



International Telecommunication Union



IP version 6 (IPv6) Toward the Real-Space Internet

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Univ.of Tokyo / WIDE Project / IPv6 Promotion Council



Workshop on IPv6
Geneva, 22-23 June 2005

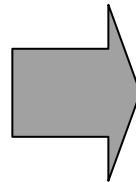




How use the (digital) information ?



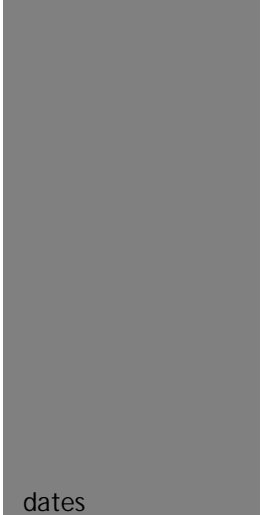
- o Generate
- o Collection
- o Distribution
- o Analyze
- o Process
- o Share



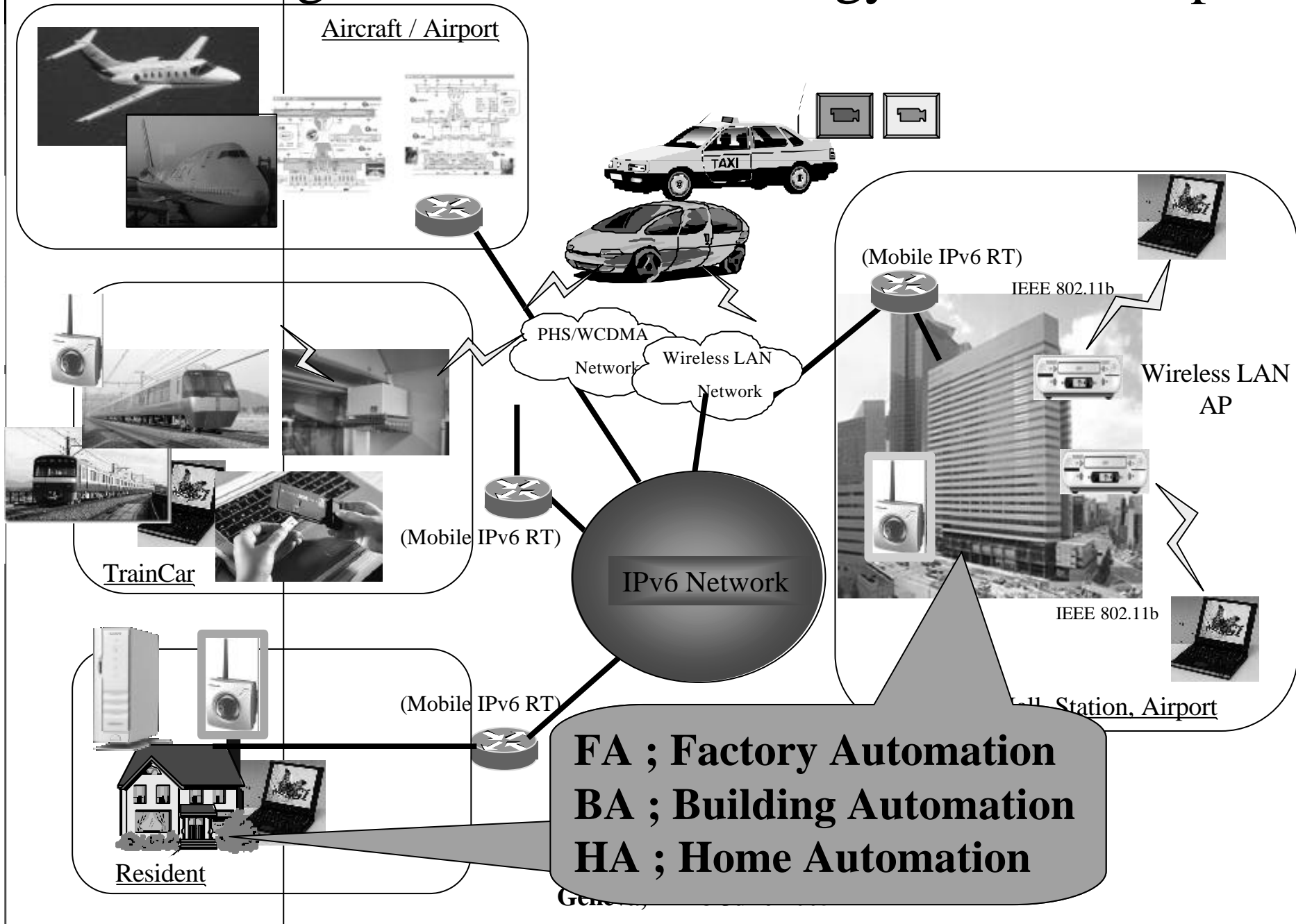
Value/Worth

1. Direct income(i.e.,GET money)
sell some information/contents
2. **In-direct income (i.e., SAVE money)**
 - **Cost-reduction**
 - **Improve efficiency**

