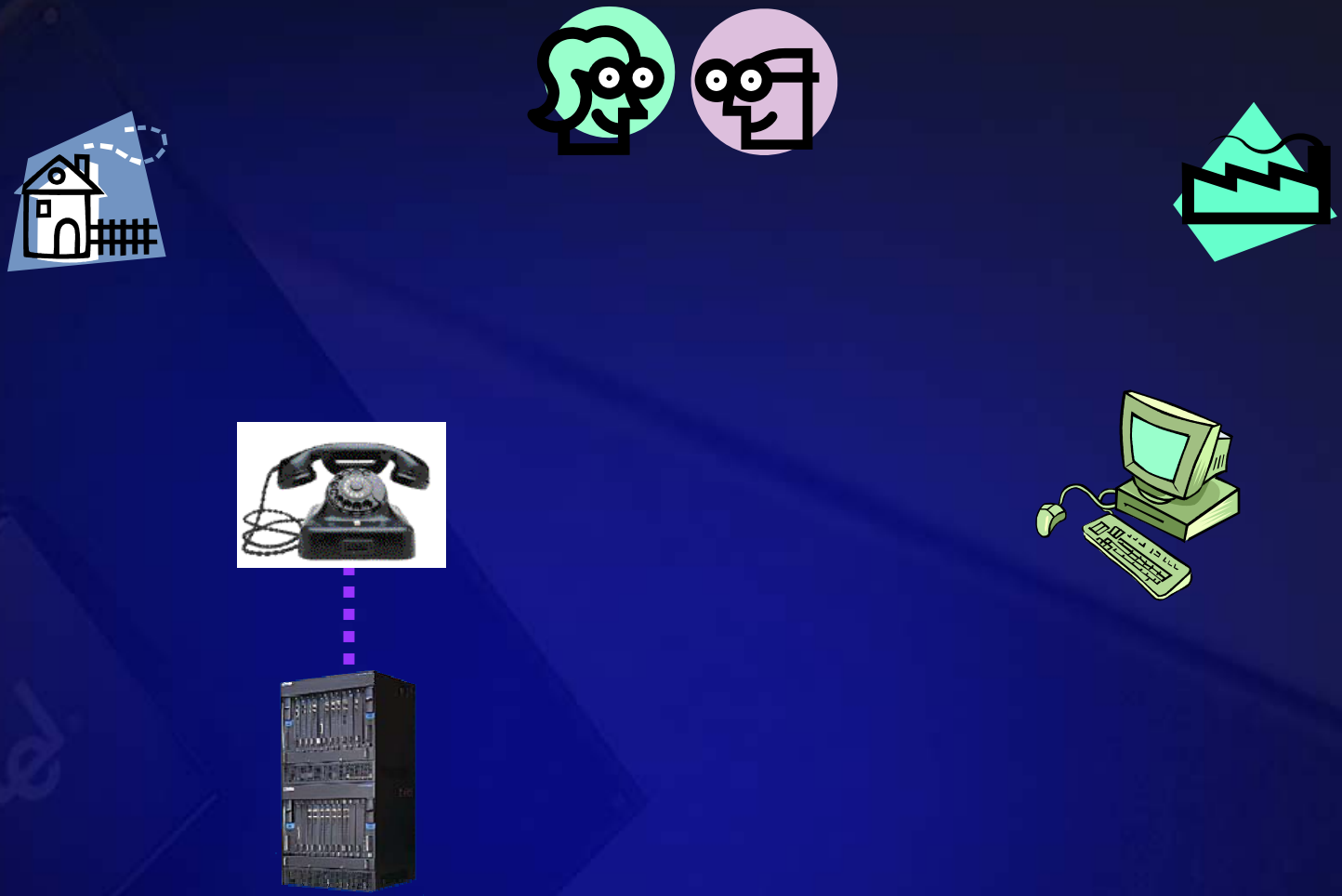
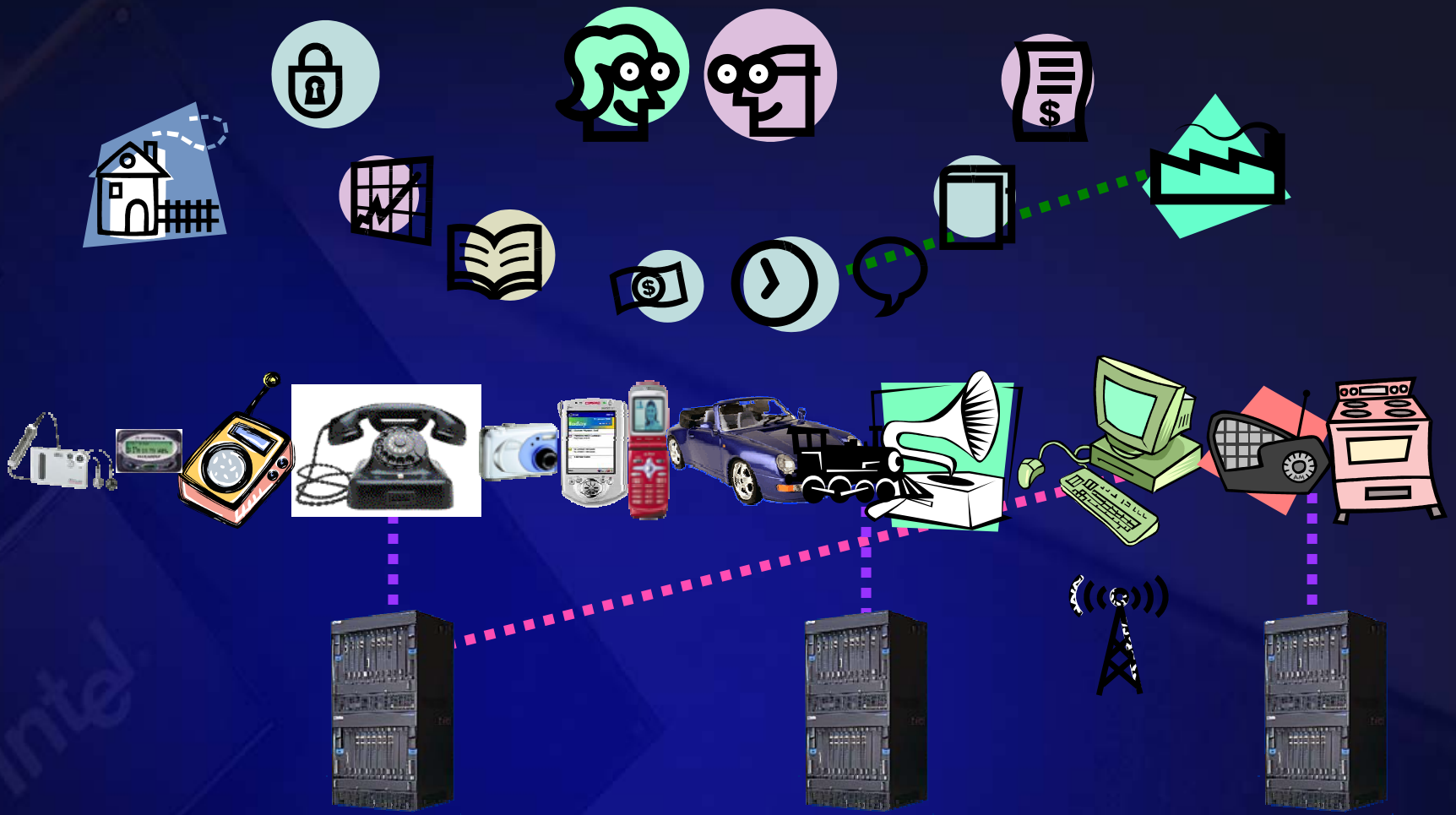
Successful User Deployments Means:
Choice, Confidence, Flexibility

Walt Brown – walt.brown@intel.com
Intel Communications Infrastructure Group
NGN@Home, ETSI, Sophia, April 2005

Same Old Computer and Phone in the Same Old Places



All These New Gadgets and Paradigms!



And in Lots of New Places!

And So Many New Providers!

Von Feb05

Lots of New Services!

