internet) for several hours.

- Japan Railway (JR) and NTT-ME are launching Public wireless LAN service for Shinkansen Customers
  - Provided in Platforms where “Nozomi” stops
  - Free trial service starts this April.

- ISP roaming is provided
  - Same ID can be used
Conclusion

- There are ongoing work
- Breakthrough Necessary
  - Portable = small terminal = small screen
  - Broadband = High definition moving picture
    = Large screen
- The demand for the mobility support may be different between Public Wireless LAN and mobile phone
- It is necessary to create Application other than phone and e-mail and WEB-browsing
- It is possible to launch Public Wireless LAN service with smaller investment.
  - We can establish business model through the trial and error experience. (Prepaid card is good example)