Toward SAVE money !!



Integration of IP Technology with Real-Space



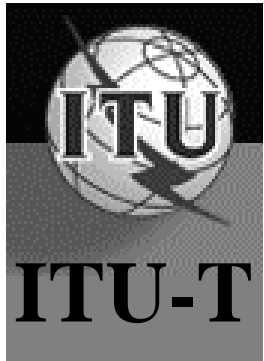


Some Examples of IPv6 Applications

o Toward the Real-Space Internet

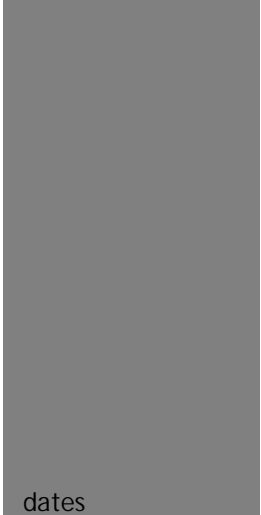
- Transportation System
 - InternetCAR in Nagoya ITS Congress
- Facility Networking
 - Building Automation
 - Live E!, i.e., Sensor Networking
- Real-time Communication
 - Digital Video Transmission
 - VoIP over MIPv6 on Linux by USAGI+Nautilus6
 - IP Telephony (i.e., PBX)
 - Uncompressed HDTV





Reality of IP Mobile

- o IP technology provides “alternative” connectivity to the mobile gadget.
- o Gadget can “not” assume always-on.
 - e.g., No PHS signal here, but is 802.11b signal
- o 3G does “not” provide large bandwidth.
 - But, it is just fine for IP users
 - Cooperate with WiFi and WiMax, due to various reasons

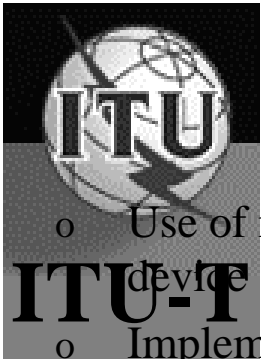


Mobile IP Gadgets

- o IEEE802.11 + VoIP + MIP
 - Also, IEEE802.20, 15, 16
 - Aggregator business
 - (*) cost-reduction and robustness
- o Cellular Phone;
 - Includes IEEE802.11
- o VoIP over SIP/MIP on Linux
 - USAGI + Nautilus6 by WIDE Project



Technology of connecting vehicles to the Internet



- o Use of multiple communication device



- o Implementation of the stable connection through the Internet



- Technologies for vehicle to vehicle communication.



