International Telecommunication Union

IPv6 & Home Appliances
- New Trend of the Internet -
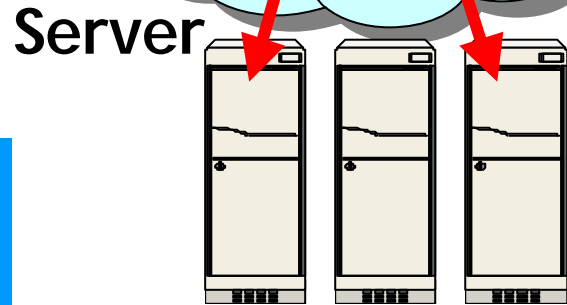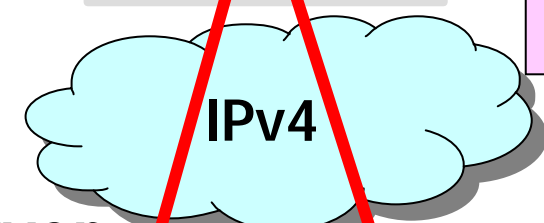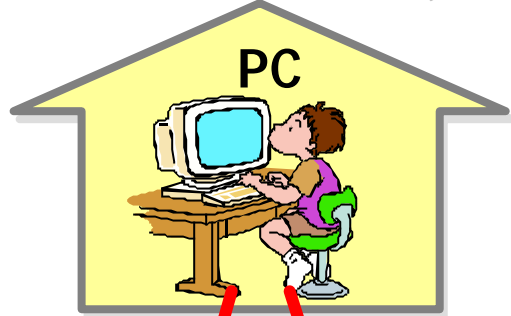
Makoto Saito

NTT Communications

Workshop on IPv6
Geneva, 22-23 June 2005
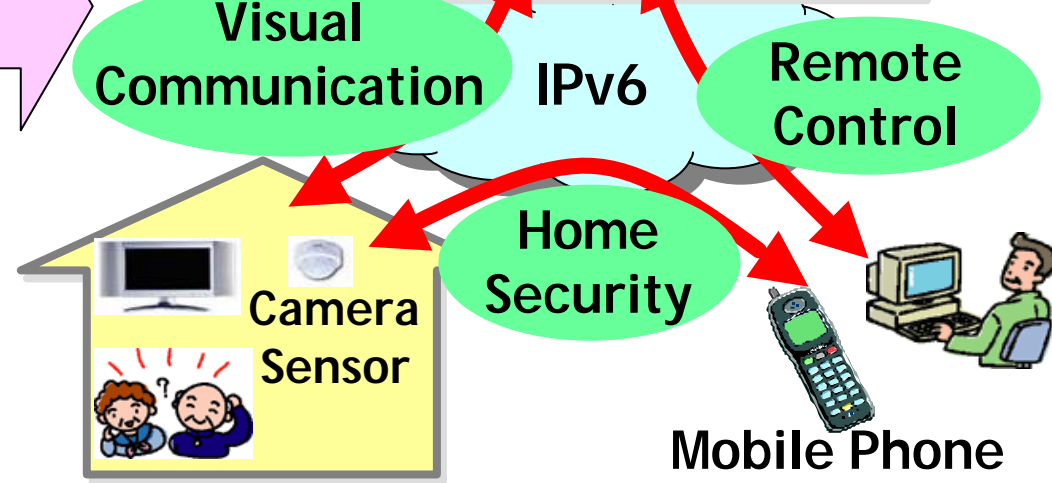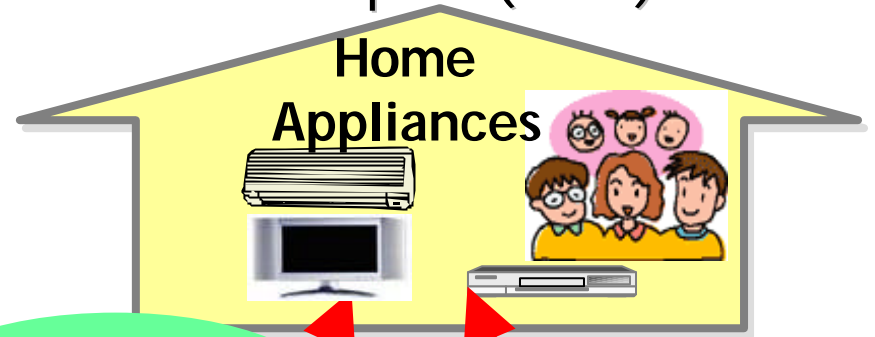
Internet and the New Trend

Conventional (IPv4)

PC

IPv4

Server

- Client-Server Model

Developed (IPv6)

Home Appliances

Visual Communication

IPv6

Remote Control

Home Security

Camera Sensor

Mobile Phone

- Bi-directional Model (M2M*)
* M2M = Machine-to-Machine
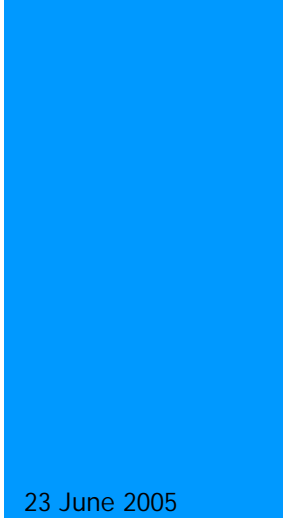
New Markets by M2M Communications

