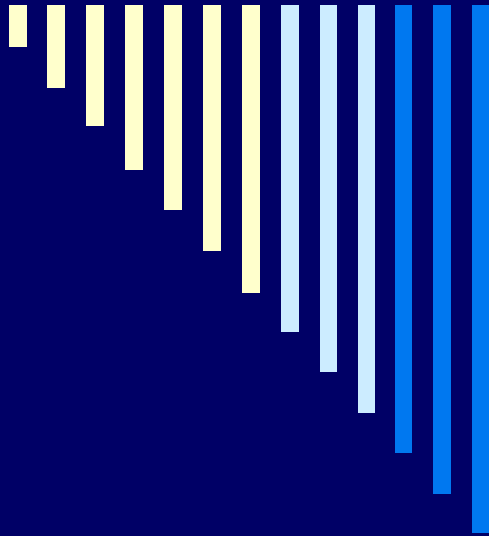



WiFi vs. GPRS vs. 3G: What's the answer?

Victor Bahl

<http://research.microsoft.com/~bahl>

Microsoft Research



Disclaimer

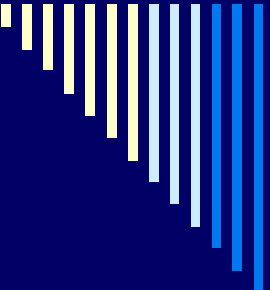
These are my personal opinions only
and not necessarily that of Microsoft
Corporation

Reality in Pictures



August 21, 2002

Victor Bahl



What do I know about this subject..

The Choice Network (Jan. 1999 – Nov. 2001)

- Public Area WiFi Network (PAWN) deployed in Crossroads Shopping Center, Bellevue, Washington, USA

Features

- Intranet and Internet access
- Global authentication
- Privacy for users and security for operators
- Differentiated services based on policies
- Location based services
- Roaming support between multiple networks
- Packet level accounting
- Ease of deployment



Broadband wireless Internet connectivity & location services in public places: <http://www.mschoice.com>



Eat, Drink and Be Connected

You can now access the corpnet and Internet at Crossroads Shopping Center using the same wireless technology ITG has deployed in this building.

Enjoy a great meal, listen to live music, watch the passing parade – while doing your e-mail, collaborating with campus colleagues on a presentation or doing research on the Web.

Microsoft Research is testing a suite of wireless access protocols and applications in a trial at Crossroads. To participate you will need to provide your own hardware (e.g. a laptop and ITG-approved 802.11 wireless network card) and install some beta software. If you're interested, please email choice@microsoft.com, or check out <http://choice.com>.

CROWN
Crossroads
Wireless
Network

Sign up now!