"OnStar*"

Directions

Read a Magazine

Get Help

Push to Talk

Have a Meeting

Get the News

Get Cool Ringtones

Buy Tickets

Surf the Web

Talk to the Kids

Check a Schedule

Instant Message

E-Mail

Call Fire Truck

Get Medicine

Translate

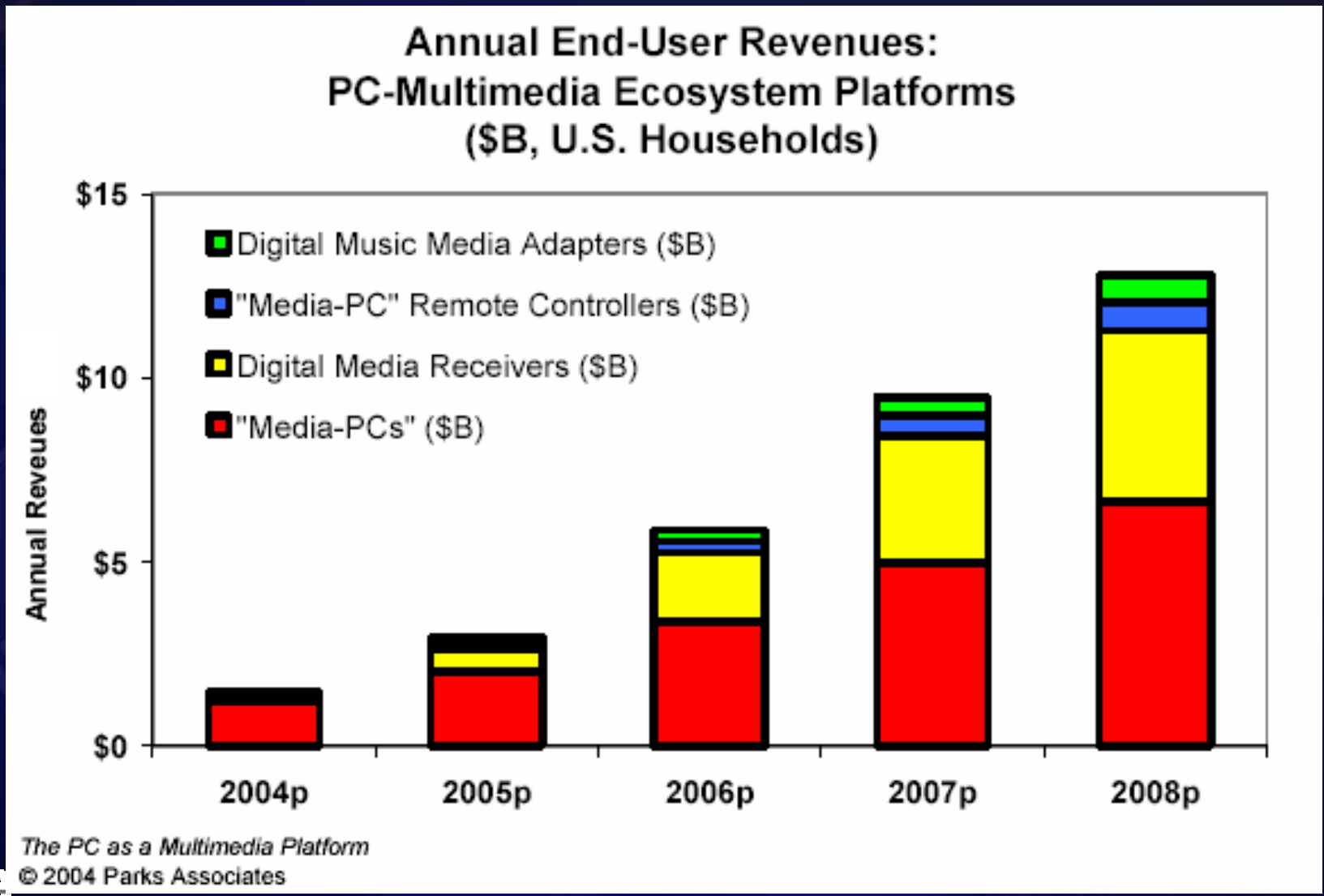
Erkki Liikanen

- Former European Commissioner responsible for Enterprise and Information Society

"We should aim for all citizens to be able to use electronic communications, whether they have less digital skills, are living in remote regions, have less income, or have special physical or mental needs. Everyone should share the benefits of the Information Society in terms of access to services and of greater choice, lower prices and higher quality."