Collaboration

IC Card

Multi-Function Printer

Digital Television

Building Management

Video Recorder

Office Network

Home Network

Security

Sensor Network

Internet

Energy Management

Monitor Camera

Data Center

Mobile Network

Digital Camera

Remote Assistance

Contents

PDA

Mobile Audio
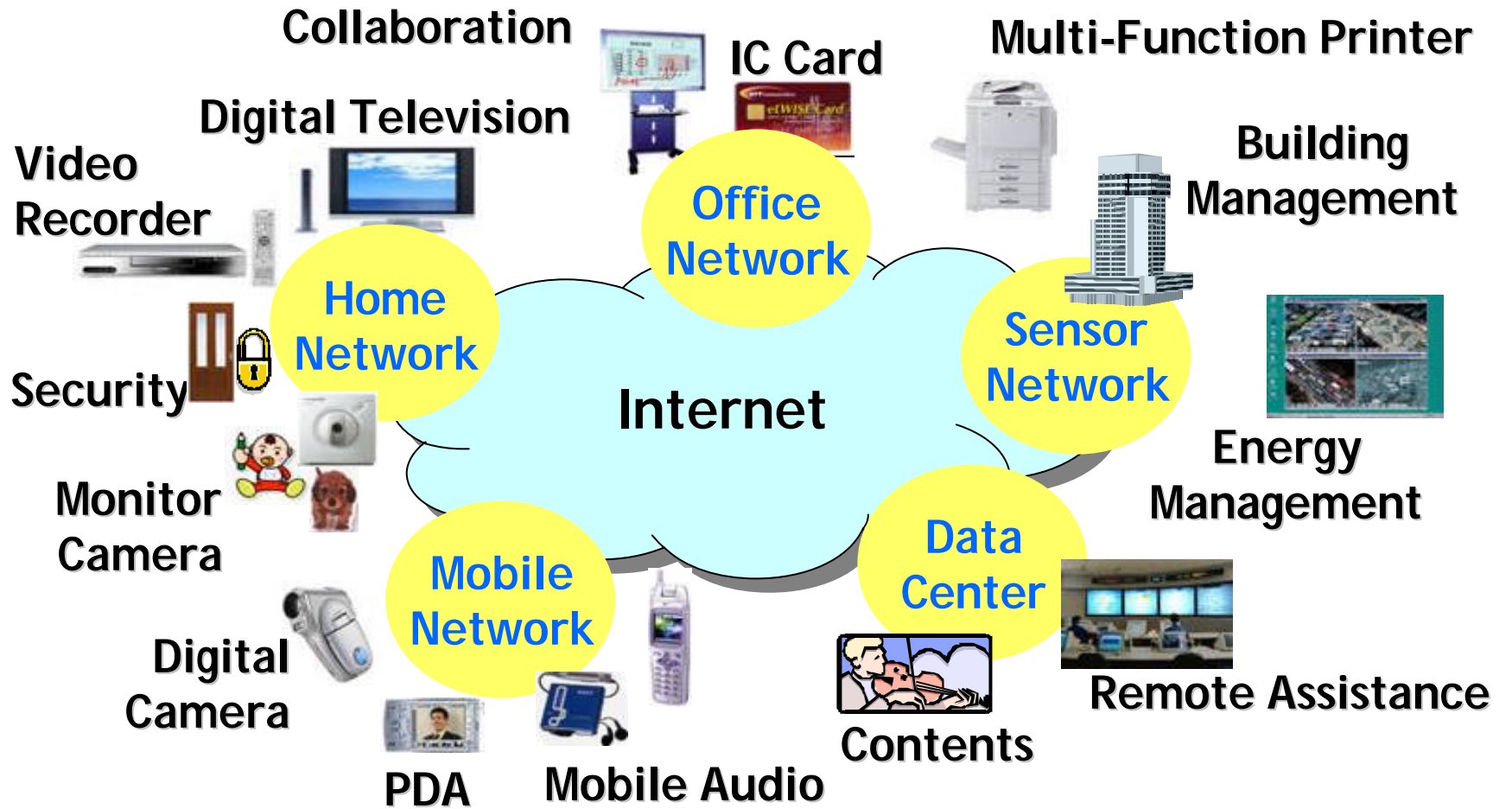
More Machines, More Applications,

More Customers, More Solution Markets

End-to-End Security

How to secure access?

Configuration and Operation

Will Users Do the Complicated Configuration & Operation?