Microsoft

Choice
Network

CROSSROADS
SHOPPING CENTER

Microsoft
Research

The
CHOICE
Network

Version: Beta 1
Copyright (c) 2000
Microsoft Corporation



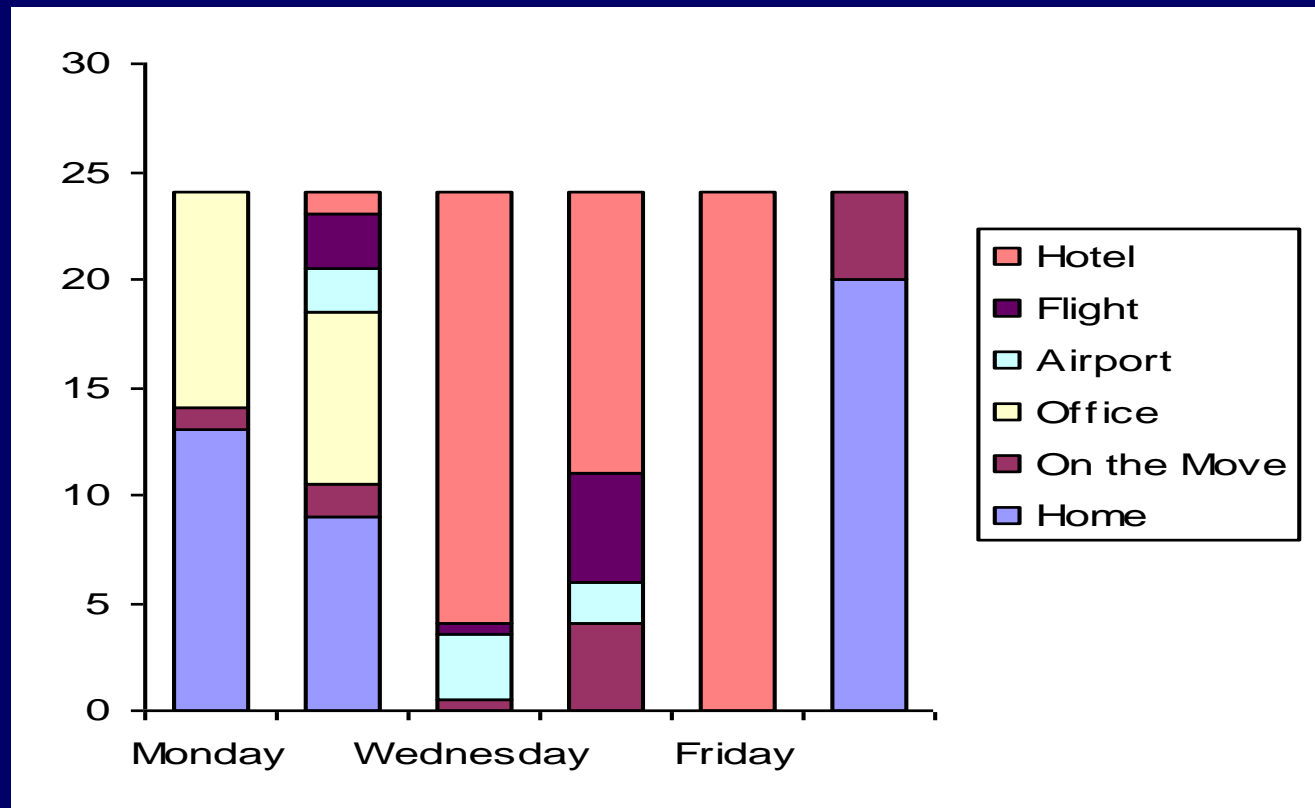
The case for PAWNs

High Tech Traveling Professional

(me 😊)

