Applications and Trends in Wireless Consumer Networking

NOMS'2006

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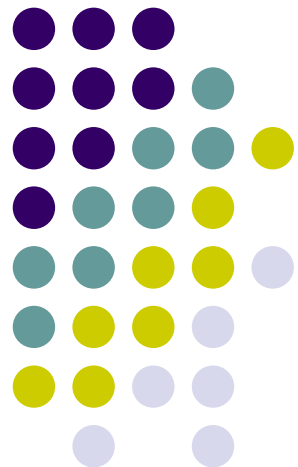
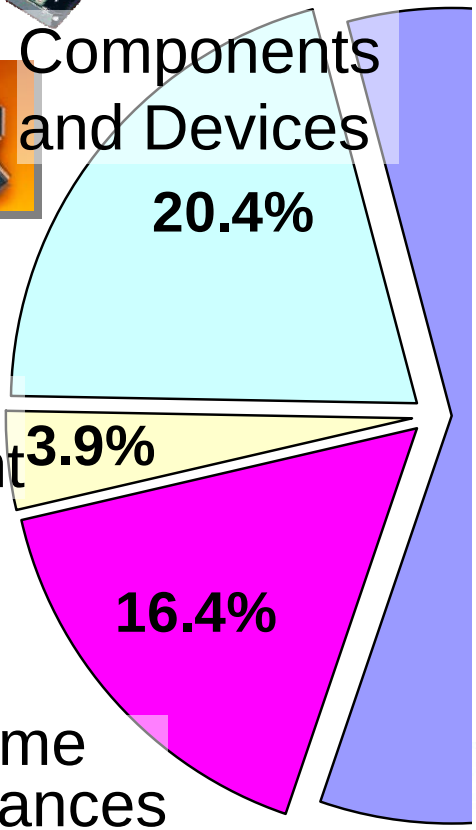


Foundation of Panasonic

Founded in 1918
by Konosuke MATSUSHITA (23)
with his wife (22) and
brother-in-law (15)

First Product:
attachment plugs

Sales Revenue: $81.44B

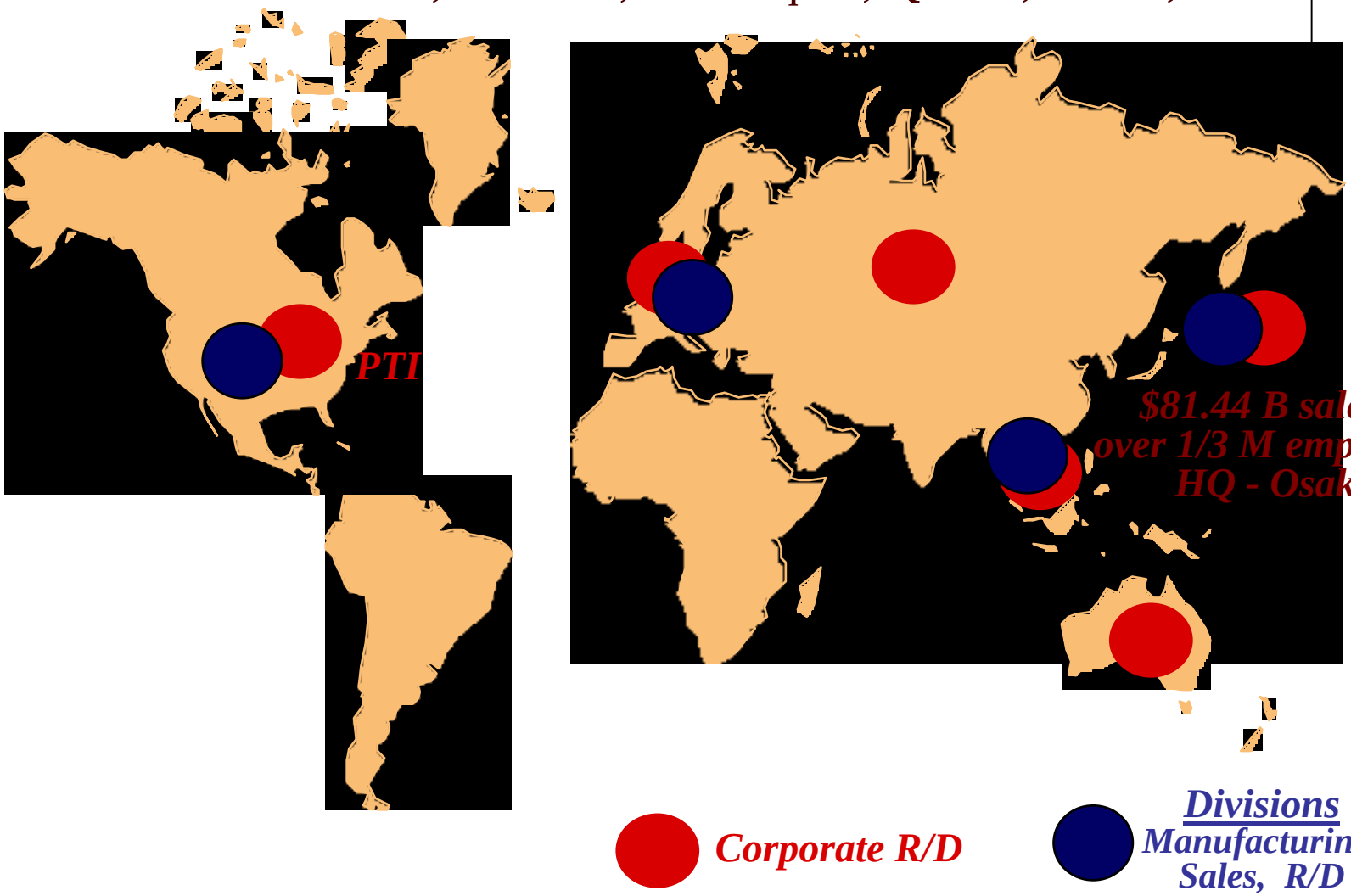


Industrial Equipment

Home Appliances

Matsushita Electric Industrial Co., Ltd - MEI

MEI Brands: Panasonic, National, Techniques, Quasar, Victor, JVC



Outline

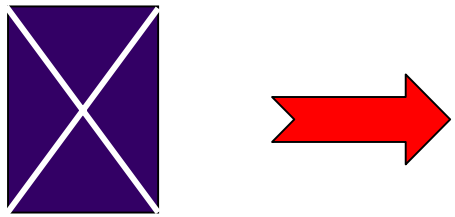
1. Access Infrastructure and Services
2. Ubiquitous Peer-to-Peer Paradigm
3. Consumer Networking Applications Examples
4. VoIP and Service Management Issues

Disclaimer

All technical ideas and notions presented in this talk do not represent the official position of Panasonic on any of the issues addressed here. The functionality of devices illustrated in this presentation does not represent reality and/or features currently present or planned for Panasonic products.
It is just a vision of Panasonic Research Labs.