Authentication Management

Firewall & NAT Configuration

Cryptogram Configuration

Mobile Gateway
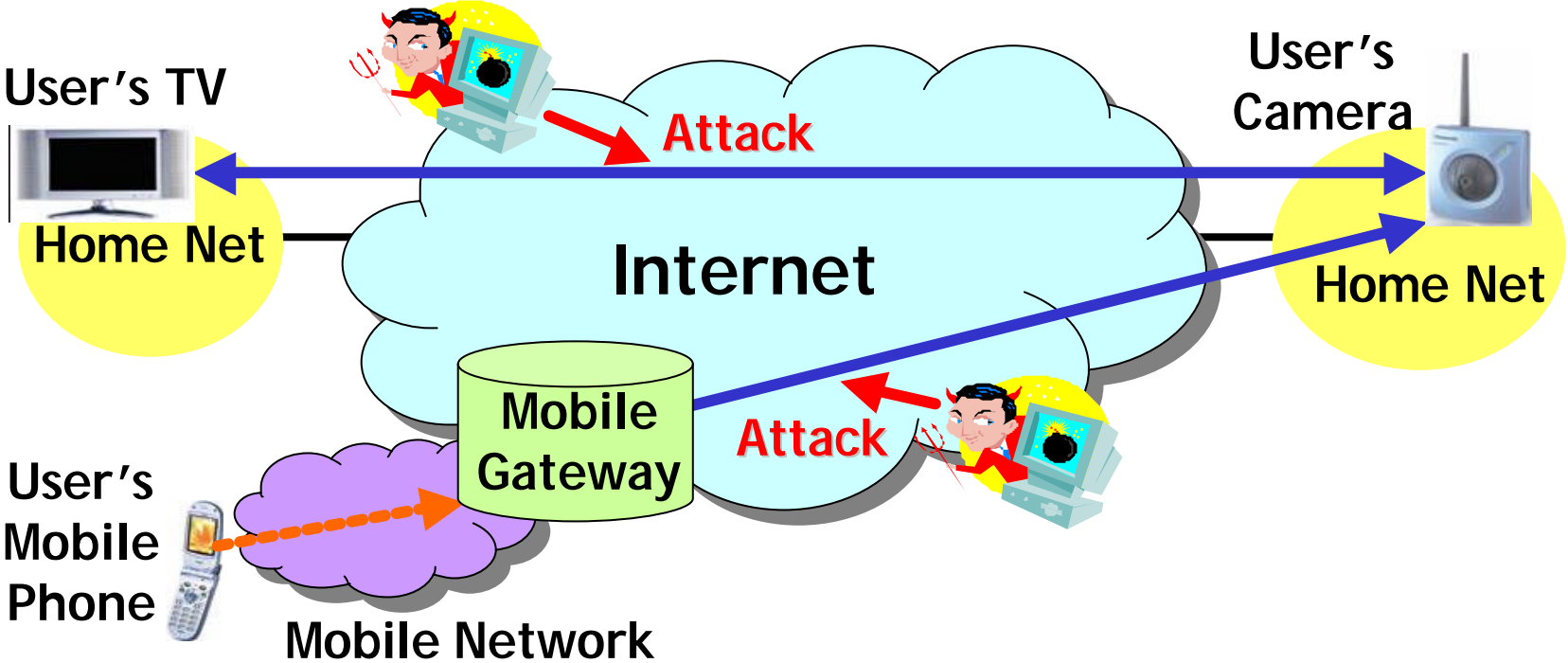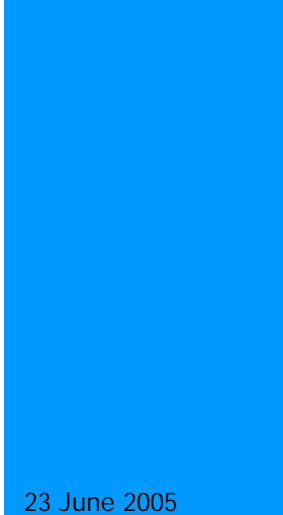
Telephone vs Internet
What is missing?

Telephone (Managed, User Friendly)

trust | **Telco A** | **trust** | **Telco B** | **trust**

signaling | **signaling** | **signaling**

Tel:03-xxx

Tel:06-xxx

Internet (Do It Yourself)

router (NAT) | **trust** | **ISP A** | **trust** | **ISP B** | **trust** | router (NAT)

signaling

connectivity only

IP: ??

connectivity only

IP: ??
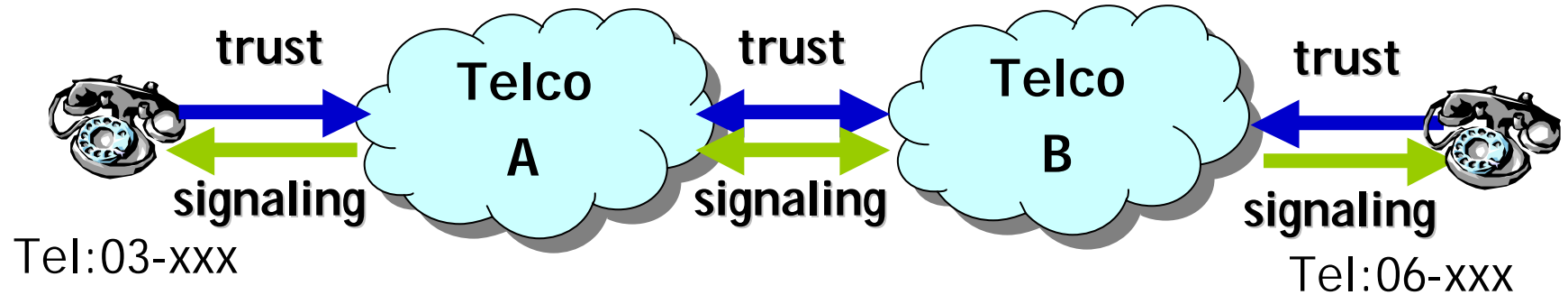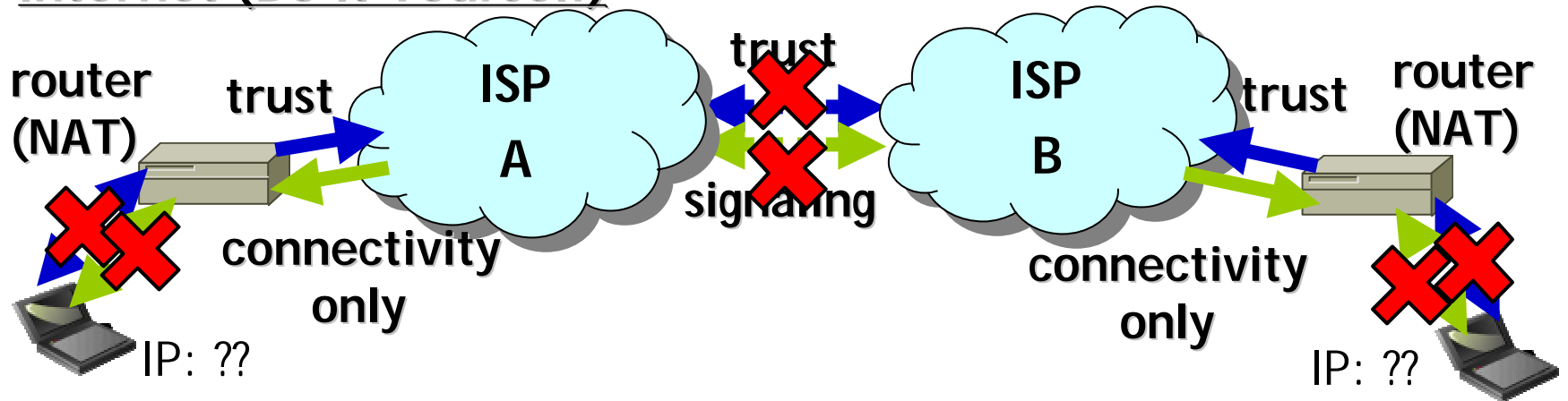
| Signaling | Terminal ID | Trust Chain |
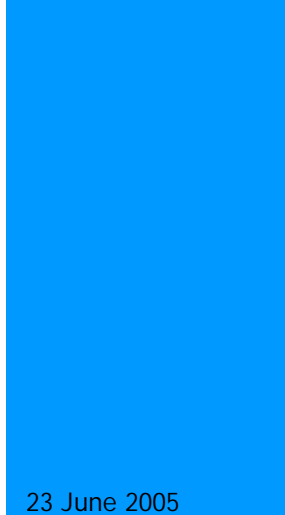
NTT-Com's Approach: Secure Communication