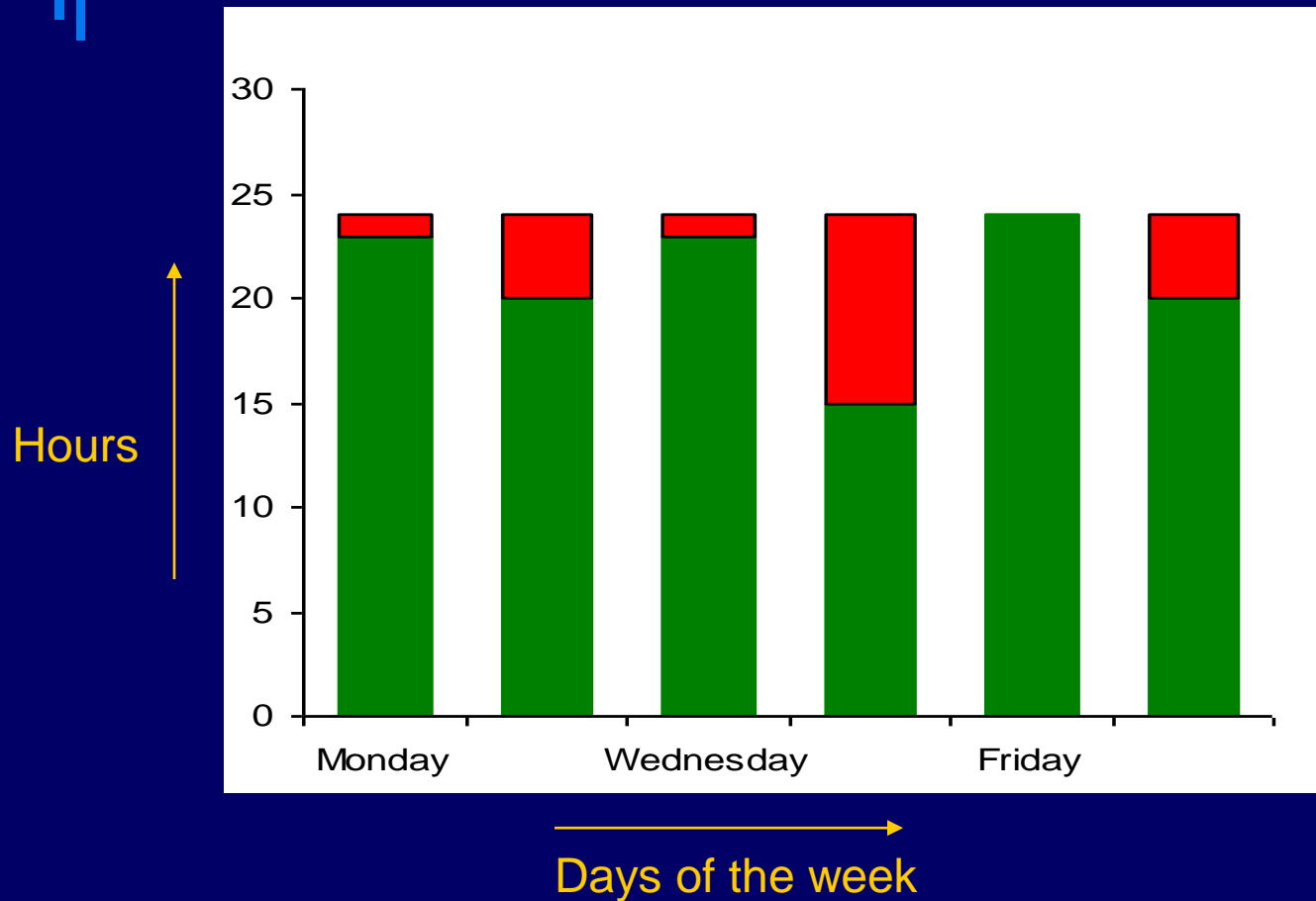
Sample of my activities between June 17–22, 2002

Hours



Days of the week

Amount of time I spent indoors (green) versus outdoors (on the move) (red)



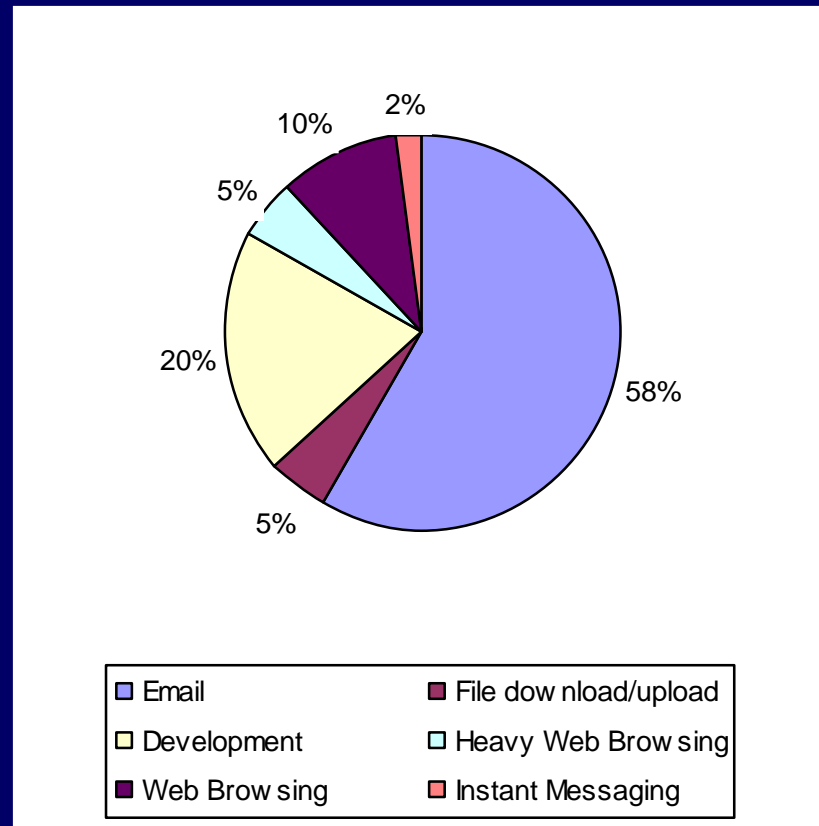
So, what's more useful for someone like me?
What should we focus on doing well?