ESO Conference, 2003

Digital Home Product Sales Projections



The PC as a Multimedia Platform
© 2004 Parks Associates

Connected Products

Linksys Digital Media Station

Philips Digital Media Receiver

HP Digital Media Receiver

Wireless – B Media link For music WML11B

D-Link DSM-320

iCube Play@TV

Sony RoomLink

Apex Networked DVD

TiVo Home Media Option

GoVideo D2730 Networked DVD

Sound Blaster Wireless Music

Gateway with Wireless 802.11b DVD

Rockford OmniFi

Netgear MP101

Roku HD 1000

SMC Universal Wireless Multimedia

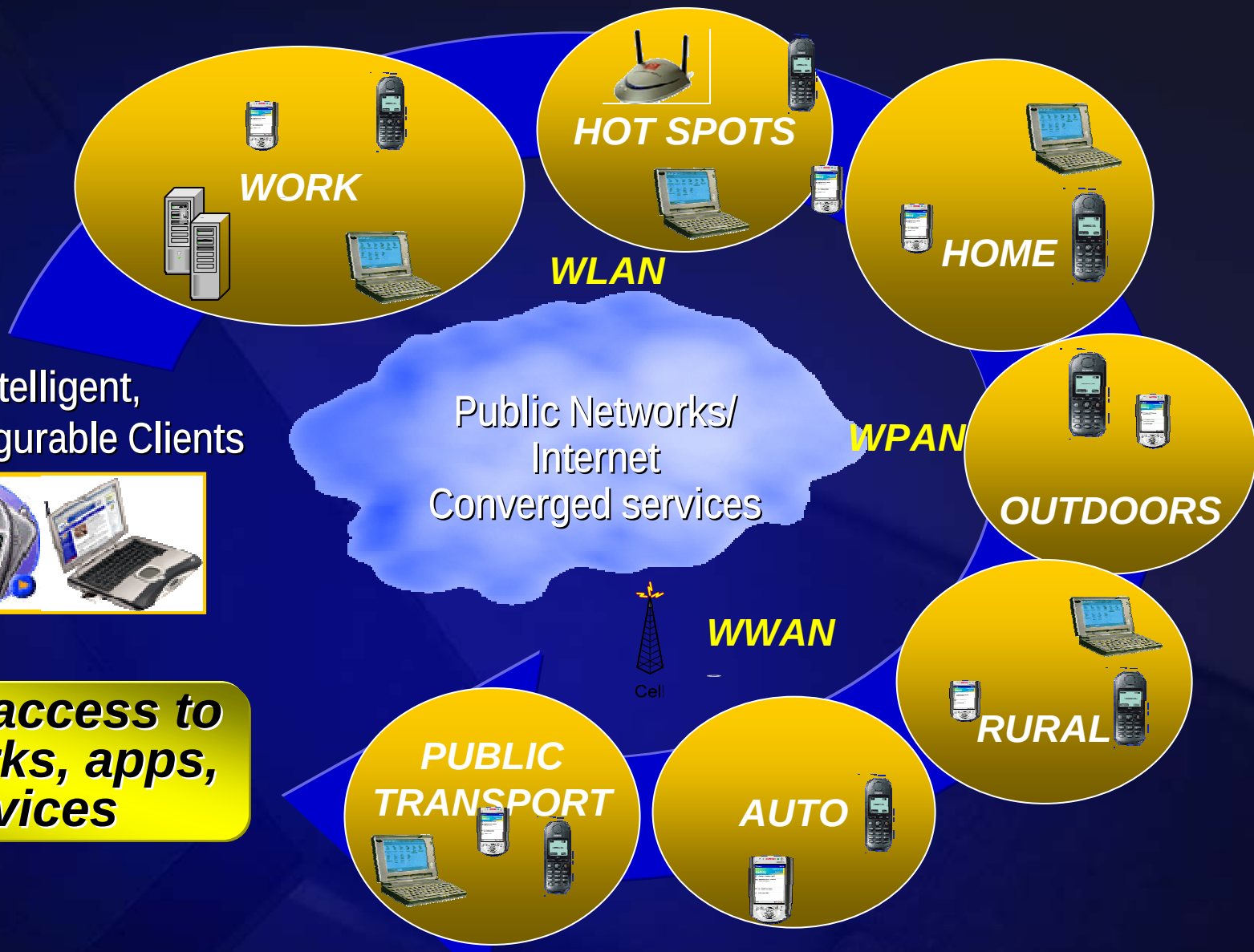
Hauppauge

PrismIQ Player

GlooLabs HomePod

Pinnacle Show Center

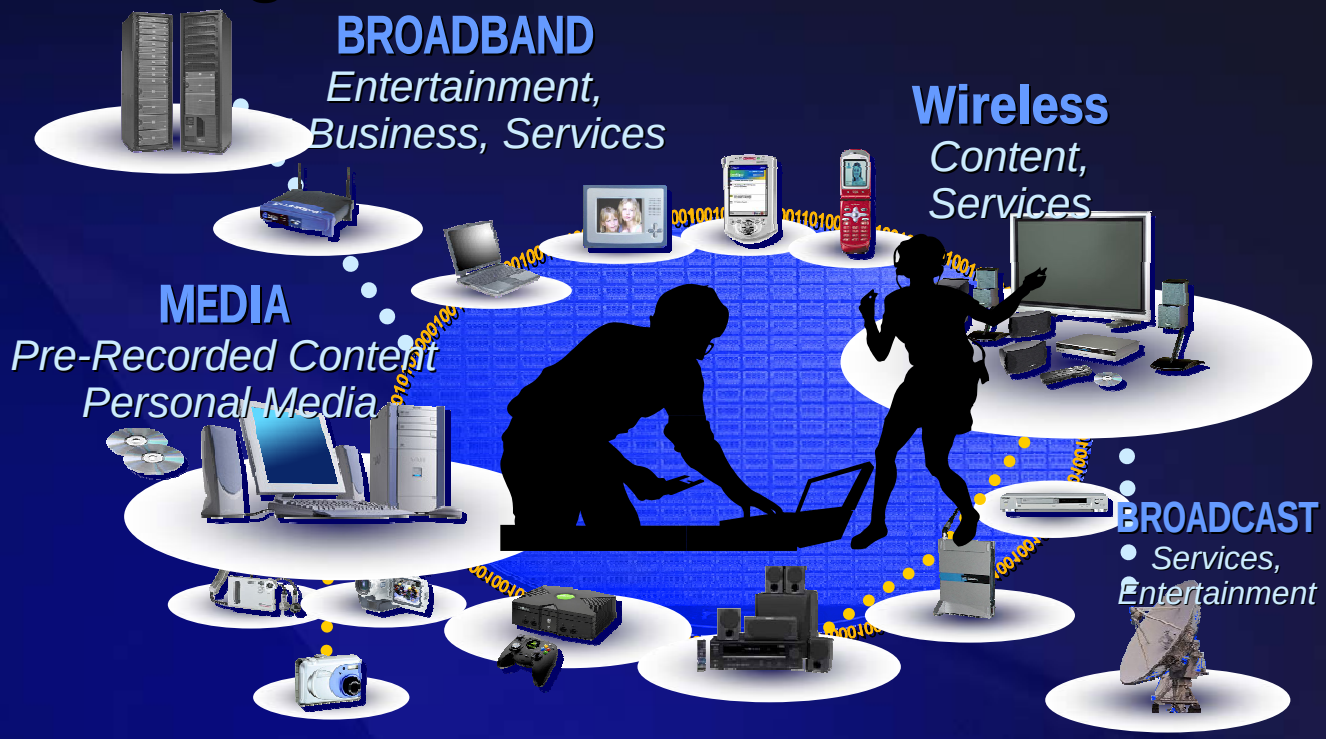
Mobility & Wireless Vision



Intelligent,
Reconfigurable Clients

Seamless access to all networks, apps, & services

Digital Home is a content manager built around me



Goal	**Delivering Personalized Content to any device, mobile or in the home**
Intel Perspective	**Powerful client devices drive xSP growth through new data services ’04-’08**
Deployment Plan	**Mainstream users in all geographies; the digital evolution continues with mobility, personalization and interoperability**
Scope	**Affordable media platforms for personal environment, mobile, home, office**

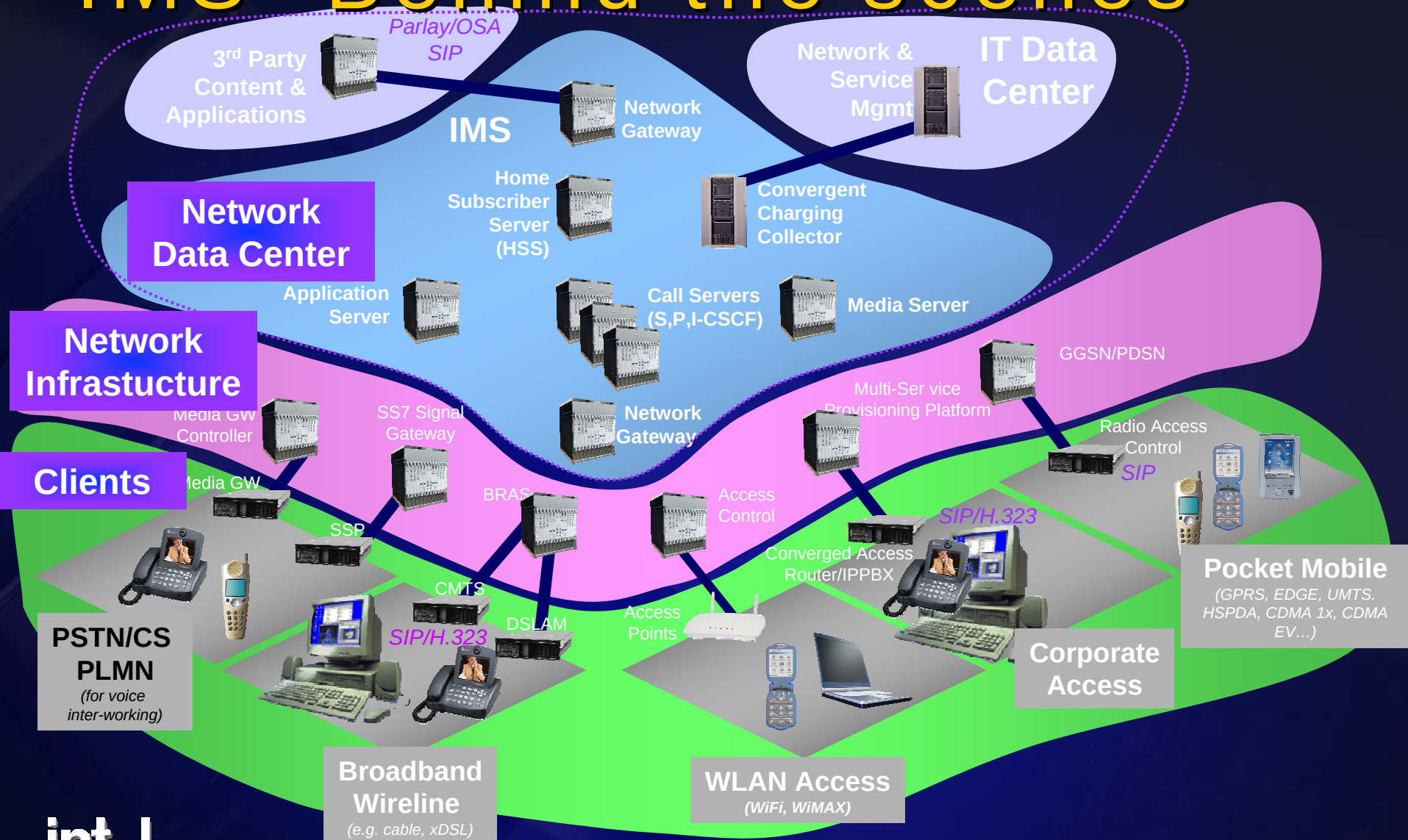
What Do People Do?