m2m-x

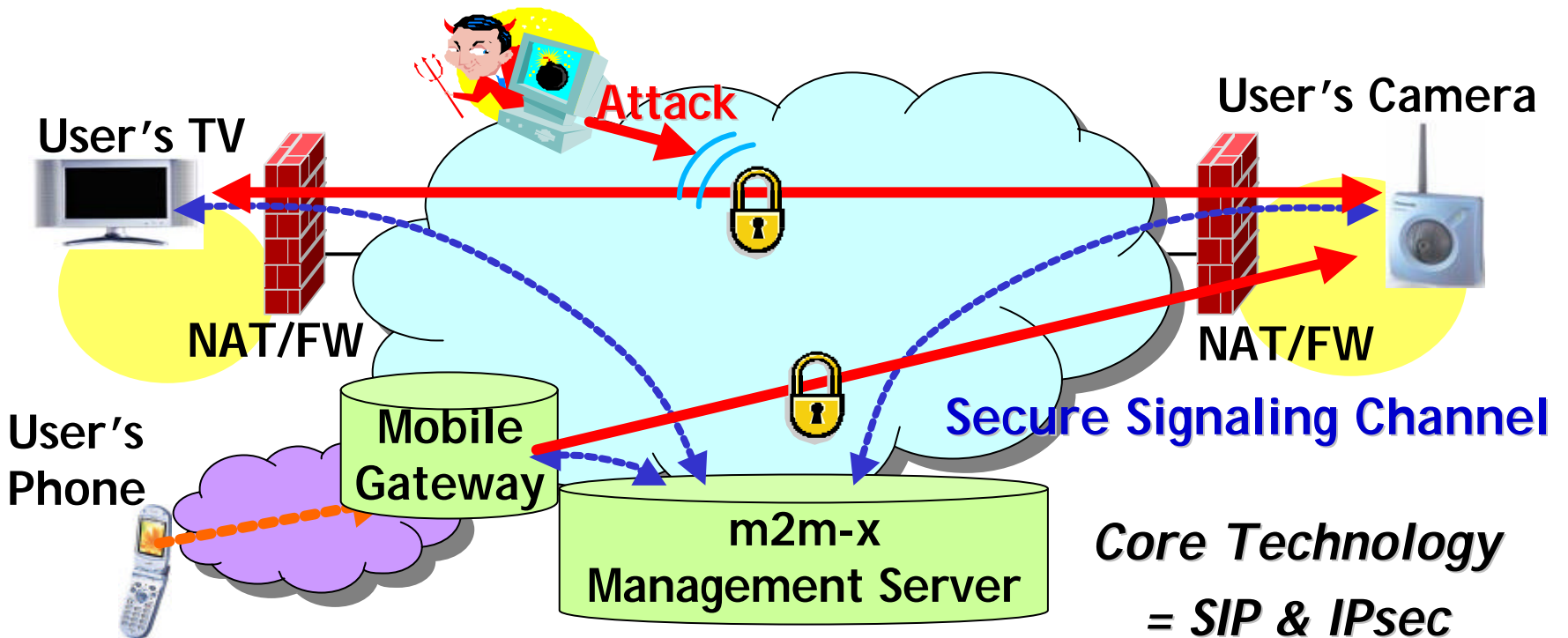**Machine-to-Machine Communication for any[thing|place|time]**