- UDLR Technology

- o Application to other moving objects



IP

Research point for cooperation with other area application

Research point as upcoming infrastructure

Satellite Broadcast

Digital Broadcast

Wireless LAN

PHS

Cellular phone

DSRC

Bluetooth

Wired Connection

IMT2000

Research point as upcoming infrastructure

Point for backing up industries

Research point as upcoming infrastructure

Research point as short-term communication procedure

Research point as upcoming infrastructure

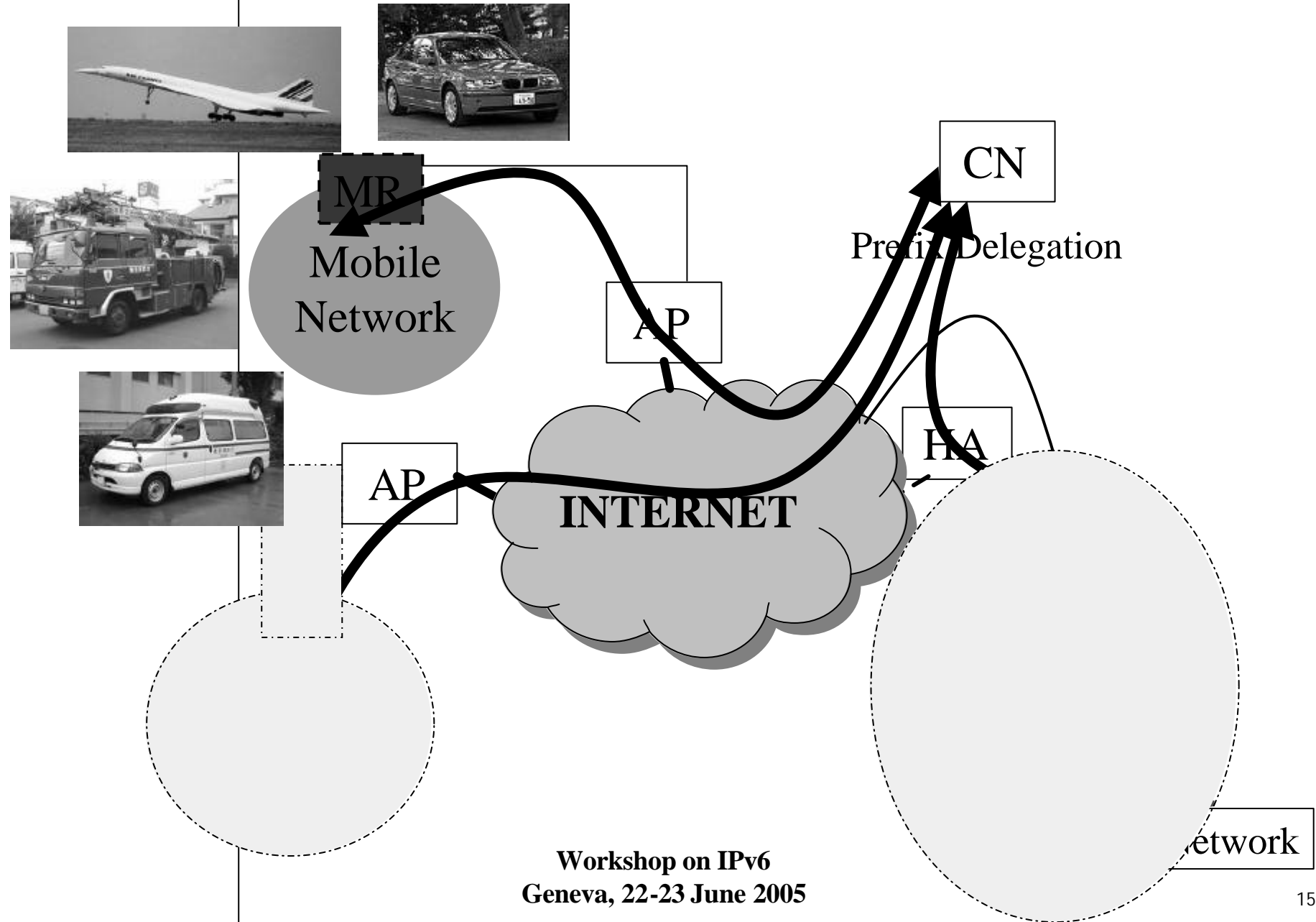


Internet

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Toward the Network Mobility

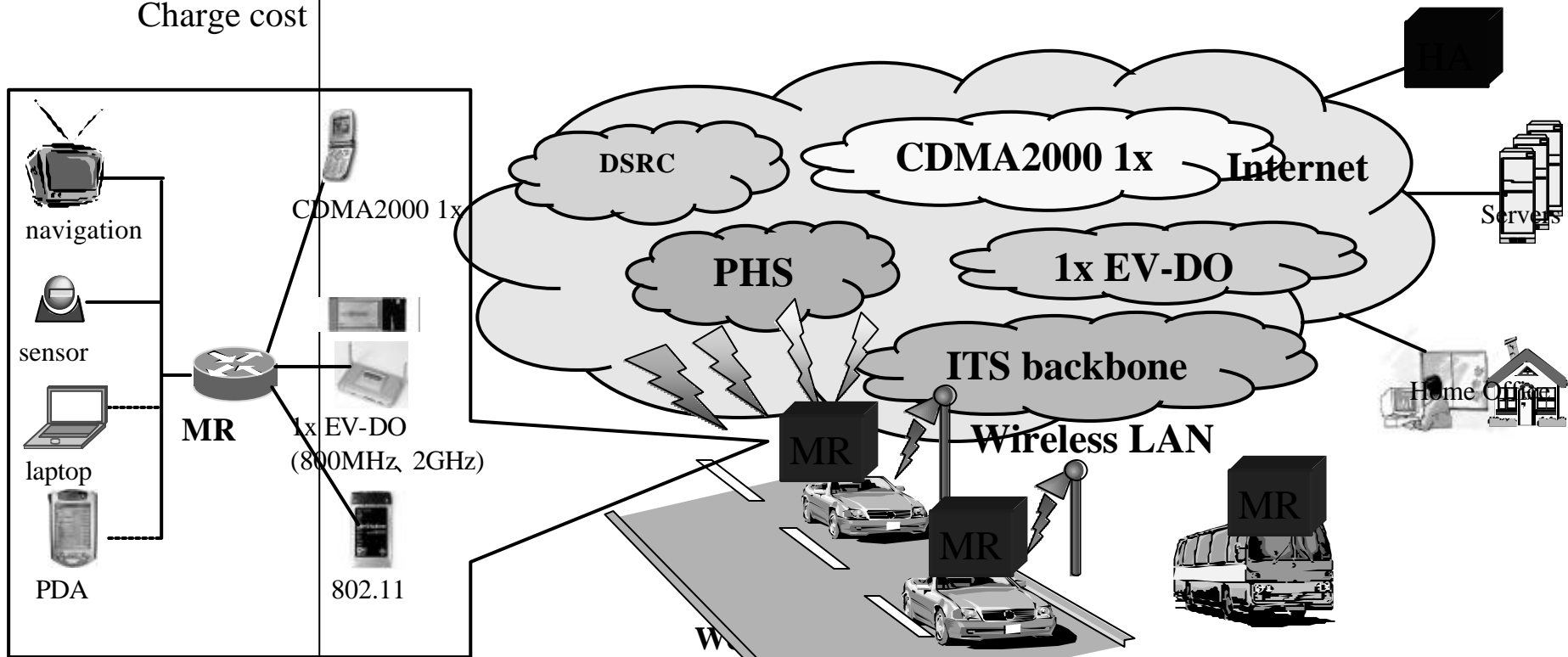


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IP Multihoming for various wireless networks

- demonstration at ITS congress Nagoya, October 2004 -