- Talk to each other
- Discover
- Look for easier ways to do things
- Play
- Work
- Study
- Move around
- Keep track of things
- Buy stuff
- Eat
- Sleep
- Get help
- Go to conferences

Change Gears

- “Pay no attention to that man behind the curtain!”
- IMS Support

IMS "Behind the scenes"



What is IMS about?

Enhanced Services
(Color Ring Back, Push to Talk, UM, UComms, Presence, Video, …)

IP Only Interface w/SIP

PSTN

Basic Services
(CallerID, VMail, Xfer, Conferencing)

Infrastructure
(Switching, MultiMedia, …)

Wireless

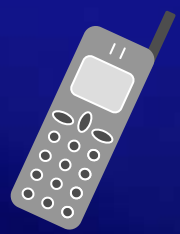
Basic Services
(CallerID, VMail, Xfer, Conferencing)

Infrastructure
(Switching, MultiMedia, …)

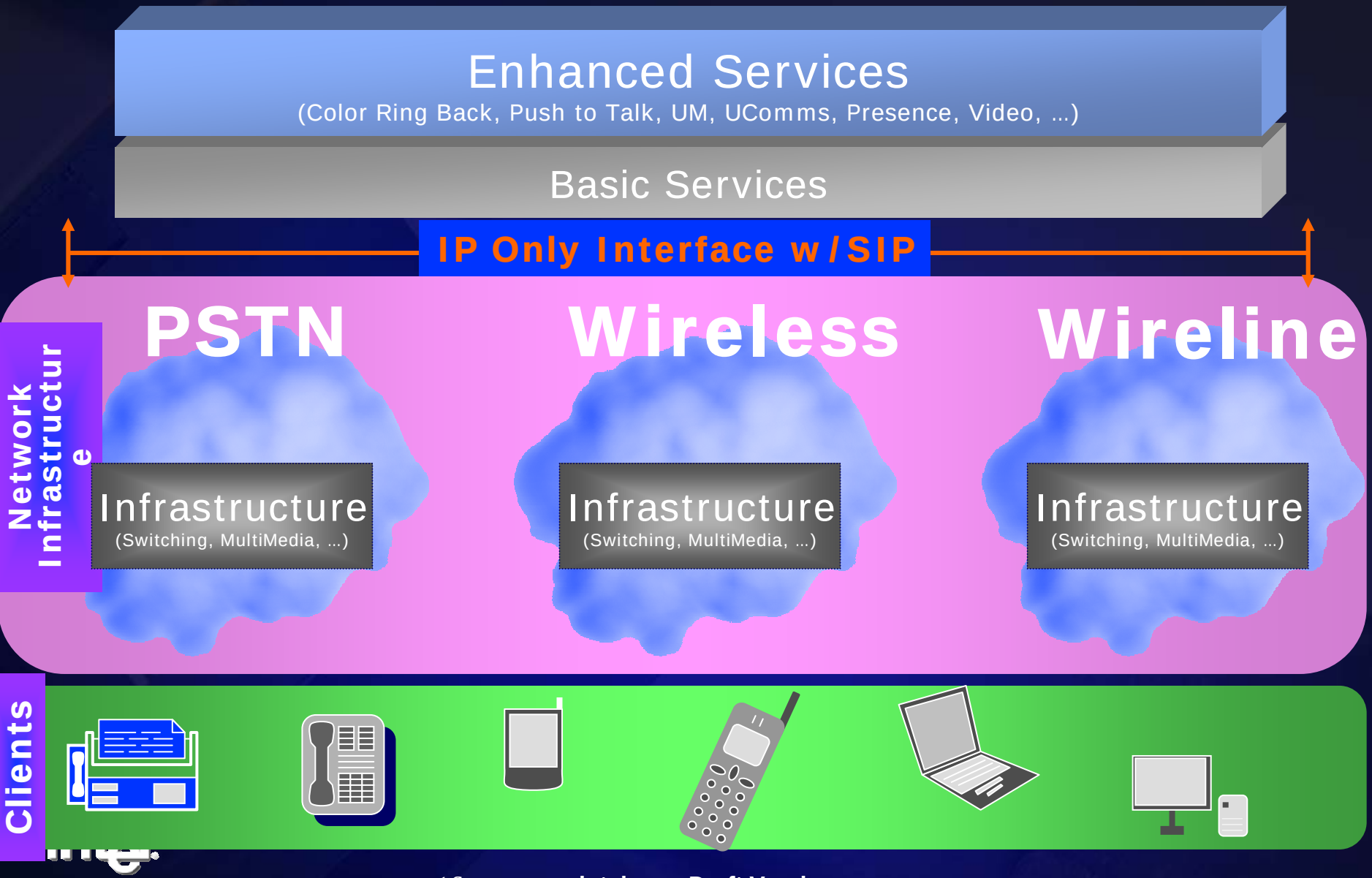
Wireline

Basic Services
(CallerID, VMail, Xfer, Conferencing)

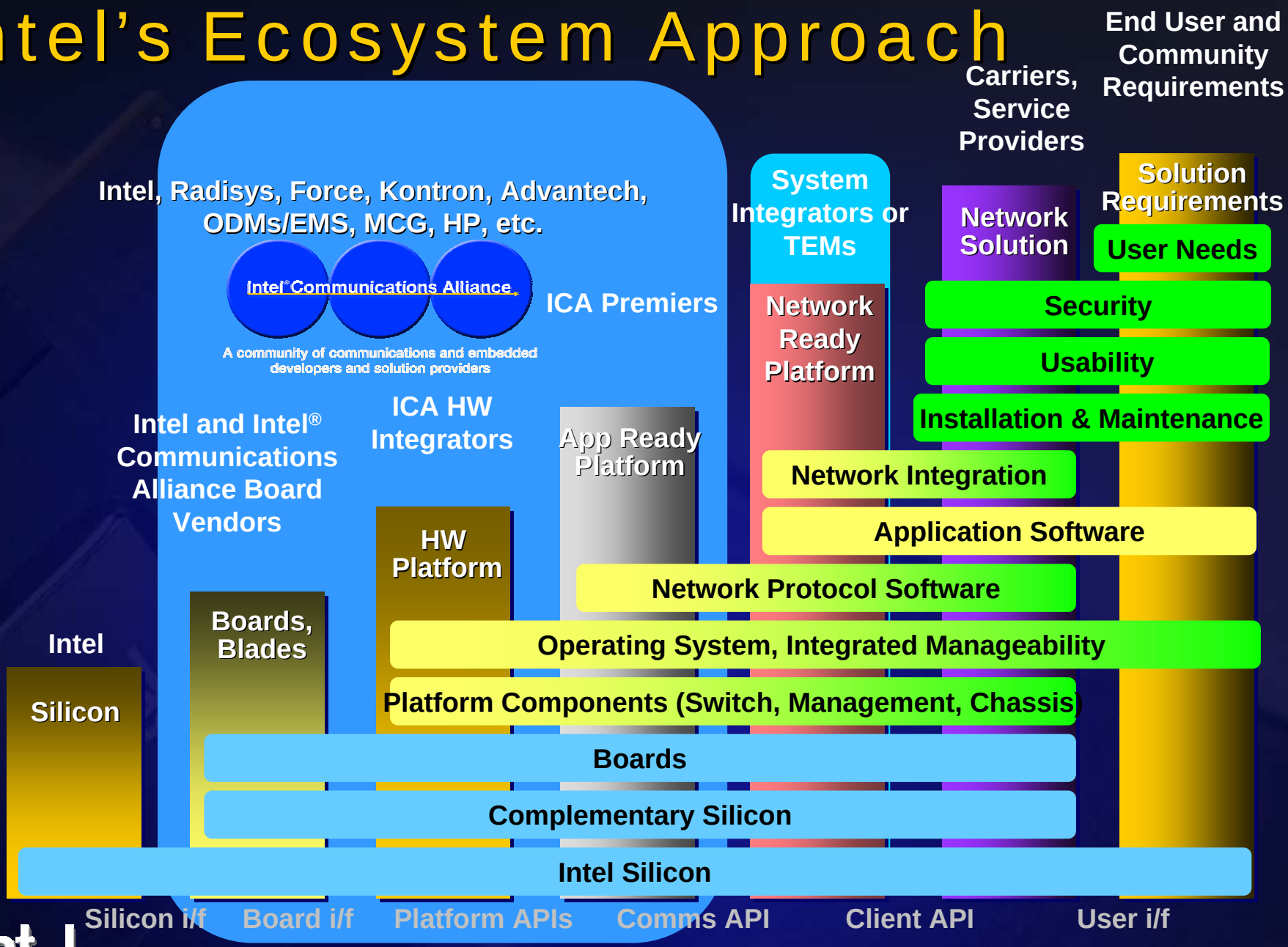
Infrastructure
(Switching, MultiMedia, …)



What is IMS about?