Communications/Services,/Infrastructure Evolution

Vertical Market, Provisioned, Operator-driven



Open, Self-governed, opportunistic

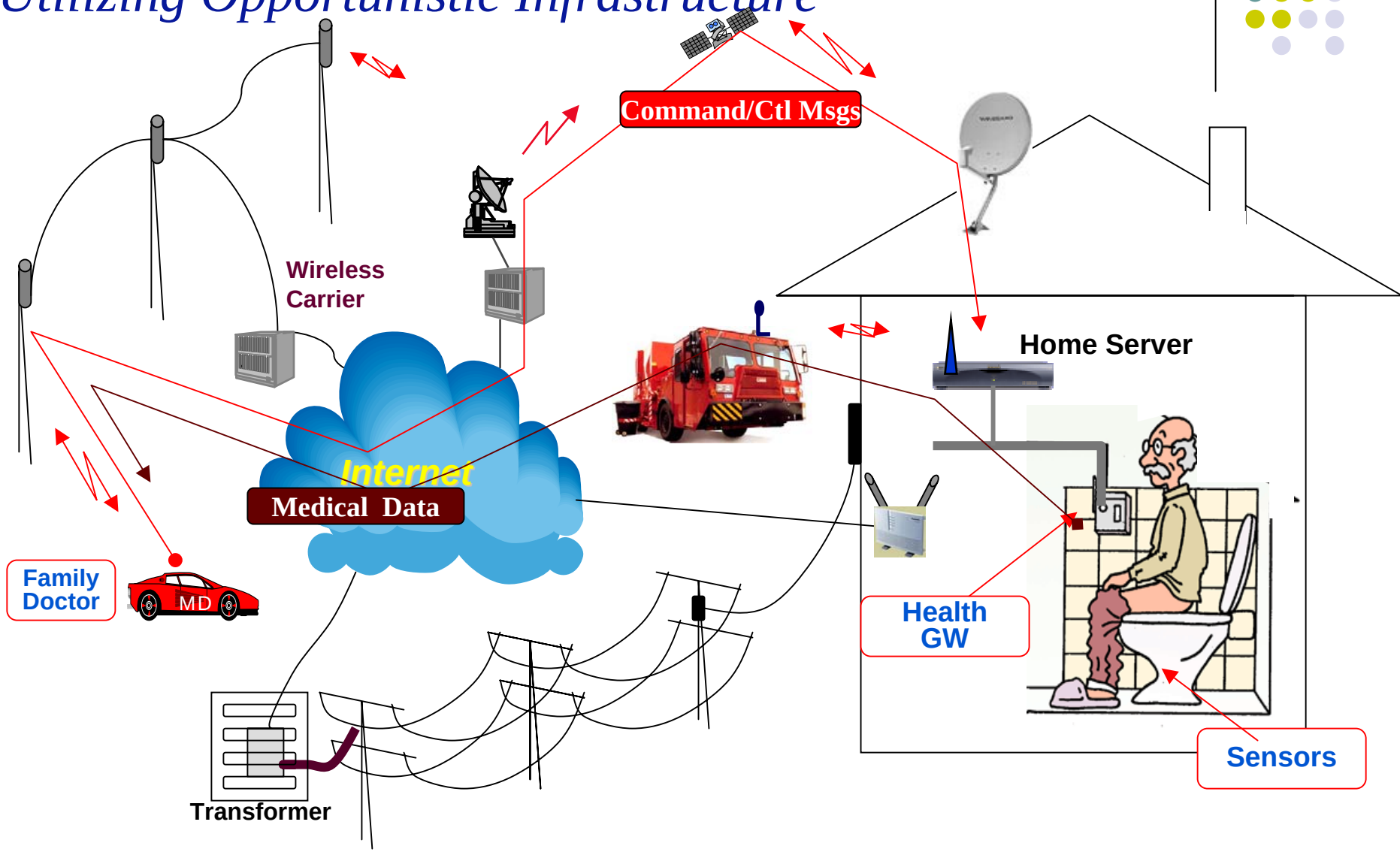
Communications Infrastructure evolution:

- From circuit switched to packet switched
- From application-specific to generic data services
- From provisioned to opportunistic

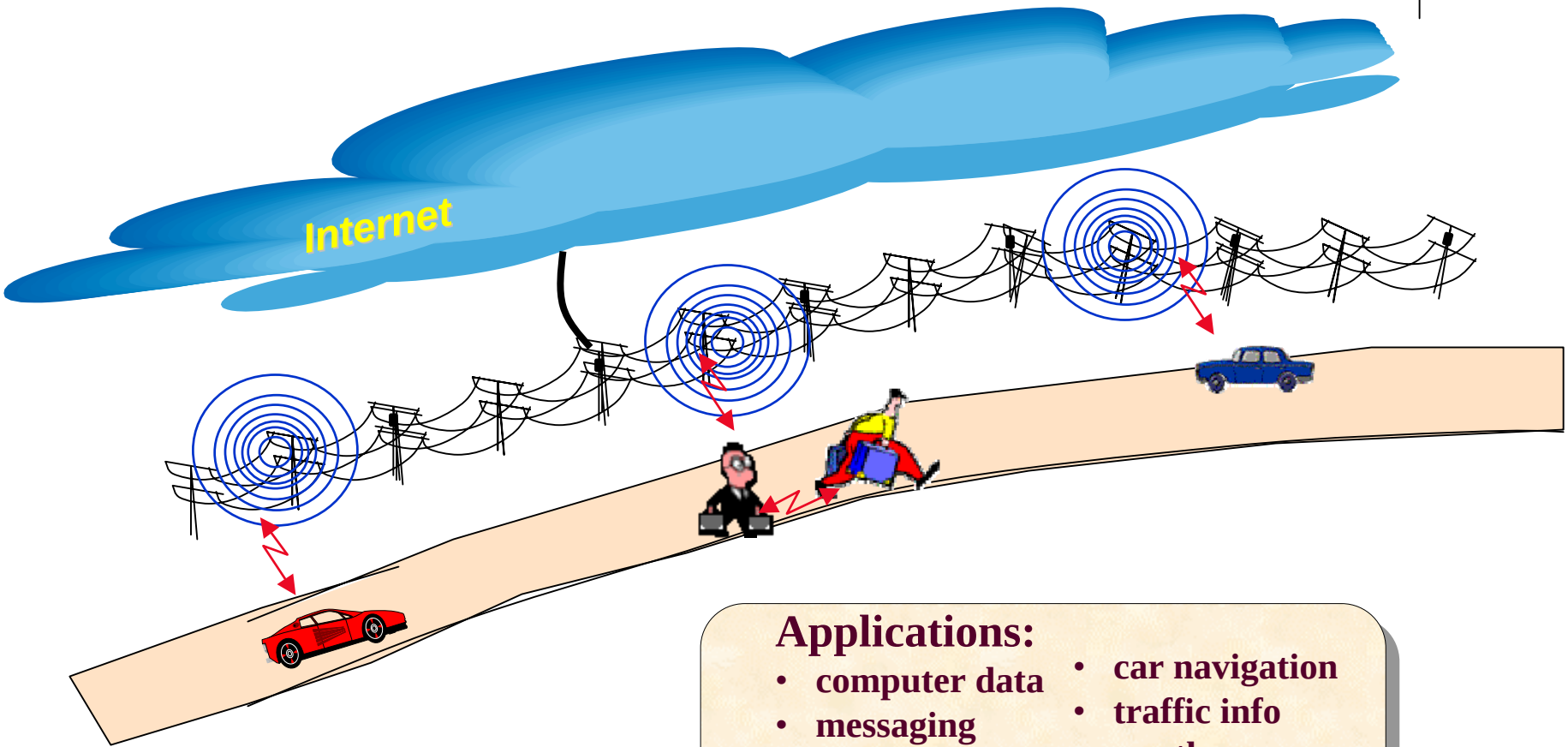
Opportunistic Infrastructure:

- Users already connect to the internet using multiple providers: at home, at work, in cafés, airports, trains and aero planes, hot spots.
- More and more municipalities in US plan public wireless coverage of entire metropolitan areas with WiFi and/or WiMax
- Internet access is becoming ubiquitous, universal, and accessible, and… inexpensive…, like water….