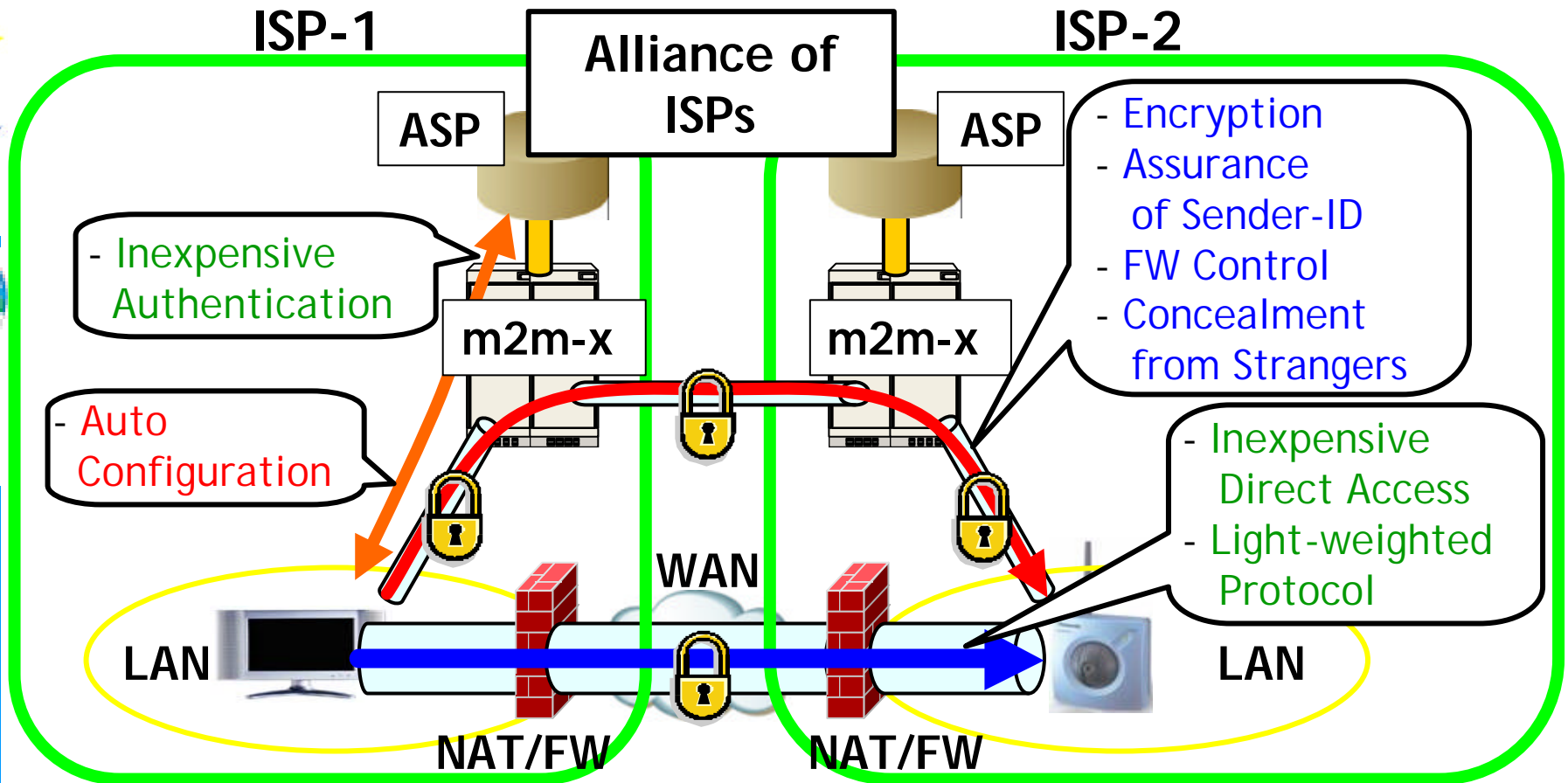| Secure | Easy | Inexpensive |

User's TV

Attack

User's Camera

NAT/FW

NAT/FW

User's Phone

Mobile Gateway

Secure Signaling Channel

m2m-x Management Server

Core Technology = SIP & IPsec

Workshop on IPv6
Geneva, 22-23 June 2005

23 June 2005

7

Features of m2m-x

Secure   Easy   Inexpensive

ISP-1   Alliance of ISPs   ISP-2

ASP   ASP

- Encryption
- Assurance of Sender-ID
- FW Control
- Concealment from Strangers

- Inexpensive Authentication

m2m-x   m2m-x

- Auto Configuration

- Inexpensive Direct Access
- Light-weighted Protocol

LAN   WAN   LAN

NAT/FW   NAT/FW

Applications Enhanced by m2m-x (1)