Intel's Ecosystem Approach



Current Activities and Beneficiaries

- International
  - ITU
  - G
- Reg
- T
  - Rel 6 and 7
  - orum
  - lliance
-
  - Many Others

- User
  - Privacy
  - Choice
  - Adaptability
  - Ease of use
- Provider
  - CapEx/OpEx
  - Time to market
  - Maximum addressable
- Manufacturer
  - Reduced development
- Government
  - Common requirements
  - Transparency
- Social
  - Community demands
  - Global applicability

What we're doing for Digital Home: Secure Content Environment

- 4C DTCP – 1394, USB, IP in progress
- 5C CPPM/CPRM – High Def DVD…
- HDCP – DVI copy protection
- AACS LA - IBM, Intel, Microsoft, Panasonic, Sony, Toshiba, The Walt Disney Company, and Warner Bros. Studios
- OMA 2.0 DRM spec
- CMLA
  - Intel, mm02, Nokia, Panasonic*, RealNetworks, Inc., Samsung and Warner Bros. Studios (Feb '03 PR)
  - Open Trust System to support OMA 2.0
  - Translate DRMs, create a standard DRM interface
- WW Legislative guidance to mediate consumer and content interests

Change Gears

- ETSI Human Factors
- STF165 – User Profile Management

Past ETSI Human Factors Projects

- Mobility
  - Universal communications identifier to simplify making connections (STF180, 199, 200), Focus on elderly, young, and disabled (STF230)
- Accessibility
  - Assistive technology guidelines (TR 102 068) and surveys (TR 102 279) (STF181)
  - Telecommunications for people with special needs
  - Multimodal icons and symbols for graphic interfaces (STF183)
  - Multimodal Interaction, communication and navigation (STF204)
- Communities Of Interest
  - Generic minimum vocabulary for speech interfaces (STF182) – starting with English, Spanish, French, German, Italian
  - Human factors of work in call centers (STF203)
- Technology
  - Product design guidelines for information and communications technologies
  - Generic user interfaces
  - Design for all (STF184)

Current HF Projects

- Mobility
  - Generic mobile user interface elements (STF231)
  - Mobile e-services
  - Mobile office usability
  - Portable devices and user education
- Accessibility
  - Distributed universal speech and text (STF267)
  - Video and ICT symbols
  - Language issues in broadband
  - Setup procedures for first time users
- Communities of interest
  - Telecare in intelligent homes (STF264)
  - **User profile management (STF265)**
  - ICT and young people (STF266, 201)
- Technology
  - Supplementary service identification
  - HF bibliographic survey

What is a User Profile?

User and context information used to deliver:

appropriate services and content, in a format tailor-made to users' needs.

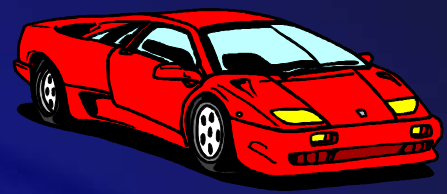
Profiles contain data describing:

- The user's preferences including
  - characteristics
  - abilities
  - needs.
- Settings, rules and state changes related to
  - User Profile Management system
  - services
  - terminals
  - communications.

Example – Multimodality Special need - listen to text

- A blind person or a child who cannot yet read might prefer listening to text.

- A person driving a car might prefer listening to text.



The permanent profile

”Listen to Text”/“Blind” provides this service.

COST219ter and ePerSpace Scenarios

Bill, 24 years old has a severe hearing loss

- Bill uses a mobile video phone to communicate in sign language via a relay service to book an appointment with the dentist.
- Bill uses an automated system which recognises his sign language and converts to speech in a choice of languages.

Issues related to homes/buildings

- Several persons in the same home with conflicting preferences.
- Guest profiles?
- How to reuse profile settings
  - profiles/settings when
    - buying new devices
    - moving
  - Standardization of settings digital homes.
  - If I move, can I use my profiles and will the new house understand my preferences?
- Use devices in home for automatic activation of user profiles.
  - Example: Open gate activating “Home” profile.
- Will the house have different profiles?
- How will the house or office profiles and user profiles interact?
- Examples:
  - Last person leaving the house would turn off the heating and turn on the alarm.
  - Activating In_Car profile (after the At_Work)

Future HF Projects

- Mobility
  - Mobile internet access and e-services
  - Ad-hoc networks
  - Public access points
  - ICT in transportation
  - Real-time user to user multimedia communications
- Accessibility
  - AT commands for assistive devices
  - Harmonized relay services
  - Access symbols for digital TV
  - Interactive multimedia interfaces for blind users
- Communities of Interest
  - Enterprise applications involving communications
  - Services and usability testing for children's ICT use
  - User experience interoperability
  - Language flexible keyboard characters
  - Telecare, and ICT in healthcare
- Technology
  - Assistive predictive text
  - Spoken command languages

Change Gears Again

- Intel Organization
- Intel Technologies

New Intel Organization

Mobility Group

Sean Maloney
Dadi Perlmutter

Platforms for:

- Notebook PCs
- Handheld Computing
- Mobile Comms devices

Digital Enterprise Group

Pat Gelsinger
Abhi Talwalkar

Platforms for :

- Computing
- Servers
- Communications Infrastructure

Digital Home Group

Don McDonald

Platforms for Digital Home

- Living Room Entertainment
- Consumer electronics

Digital Health Group

Louis Burns

- Healthcare Research
- Diagnostics
- Productivity
- Personal Healthcare

Channel Prod Group

Bill Siu

- Products to meet unique needs of local markets Worldwide

Organizational Focus on Developing Complete Technology Platforms

From Chips To Services

Silicon

Boards, Chassis, Software, Services

HW Platform

System Platform

Complete System Product

Solution

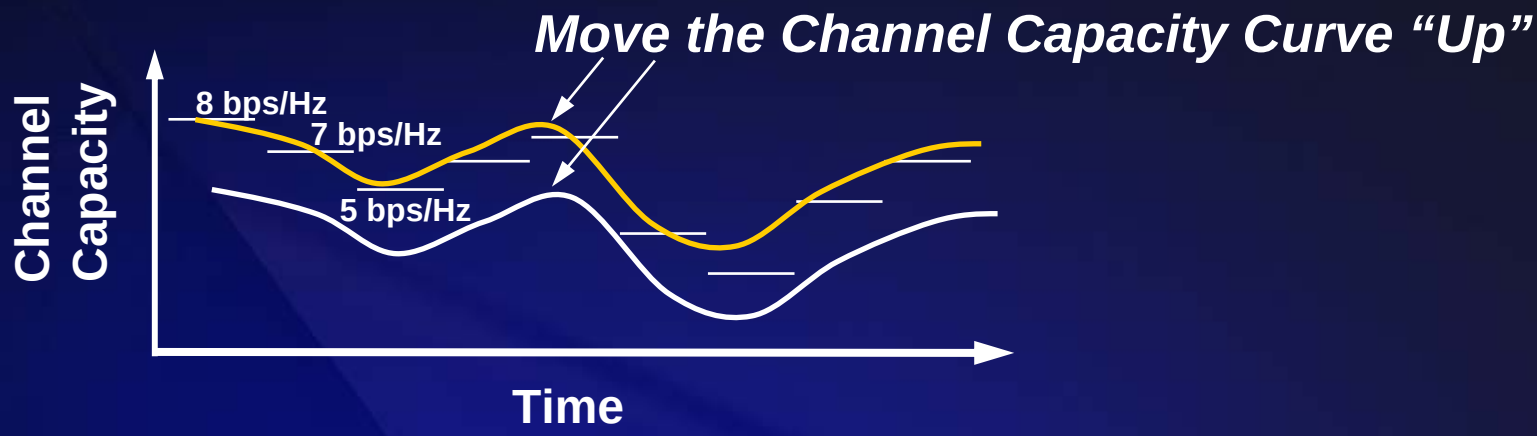
Network Solution

User Solution

Unique value-adding activities of each supplier

Common non-value-adding activities all have to do

Smart Antennas



Short-term architectures to *increase range*

- Sectored antennas – directional antennas
- Analog combining of multiple antennas