Utilizing Opportunistic Infrastructure



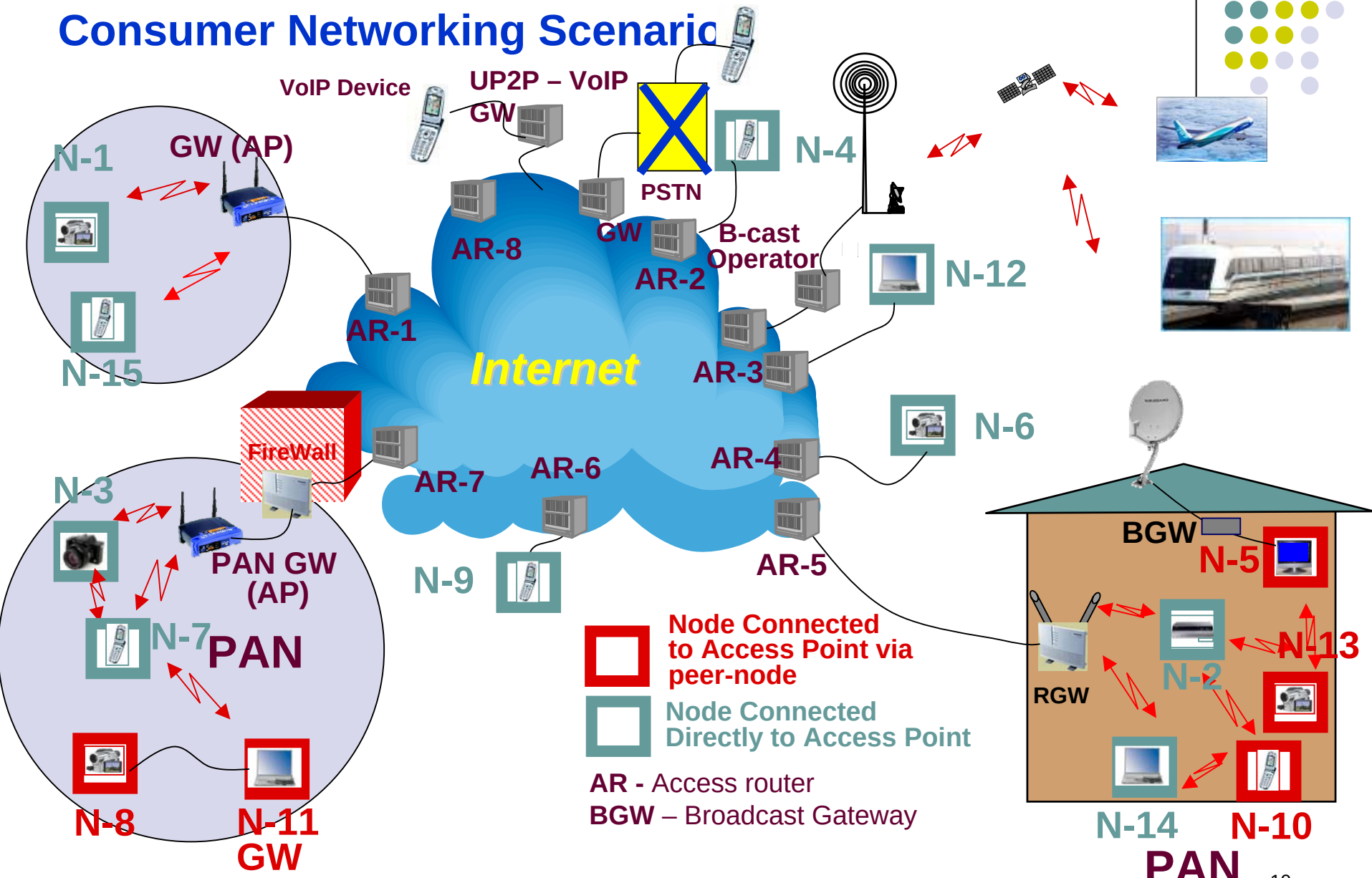
Ubiquitous Broadband Scenarios
RoadRange: BoPL – to - Mobile



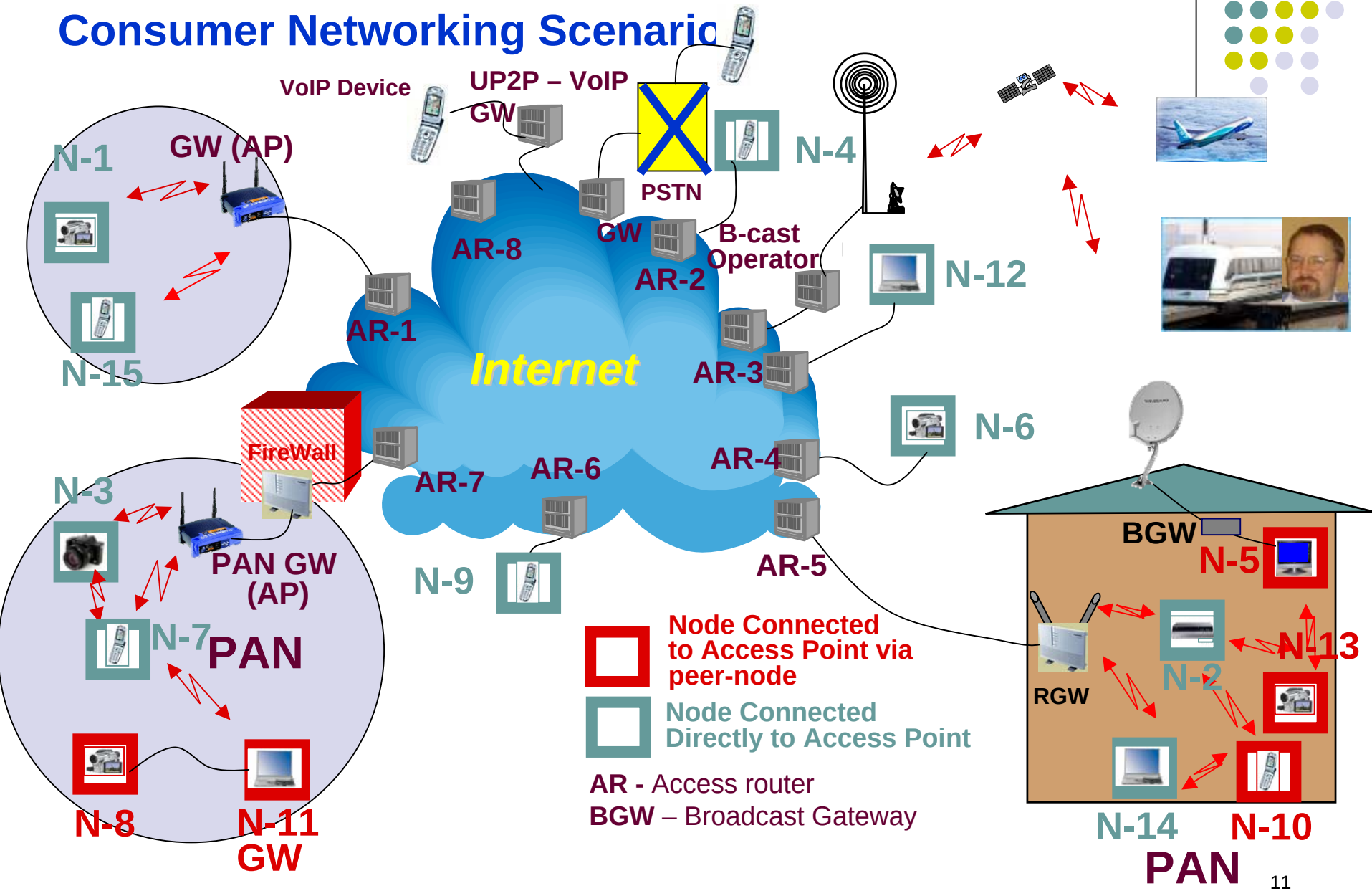
Applications:

- computer data
- messaging
- E-commerce
- web
- car navigation
- traffic info
- weather
- emergency svc

Consumer Networking Scenario



Consumer Networking Scenario



Internet Access for People

Wireless Philadelphia: Mission Statement

- Promote Open Metro-scale Wireless Connective Citywide
- Wireless Philadelphia aims to strengthen the City's economy and transform Philadelphia's neighborhoods by providing wireless internet access throughout the city.
- Wireless Philadelphia will work to create a digital infrastructure for open-air internet access and to help citizens, businesses, schools, and community organizations make effective use of this technology to achieve their goals while providing a greater experience for visitors to the City.

Internet Access for People

US Cities go Wireless

Mayor Hahn:

”I want **Los Angeles** to remain at the leading edge of innovation and creativity, We need wireless access to the Internet everywhere in the city – not just in select locations. I believe that Wi-Fi and ‘next generation’ technologies will help us bridge the digital divide.”

THEWIRELESSWEBLOG, Oct. 26, 2004

- **Pittsburgh** has a Wi-Fi project that eventually is expected to cover a four-square-mile area of downtown.
- **New York City, San Francisco and Atlanta** also have undertaken Wi-Fi projects through public and private entity collaborations, as well of commercial access.
- The city of **Cincinnati** soon will launch an effort to bolster the availability of Wi-Fi technology

Business Currier, October, 2003

Ubiquitous Peer-to-Peer Paradigm

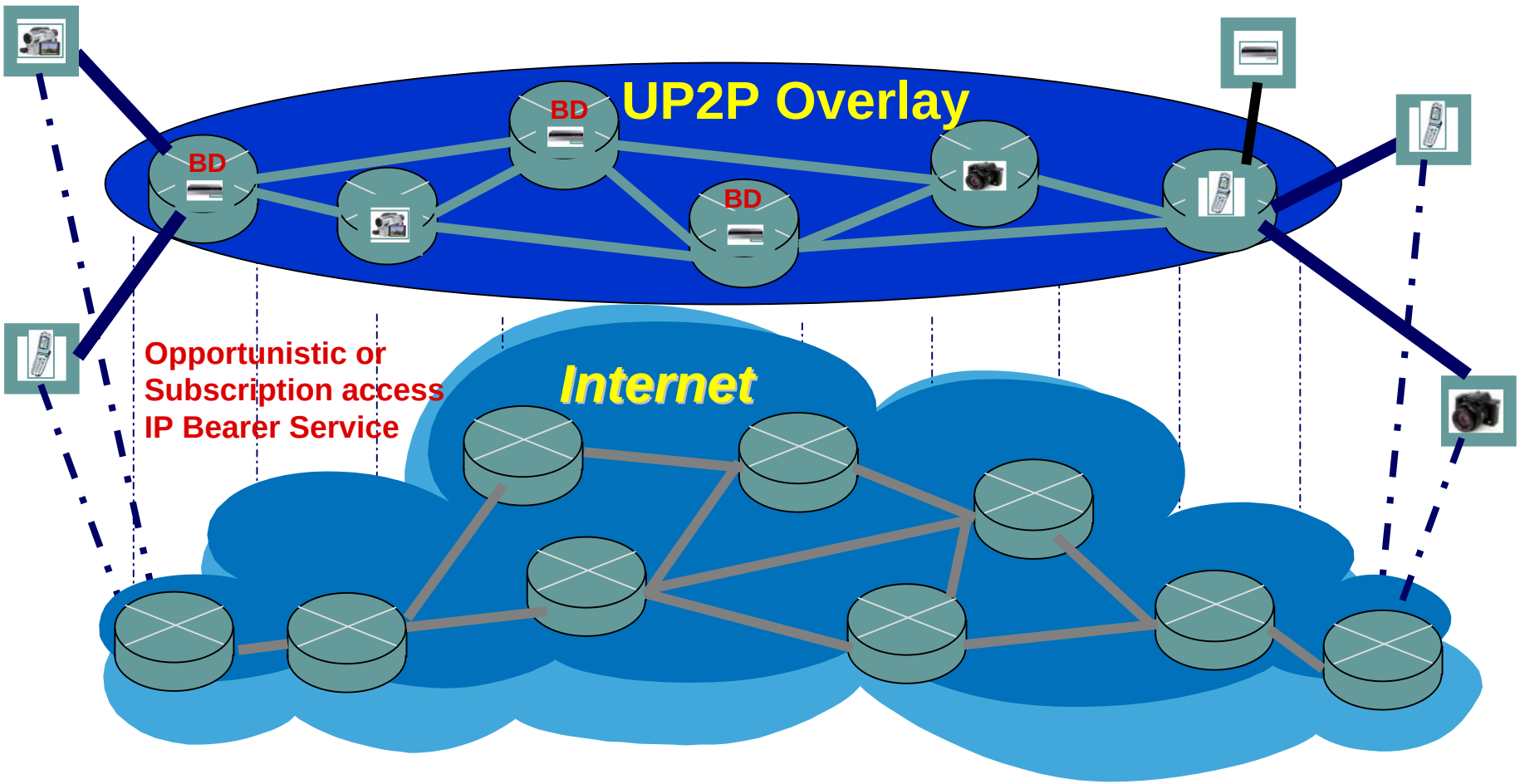
Ubiquitous Peer-to-Peer Concept implies a world of Consumer Electronic devices, which are networked by utilizing generic IP bearer service. Devices form P2P overlay networks and assume various functions that are necessary to support a wide set of applications.

Devices are cognitive of their environment and adopt to it. They utilize the infrastructure opportunistically.

These networks are self organized and self-maintained.
If they are managed then only by the device manufacturers or by a third party enabled by the device manufacturers.