Dear-to-Dear Visual Communication

IPv6 & m2m-x

Personal Consulting City Government

Video on Demand

m2m-x

Access Control Authentication Encryption
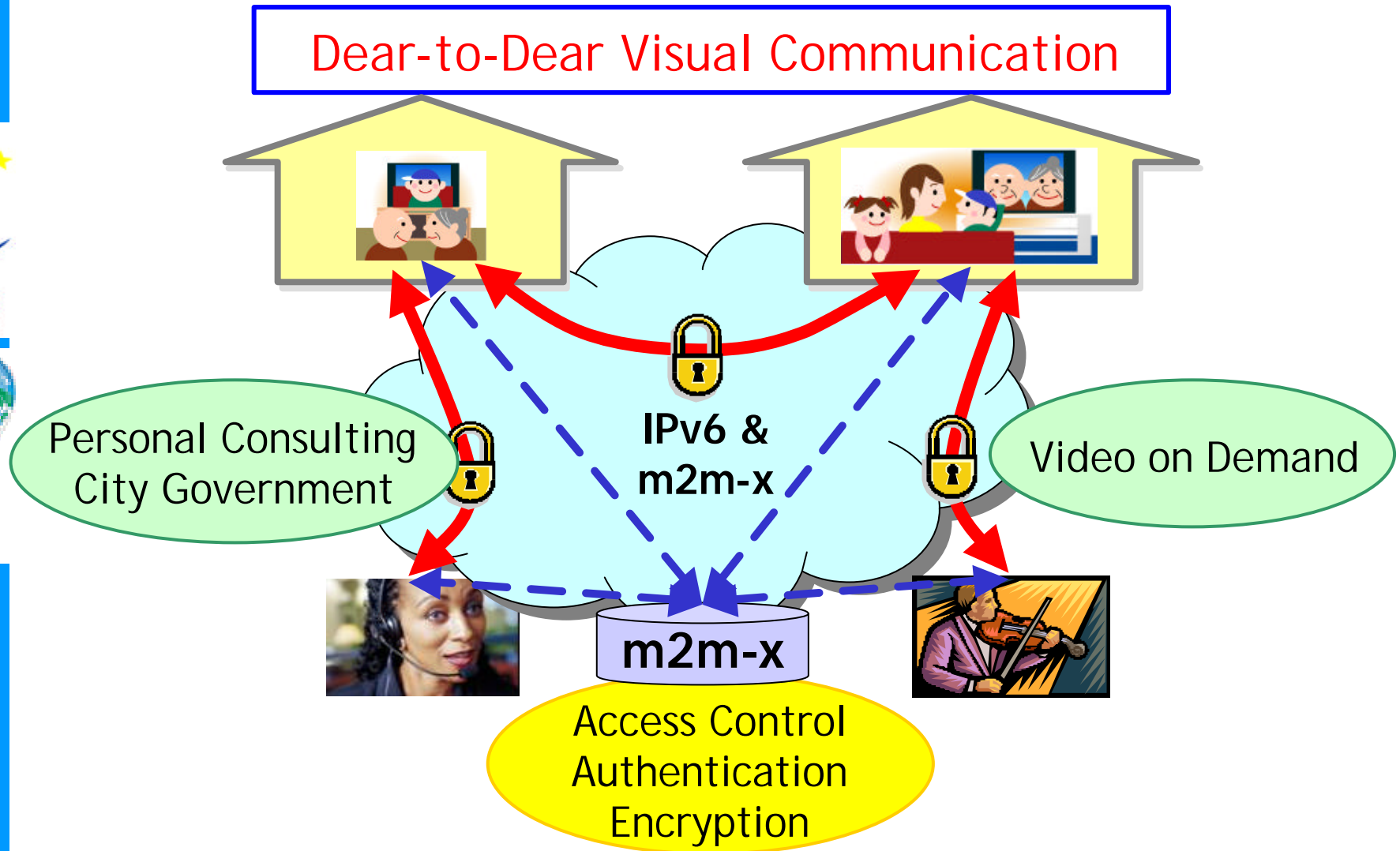
Applications Enhanced by m2m-x (2)

Sensor Network & Home Security

Sensor

Monitor Camera

IPv6 & m2m-x

Autonomous Sensor Cooperation

m2m-x

Access Control Authentication
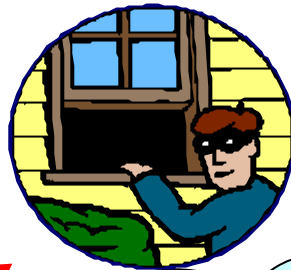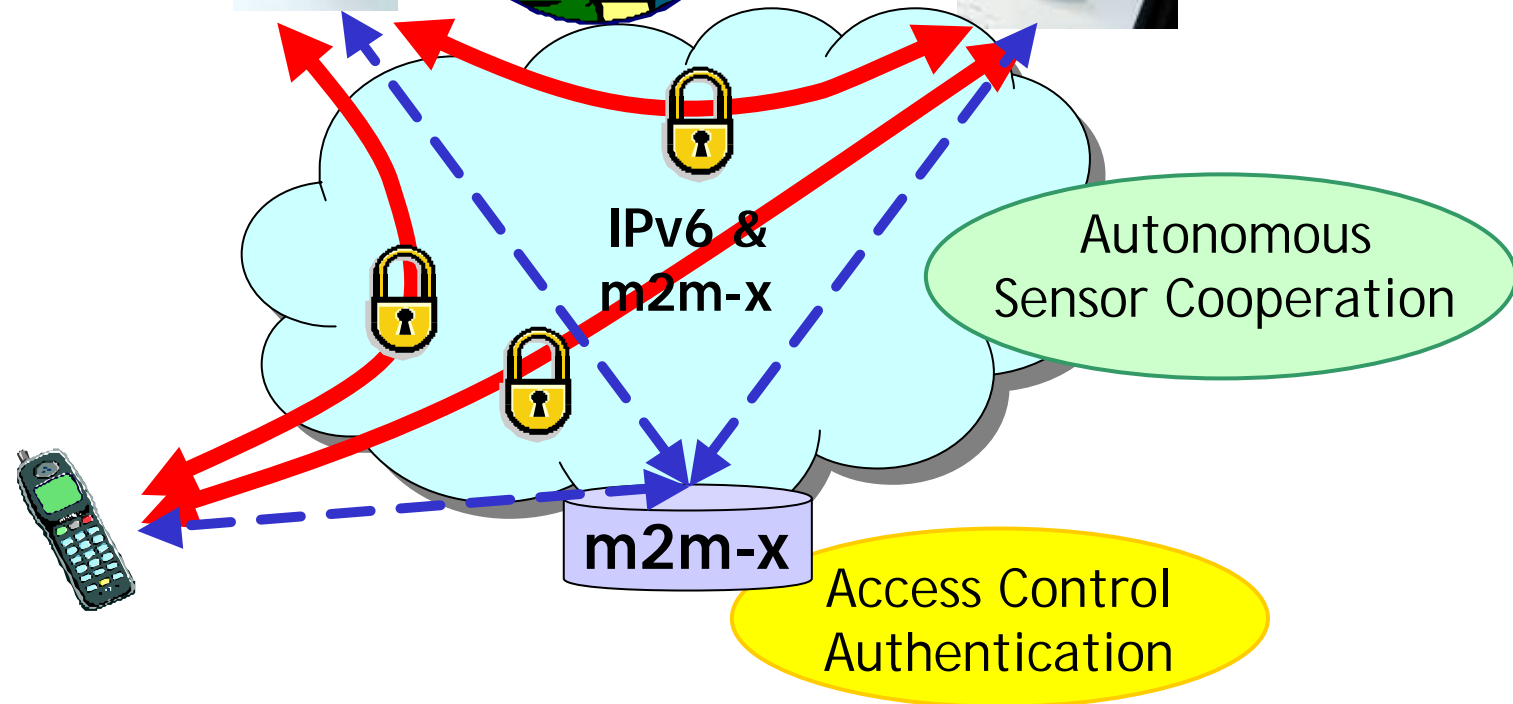
Application for Business Users (m2m-vpn)