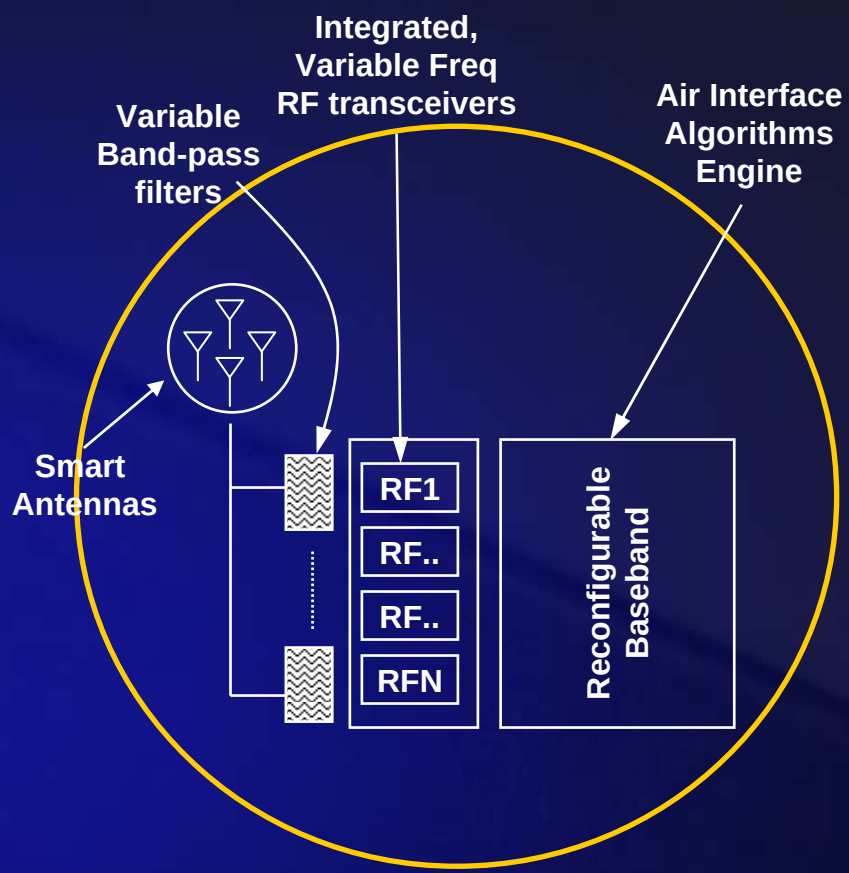
Long-term architectures to *improve throughput*

- SDMA – Spatial Division Multiple Access (increase users)
- MIMO – Multi Input Multi Output (increase data rate)

Improving Radio Range, Capacity, and Data Rates

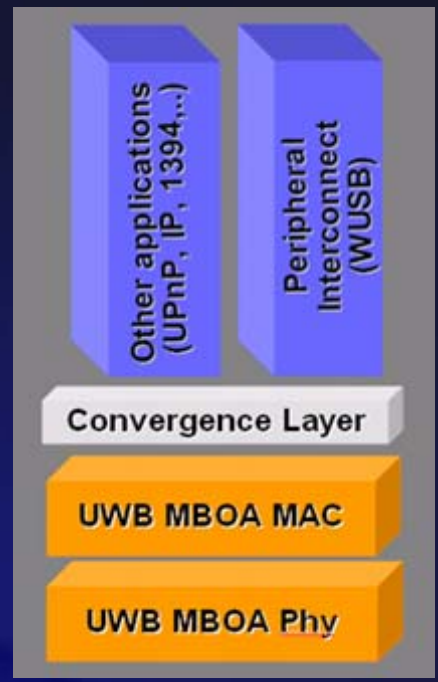
Intel CMOS RF Development

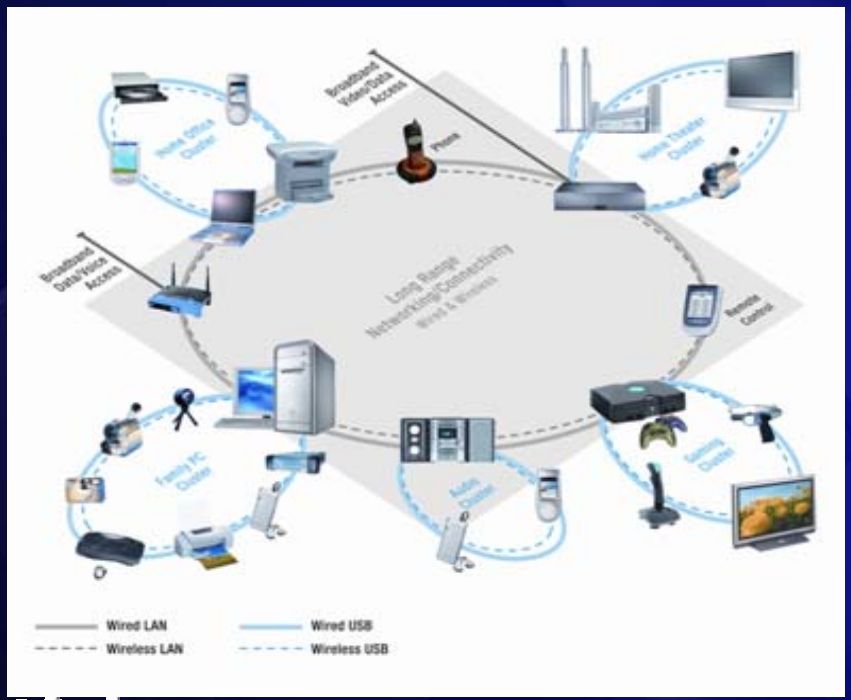
- ***Circuit solutions for WPAN / WLAN / WWAN*** **with compute sensitive CMOS for increasing data rates and Low cost integration for multi band operability**
- ***Cognitive Radio*** **for optimal operation based on geography, spectrum conditions, and application requirements**
- ***RCA (Reconfigurable Architecture)*** **for supporting multi Base Bands through a flexible array of heterogeneous processing elements optimized for baseband processing and configurable for various radio schemes**



Wireless USB

- First high-speed personal wireless interconnect
- Based on MB-OFDM UWB Radio from MBOA and WiMEDIA convergence layer
- Launching at 480 Mbps, 127 connected peripherals, hub-and-spoke topology
- Complements 802.11 for devices in cluster communication around Intelligent Centers





- Maintain USB model of cheap, simple devices
- Symmetric association, security, and ease-of-use
- Wireless USB specification in Q4
- Usage models for CE, PC, Mobile