P2P Services

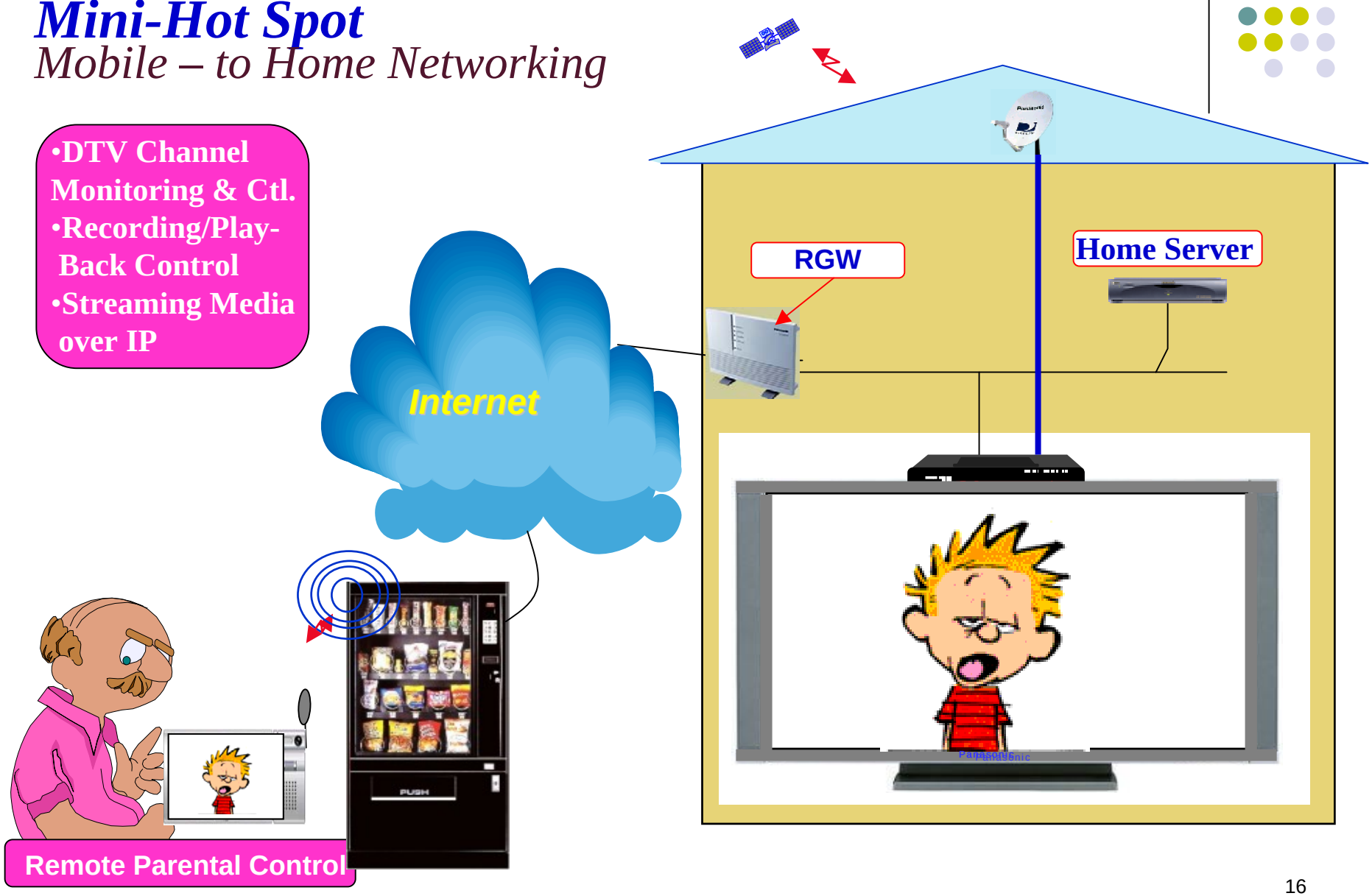
Users will know only one provider – the one whose logo is on their device or the supplier or the P2P software client



Mini-Hot Spot

Mobile – to Home Networking

- DTV Channel Monitoring & Ctl.
- Recording/Play-Back Control
- Streaming Media over IP



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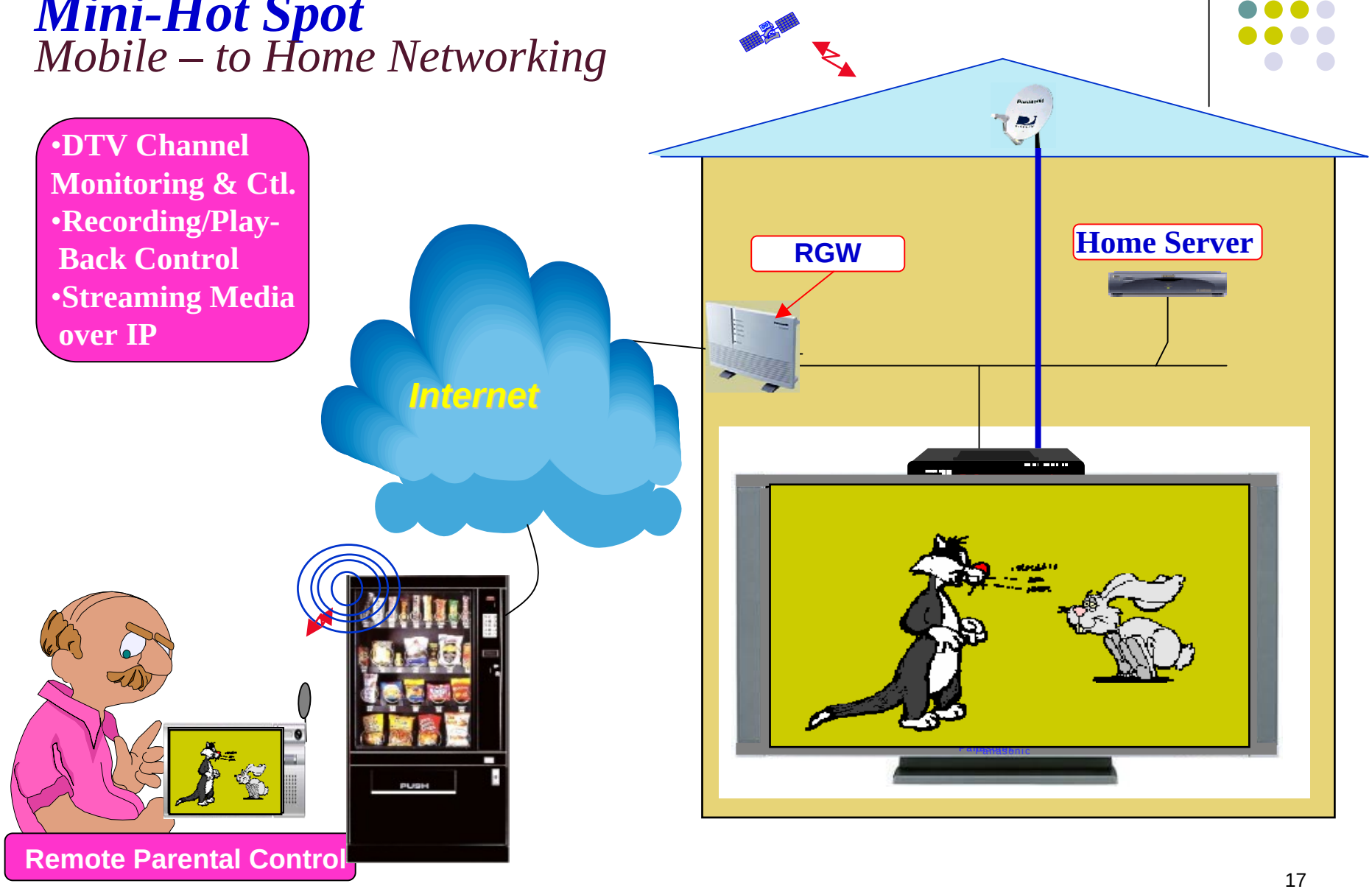
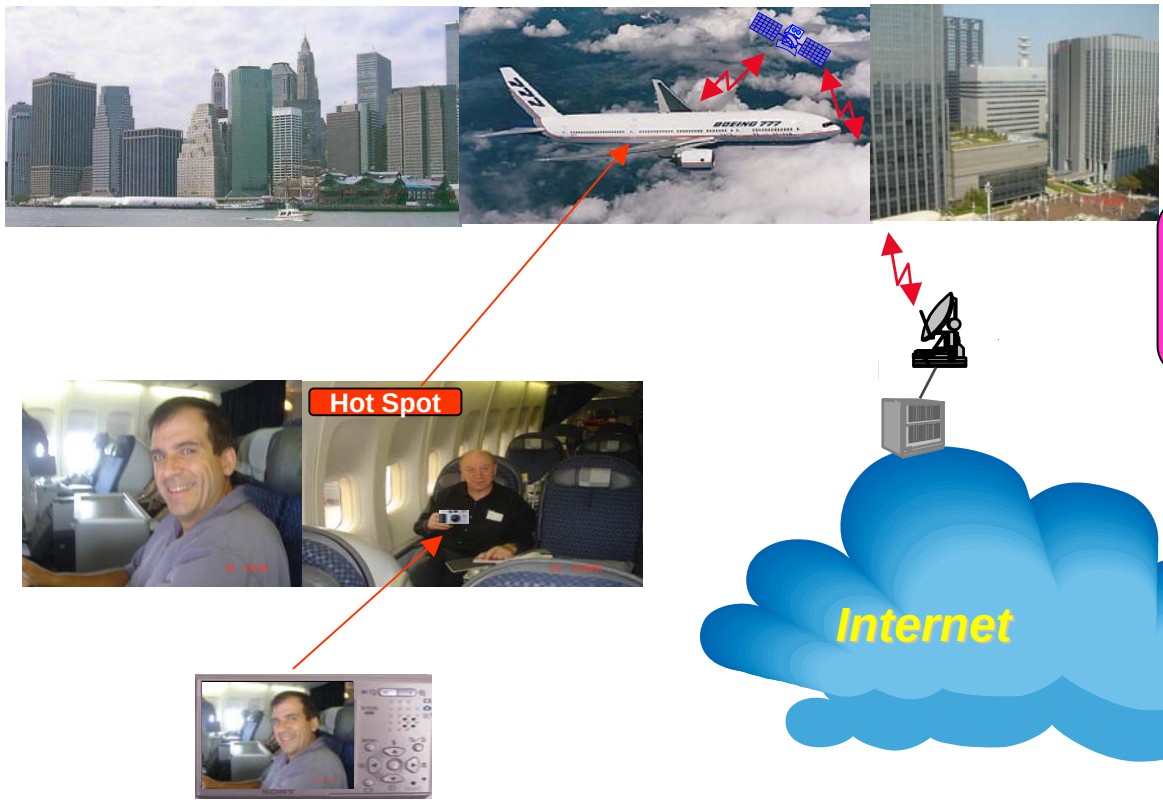