Providing (fast) Internet access when I am indoors?

or

Providing (slow) Internet access when I am outdoor -
when I am moving?

What do I do when I am not in my office



So, what do I really need?
nG or Ubiquitous WLANs

Any service nG provides, PAWNs can provide better plus more
and PAWN access is generally less expensive



PAWNS .vs. nG

Issues with PAWNS

- Build out has to happen
- Operation in the ISM band is questionable.....but its global ☺
- Form factor has to improve, devices have to be available
- Energy consumption has to be reduced.

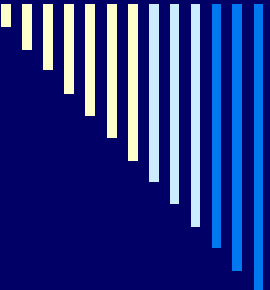
However with PAWNS

- The world is your office ..only better
- Lower cost than nG (do you really want to pay \$100 / month for a few 100 bits/sec?)
- Much higher bandwidth.. much better experience...thus greater productivity
- Innovation of services – PAWNS are built using open protocols
 - Location aware applications
 - ...



Build out for PAWNs? What's the value chain ?

- ✓ WISPs deploy PAWNs
 - Waveport,....
- ✓ WISPs deploy PAWNs but are bought out by traditional CSPs
 - Verizon/Mobilestar,...
- ✓ Individual's deploy PAWNs
 - **The CHOICE Network approach**



WiFi Devices are already out there and more are coming

July 29, 2002: “Qualcomm to add WiFi to phone chips”, CNET News.com

Phone with built-in WiFi

- Symbol's Netvision Phone
- SpectraLink's NetLink Wireless Telephone
-

PDAs with built-in WiFi

- Toshiba's e740
- Compaq's H3970 with WiFi Sleeve
- ...

Laptops with built-in WiFi

- Dell, IBM, Compaq, Gateway, HP laptops

WISPs don't have to worry – users already have the devices

Not convinced...consider the
following....



WiFi vs. GPRS vs. 3G: What's the answer?

The Wall Street Journal

August 21, 2002 (today)

“KPN to write down its 3G Investment”

3G write downs during the last month (in Europe alone)

August 20, 2002:	KPN NV	\$8.79 billion
July 25, 2002:	Sonera	\$4.20 billion
July 24, 2002:	Telefonica	\$4.78 billion

Bottom line

PAWNs have a bright future – their availability will lead to greater empowerment for users through better and faster connectivity

Focus on PAWNs!



Thanks!

P. Bahl, et. al, *“PAWNs: Satisfying the Need for Ubiquitous Secure Connectivity and Location Services,”* IEEE Wireless Communications, Vol. 9, no. 1 (February 2002)

<http://www.mschoice.com>

<http://research.microsoft.com/~bahl>