Physics

Making It Personal

Machine Learning

Distributed Systems

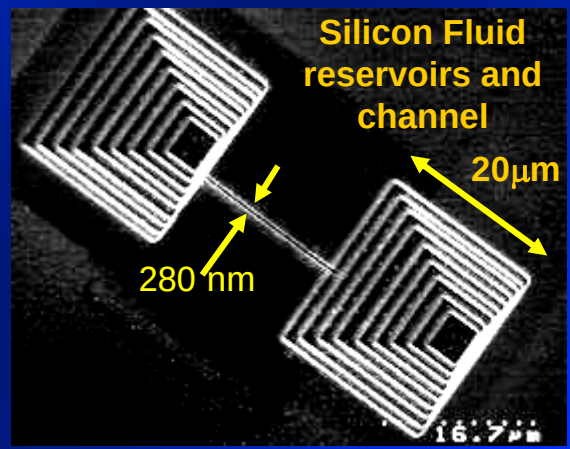
Ubiquitous Computing

Physics

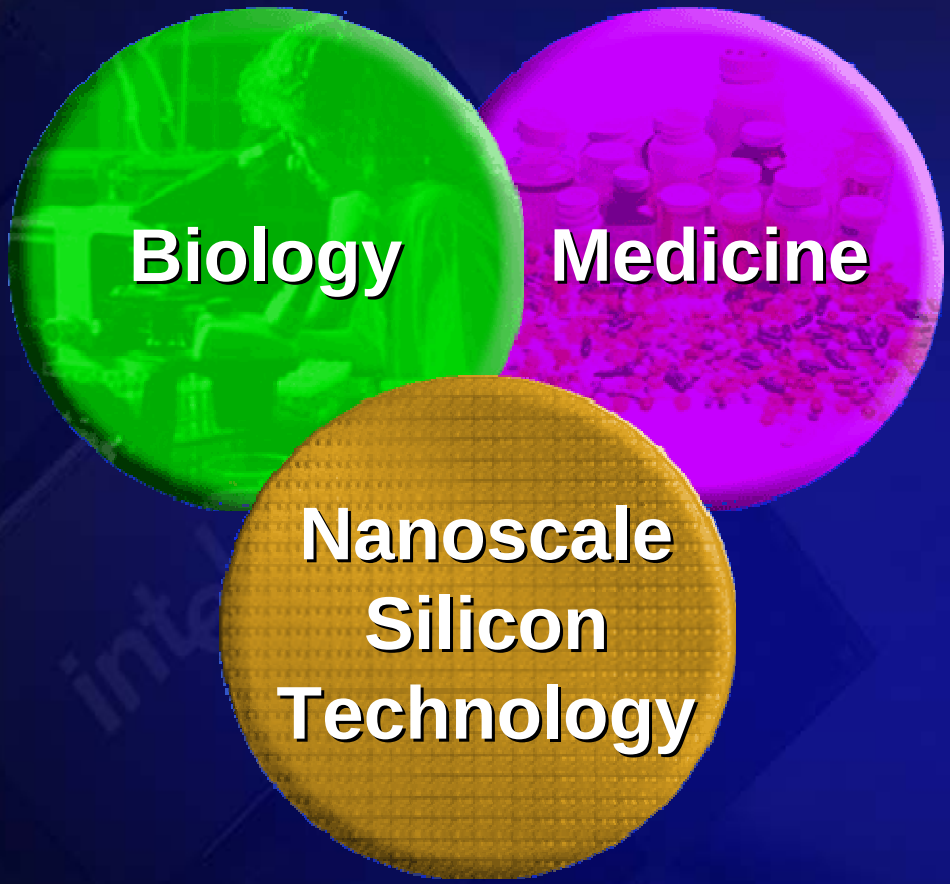
Other Examples:
- EUVL Masks
- Advanced Metrologies for Packaging
- Computational Nano-Vision

Precision Biology

Create a new generation of bio-instruments capable of operating in the *single-molecule* regime

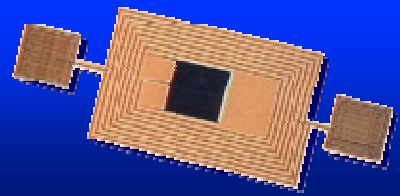


Micro-fluidics and Silicon Biology



Disease Research

DNA Analysis



Smart Bandages

Early Disease Detection

Health Monitoring

Distributed Systems

Making It Personal

Machine Learning

Distributed Systems

Ubiquitous Computing

Physics

Other Examples:
- Open Research Compiler
- Open Runtime Platform
- Personal Server
- Robotics
- Diamond-massively parallel disk interactive search

Planet Lab

Global, open test-bed with 65 sites and 160 researchers enhancing distributed Internet services

Ubiquitous Computing

Making It Personal

Machine Learning

Distributed Systems

Ubiquitous Computing

Physics

OtherExamples:
- Location Aware Computing
- RF MEMS
- Internet Suspend/Resume (seamless mobility)
- IrisNet-Internet scale sensor networking

Multi-hop Sensor Networks

Next Generation Sensor Network Building Block-Intel Mote

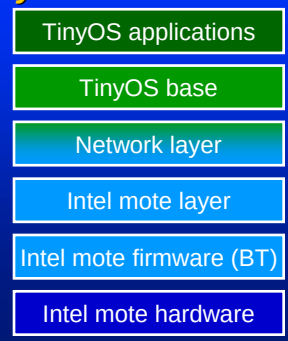
- Ultra low power operation
- System level integration
- Power / performance efficient HW reconfiguration

Hardware & Software

Modular platform

- Sensor board(s)
- Main board
  - CPU, radio, memory
- Battery board

TinyOS software stack



Sensor Networks

Process Monitoring And Control

Firefighting And Rescue

TinyOS TinyDb

Sensor Prototype

Agriculture

Environmental Monitoring

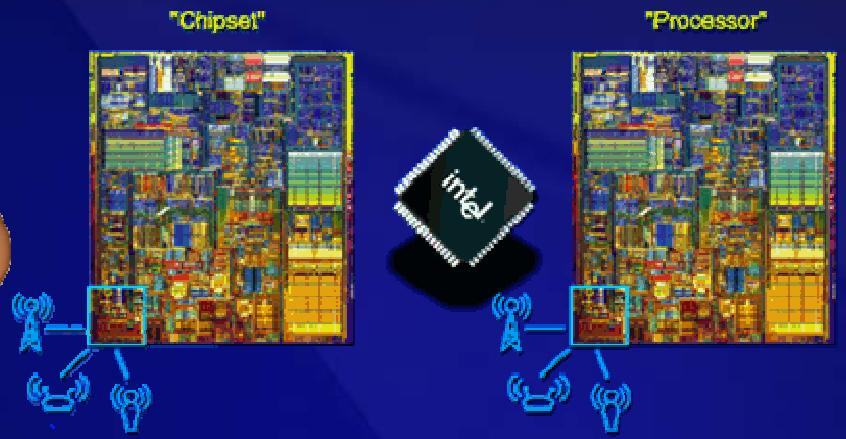
Structure And Earthquake Monitoring

Making distributed intelligence happen

Radio Free Intel®

MEMS

Seamless Roaming



Dynamically Reconfigurable

Silicon Radio

the Vision

Regulatory Policy

Smart Antenna Systems

Seamless Networking

- **Create an end-to-end architecture that fulfills the customer experience for seamless and simple wireless connectivity**
  - **Platform integration of advanced Intel wireless comm technologies**
  - **Identify and develop ecosystem of fellow travelers to complement Intel products**

802.11

Wired LAN

2.5G/3G

Embedded Security Technology

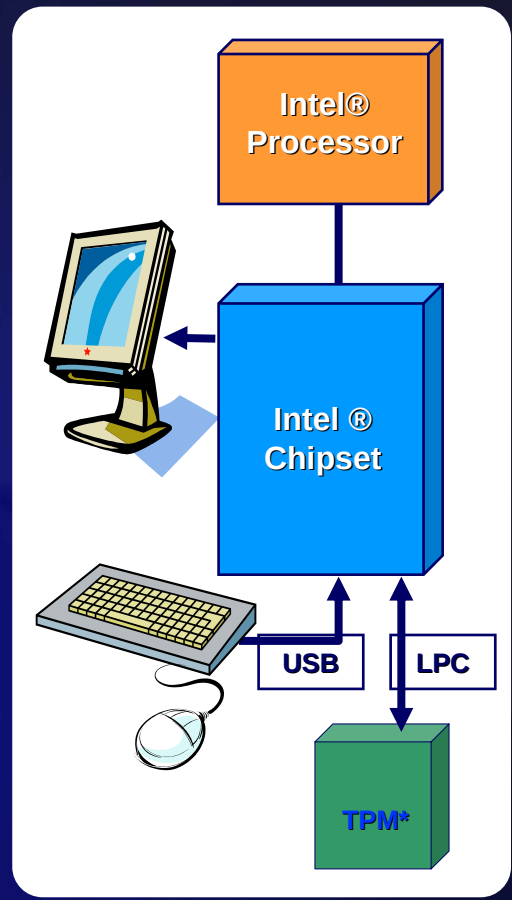
Benefits:

- **Protects sensitive information from software-based attacks without compromising usability**
- **Creates a hardware foundation that helps protect data from software-based attacks**
  - Protected Execution
  - Protected keyboard and mouse input
  - Protected Graphics
  - Enhanced Sealed Storage

Intel R&D Efforts:

- **Versatile set of hardware enhancements to Intel processors, chipsets, and platform**
- **Desktop & Mobile platforms in the next 2+ years**

Hardware Components



Ultra-Wideband (UWB)

First High-speed Wireless Personal Area Network

Benefits:

- MultiBand OFDM technology
- Very high data rates
- "Underlay" technology
- Peaceful co-existance
- All CMOS, low power, low cost

Intel R&D Efforts:

- System Research & HW Prototyping
- Circuit Design for scalable bandwidth
- Worldwide Approval & Standardization
  - FCC approval for UWB devices
  - Working in Japan, Europe and China to achieve same regulations

High-Speed WWAN (802.16e)

- **Benefits:**
  - High Speed Data/Voice
  - 2 to 11Ghz, licensed and unlicensed
  - Up to 75Mbps
  - Up to 30 Miles, non-line-of-sight
  - QOS for voice, video and differentiated service levels
  - Scalable to 1000's of users with a single basestation
- **Intel R&D Efforts:**
  - Industry leading effort to develop the next generation standards and technology for broadband wireless access
  - Broaden 802.11 system learnings to 802.16 to enable coherent client and system architectures
  - Establish a comprehensive framework to support multi-radio platforms

Making it Personal

Making It Personal

Machine Learning

Distributed Systems

Ubiquitous Computing

Physics

Other Examples:

- Speech Recognition
- Advanced Conferencing
- Senseboard
- Dialog Interfaces
- iRoom
- Proactive Agriculture
- Inside Asia

Proactive Health

Collaboration,
Real People,
Real Research

Center for Aging Services Technologies CAST

AAHSA American Association of Homes and Services for the Aging

Proactive Health

- Mission: catalyze a research ecosystem that address health needs of people in their homes
- Strategy: focus on supporting the **aging-in-place** needs of the aging "baby boomer" population

Center for Aging Services Technologies CAST

AAHSA American Association of Homes and Services for the Aging

Transforming smart home / sensor network technologies from labs to real world trials

Current Focus

Cognitive Decline

Invent systems that provide physical and cognitive assistance for aging boomers

- ✓*Needs assessment*
- ✓*Concept Prototyping*
- →*In-home Trials*
- →*Develop industry*
  - o *CAST, Alzheimers Association*

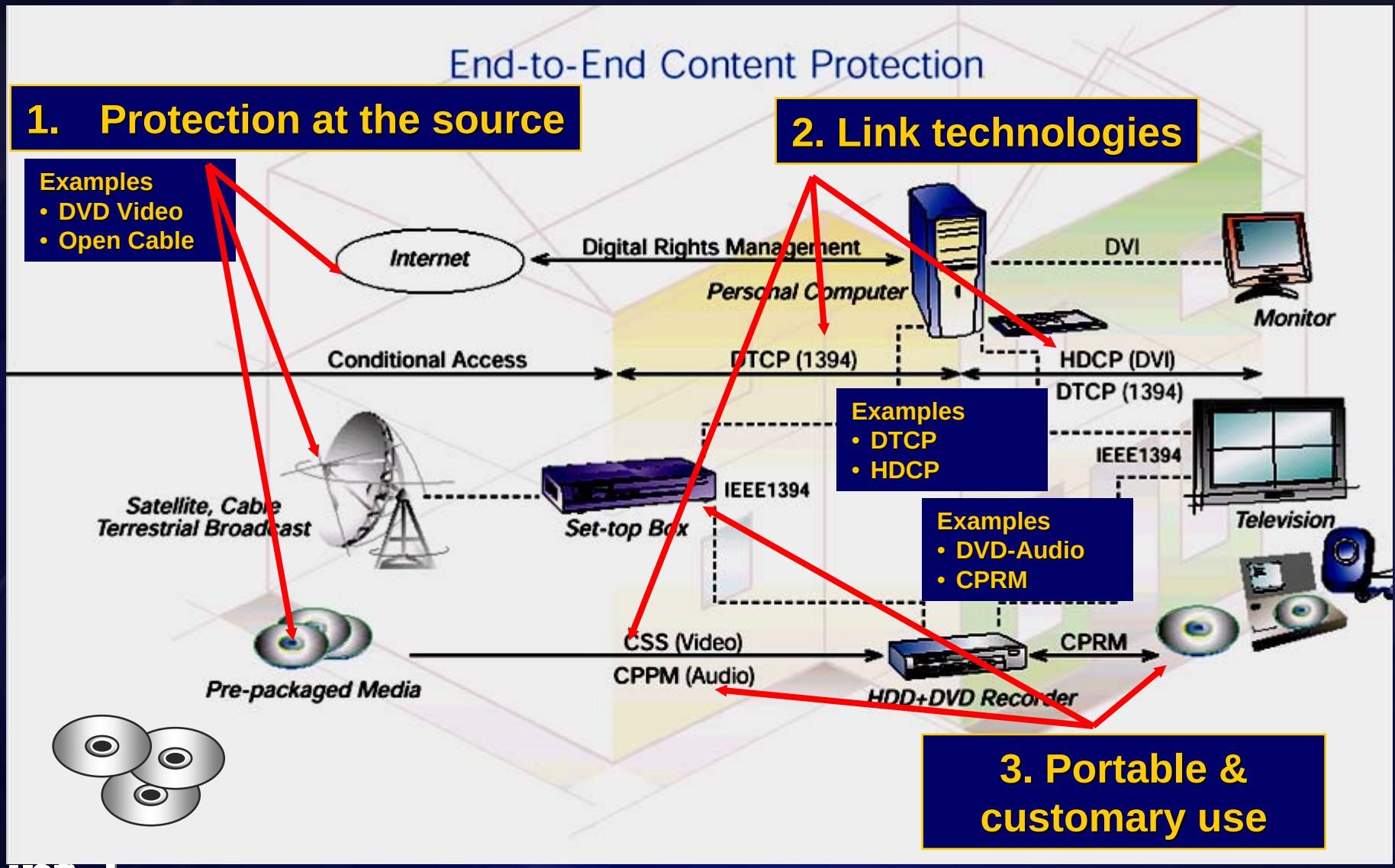
Next Focus

Chronic Disease

Design systems to aid prevention, detection, & caregiving

- →*Cardiovascular – heart attack and surgery recovery*
- →*Cancer – chronic condition management*

Content Protection



Intel® and Technology

- There are many interesting technologies, but technology does not stand alone

- Successful new technologies require:
  - Problems to solve
  - Processes to bring them to reality
  - Active commercial and user ecosystems
  - Sensitivity to global impacts and benefits

So, What Will "It" Look Like?

- It will be different than any of us can imagine!
- So prepare to be flexible.
- Support open solutions that can incrementally evolve.
- Share end user solution scenarios.
- Do not limit solution evolution with tactical restrictions.
- Allow customer mobility and choice in their bundle selection.
- Interact with competing solutions.

Thank You Very Much!

Walt Brown

walt.brown@intel.com
Network Systems Architect
Applied Telecom Solutions Center
Intel Digital Enterprise Group

For More Information……

Intel Digital Home Developers

http://www.intel.com/technology/dhdevnet/

Intel VoIP and Technologies

http://www.intel.com/go/voip/

http://www.intel.com/techtrends/

Intel® NetStructure™ Host Media Processing Software

http://www.intel.com/go/mediaprocessing

All Telecom Information

http://www.intel.com/go/telecom

Intel® Communications Alliance

http://www.intel.com/go/ICA

AdvancedTCA*

http://www.intel.com/technology/atca/index.htm

http://www.intel.com/network/csp/pdf/8822wp.htm

Compute Boards and Platforms

http://www.intel.com/design/network/products/cbp/index.htm

ETSI HF STF265 Profile Management

http://portal.etsi.org/STFs/HF/STF265.asp

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