P2P Networking via Opportunistic Infrastructure

Air-to-Home Application



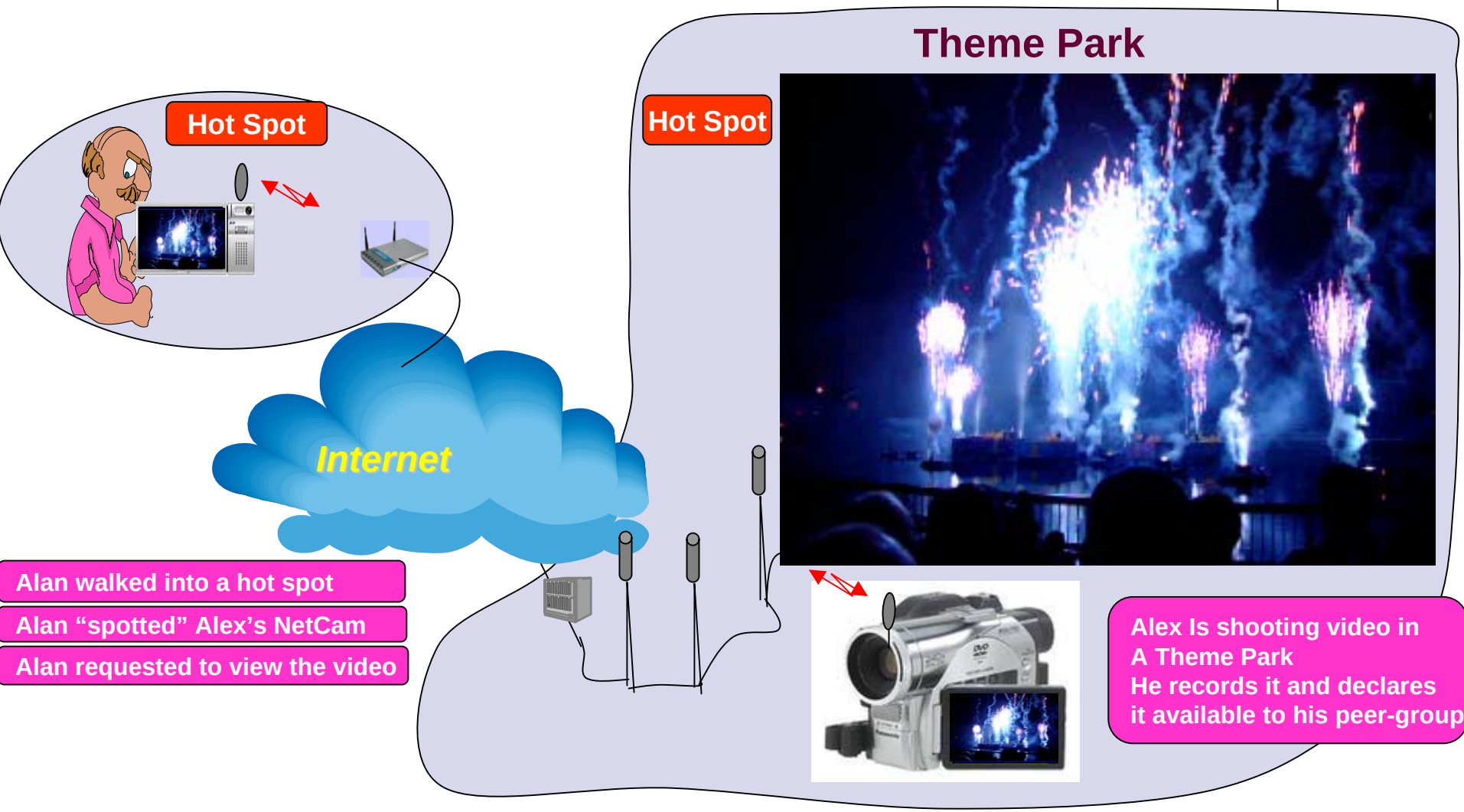
P2P Networking via Opportunistic Infrastructure & Ad-Hoc GW