Conventional VPN

Developed VPN

Tokyo HQ

Tokyo HQ

High Cost, Narrow Band

VPN

Inflexible Static Connection

Low Cost, Broad Band

Flexible Dynamic VPN

IPv6 m2m-x

M2M Connection

NY Sales Office

Beijing Factory

NY Sales Office

Beijing Factory
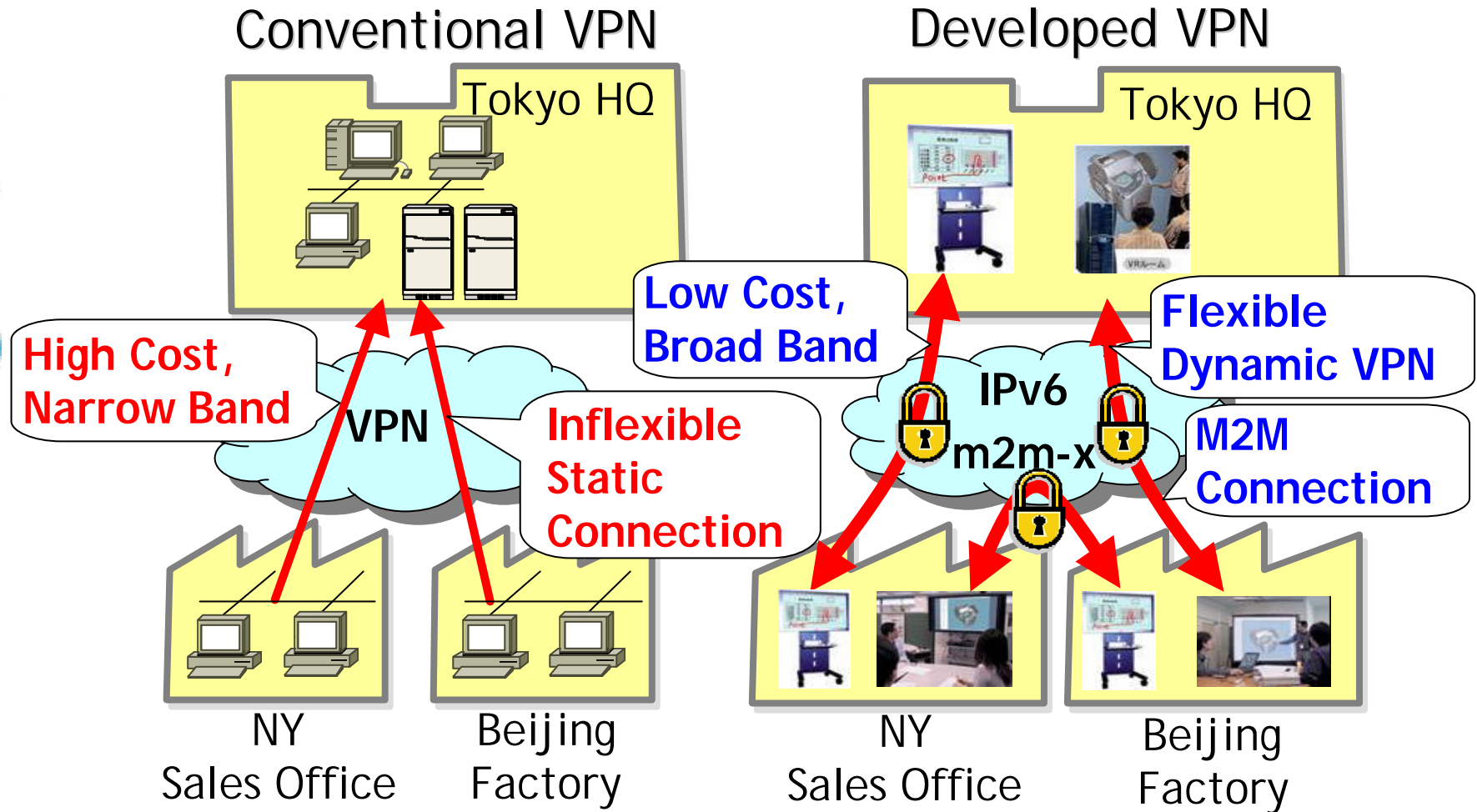
m2m-x Home Appliance Trials
(Tokyo, 2004)

Multi-Media Communication (Sanyo)
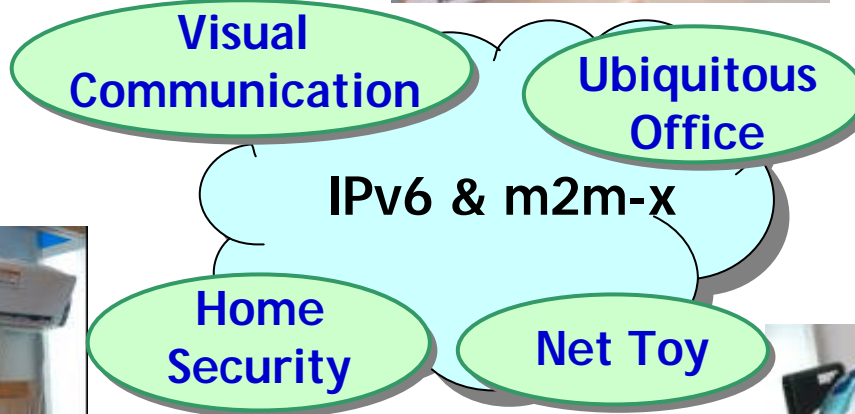
Personal VPN (NTT Com, Fujitsu, Toshiba, DIT)
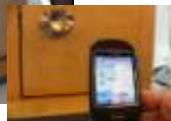
Ubiquitous Printing (Ricoh)