Personal Content Sharing Application Locally and Globally

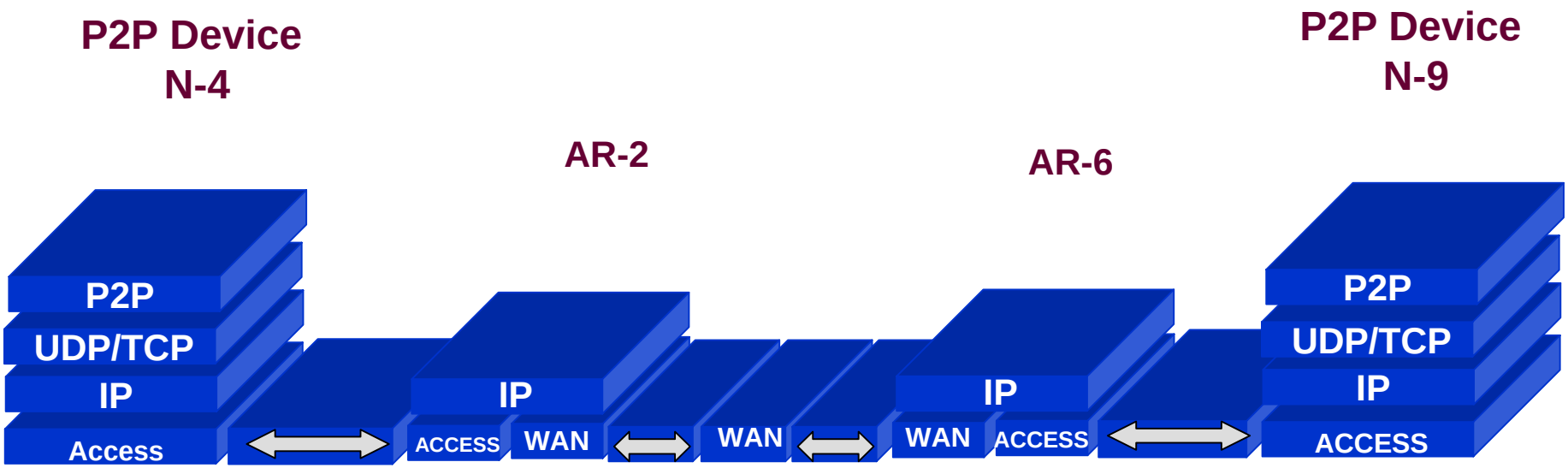
Scenario:
Alex shares Disney World pictures with Lenard and also with Alan. Alex and Lenard are in NY, while Alan is in Shinagawa. Lenard's A/V device is dual mode and it found an opportunistic connection to Internet via GPRS/GSM

WiFi and P2P Networking

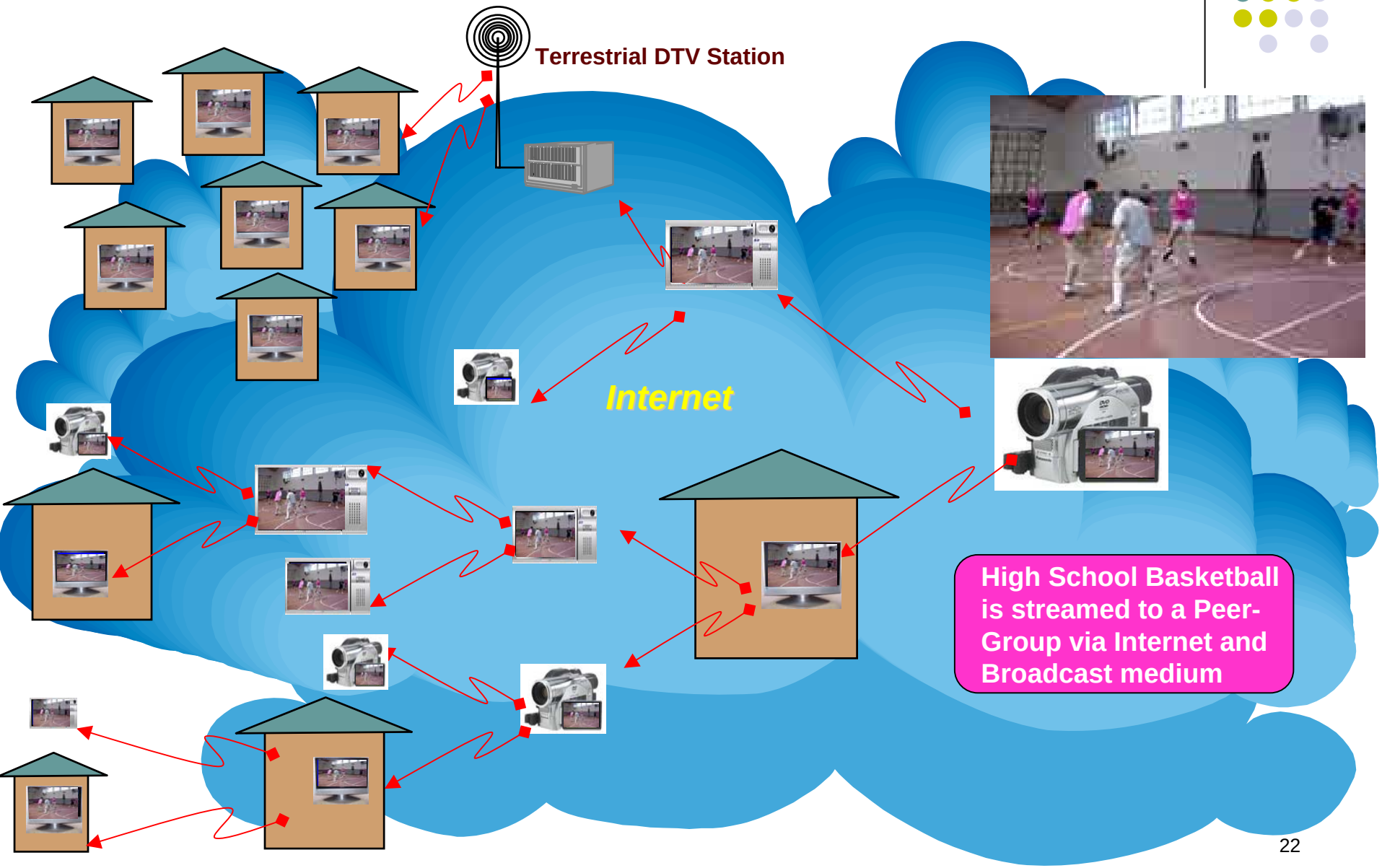
HotSpot –to- HotSpot Personal Content Streaming Application



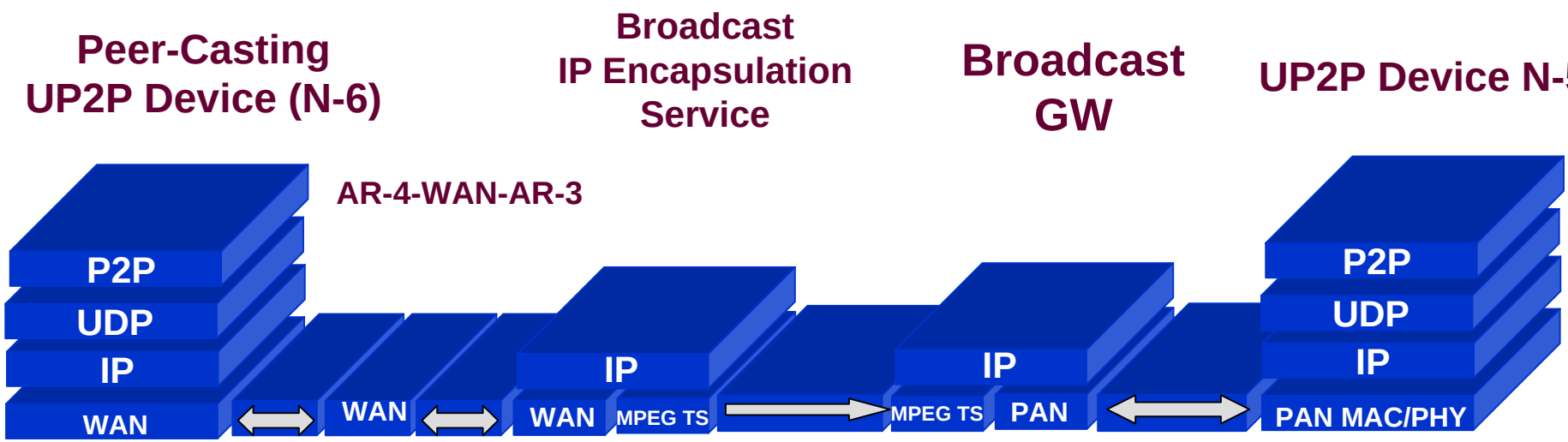
P2P Applications
Global Peer-to-Peer Communications



Hot Spot Originated Peer-casting



Broadcaster's IP Encapsulation Service
Peer-Casting to Home

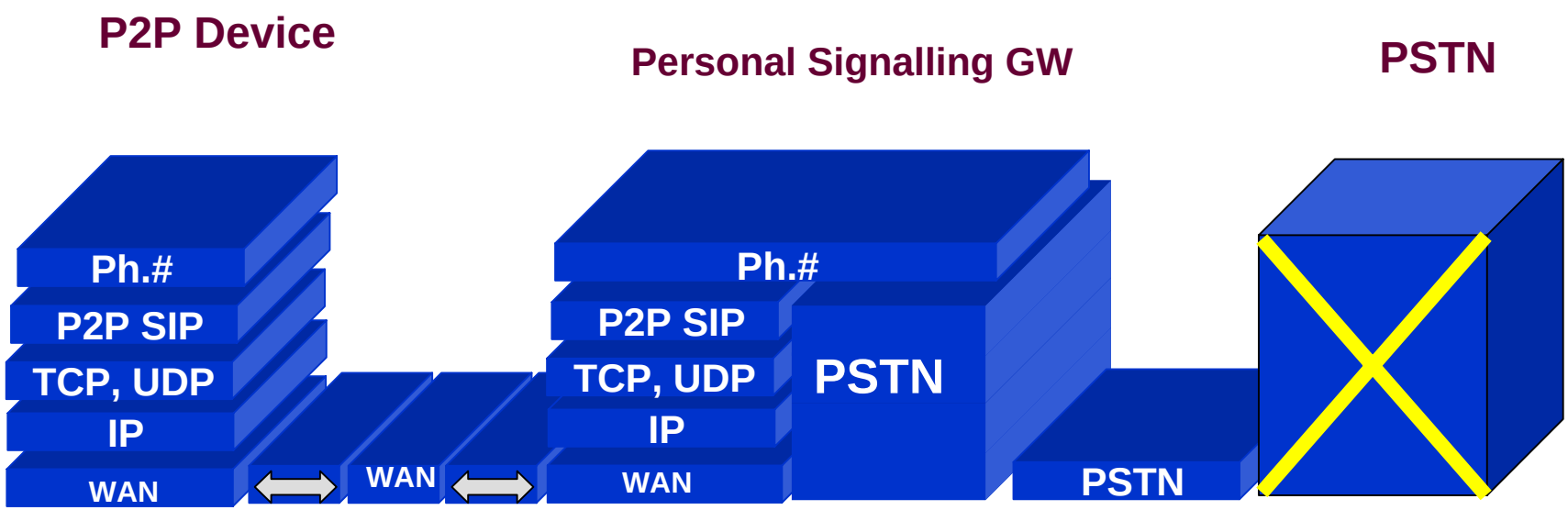


High Speed Mobility Access and P2P Networking

Train-to-Home & Train-to-Cellular

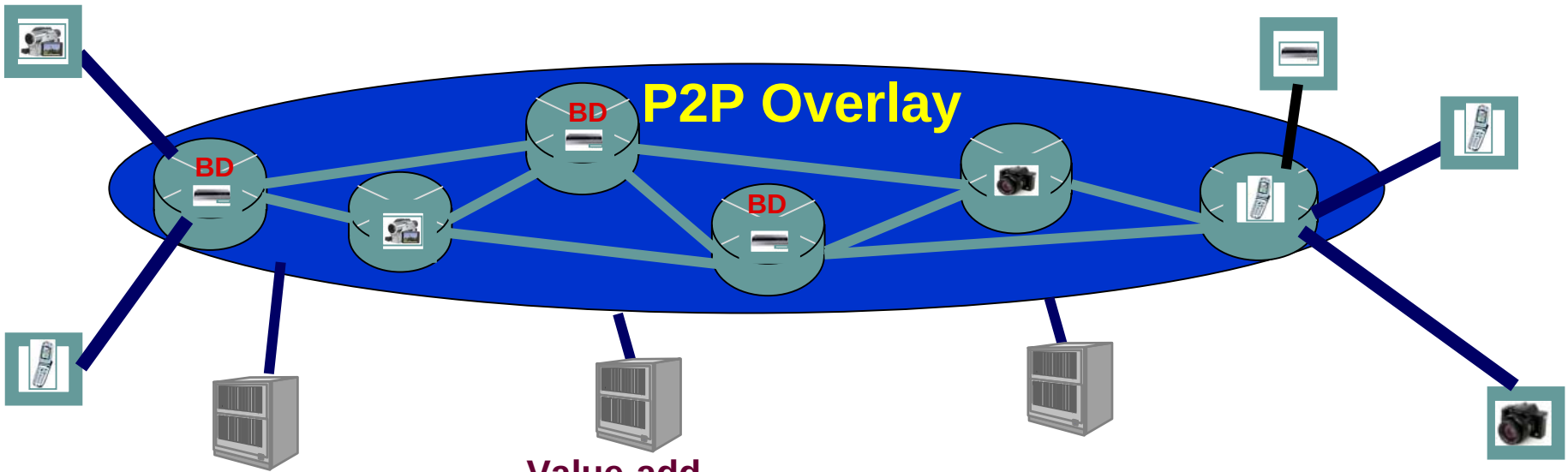
Application:
Alan from the Tokyo-Osaka train using High Mobility Access shares pictures with his family and talks to John by VoP2P via Alan's personal PSTN Gateway

VoP2P – to - PSTN
Personal Telephony Gateway



P2P Service

The Paradigm Shift



Content Distribution/DRM
Service Operated or enabled
by terminal supplier

Value-add
Communications
Services
Operated or enabled
by terminal supplier

Managing P2P Domain,
Device In-field support

In P2P World Terminal Client suppliers are at the root of the Services Value Chain

What's Missing

- Widely available WiFi
- Global Roaming Mechanism for WiFi
- Universal sign up standard adopted for WiFi access

What's is Not Missing from Service Providers

- VoIP provider's infrastructure
- Management of the VoIP service for Consumer Networking Scenarios
- Policing/discriminating user traffic based on applications
- Usage – sensitive billing for access

What's is Possible

- Value-add Services to P2P Networks, like PSTN or VoIP Gateways
- Providers supported DHT service to P2P systems
- Hosting login/authentication Service
- Hosting in-field support mechanisms
- Hosting super node infrastructure
- Providing cross-domain gateways