PS2 TV-Phone (Sony)

Visual Communication

Ubiquitous Office

IPv6 & m2m-x

Home Security

Net Toy

Cyber Conference (Pioneer)

Bluetooth Home Security (Toshiba)

EMIT Home System (Matsushita)

Hotline w/ TOY Control Port (Takara)
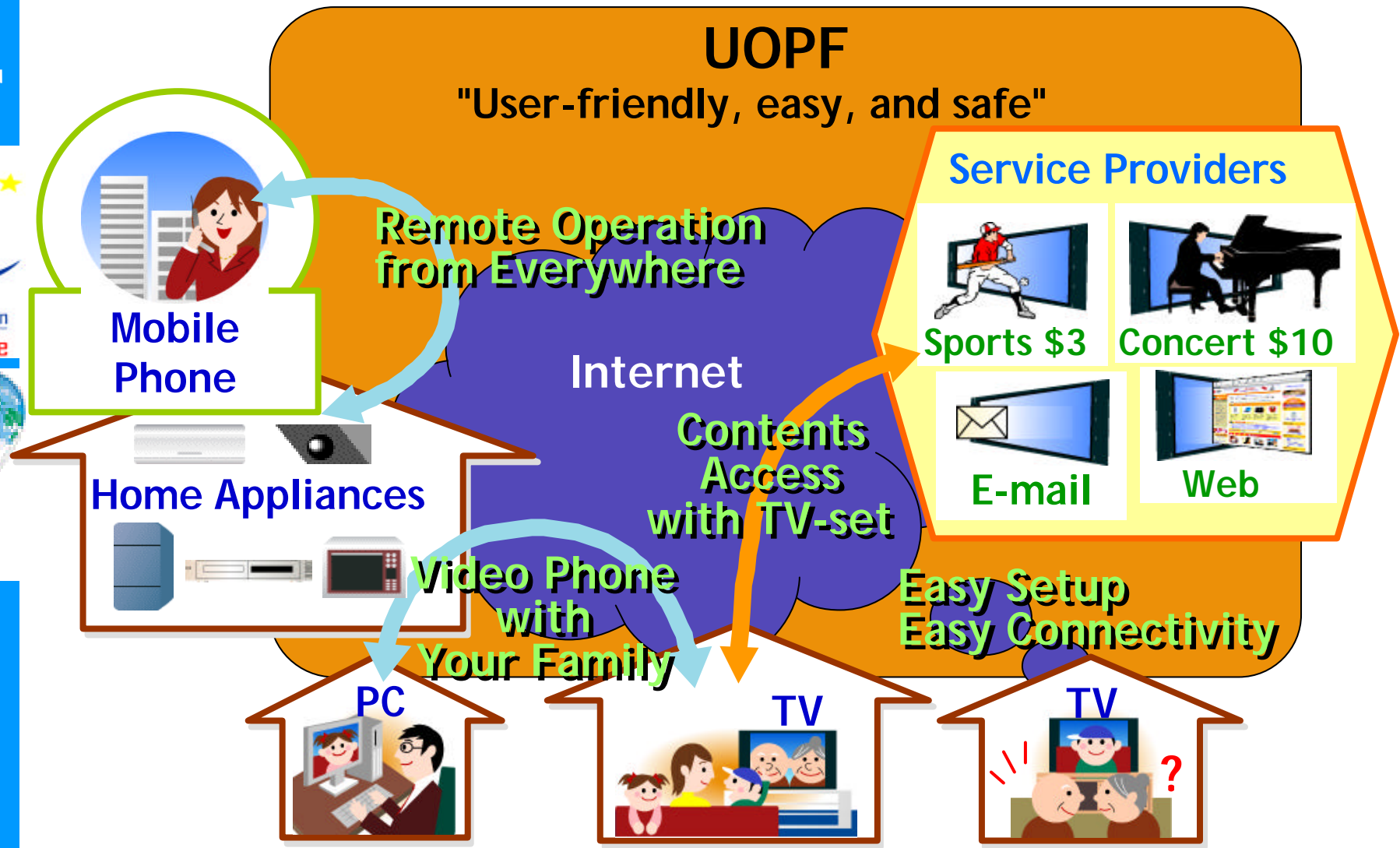
Ubiquitous Open Platform Forum (UOPF)

- Home Appliance Manufacturers and ISPs established "UOPF" to accelerate Internet Home Appliance market (Feb. 10th, 2004)
- NTT Com is leading this forum and acting in key roles
- **m2m-x technology was approved as a UOPF standard specification for M2M communication**

Vision of UOPF

UOPF
"User-friendly, easy, and safe"

Mobile Phone

Remote Operation from Everywhere

Internet

Home Appliances

Contents Access with TV-set

Service Providers

Sports $3   Concert $10

E-mail   Web

Video Phone with Your Family

Easy Setup Easy Connectivity

PC   TV   TV

References

- UOPF (Ubiquitous Open Platform Forum)
  http://uopf.org/en/

- Article on m2m-x
  http://www.ipv6style.jp/en/apps/20040224/index.shtml

- Technical Introduction of m2m-x
  http://www.ipv6style.jp/en/tech/20050131/index.shtml
  http://www.ipv6style.jp/en/tech/20050207/index.shtml