- o Various wireless networks are available such as 802.11, CDMA2000 1x, CDMA2000 1x EV-DO, PHS, DSRC, etc.
- o Wireless system has different characteristics in terms of coverage area, Bandwidth, Delay, Charge cost
- o Utilizing multiple wireless networks simultaneously for wider bandwidth
- o Multiple bi-directional tunnels between MR and HA to efficiently use all wireless networks



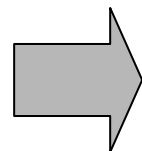
example of vehicle's network

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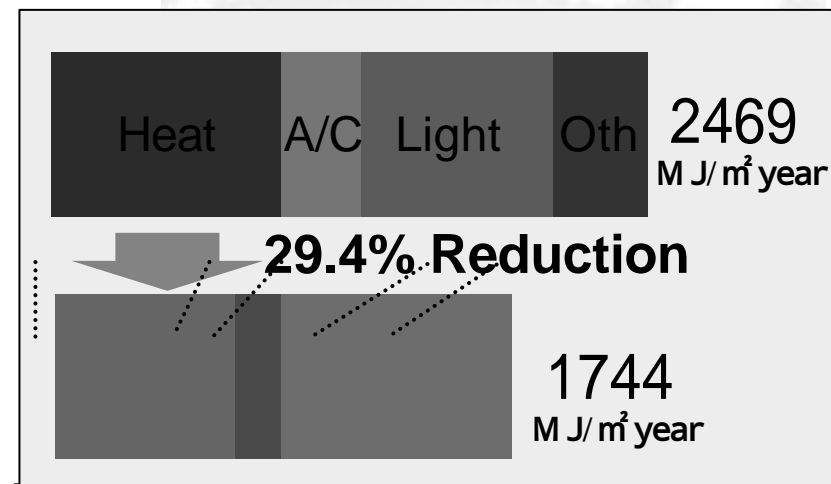
Example ; Building Automation



- o Huge operational cost
 - Large energy (e.g., gas, electricity) cost
 - About 30% energy saving has achieved !
- o Proprietary technologies
 - Let it be open technology
 - Each systems use different technology
- o COP3 by UN
 - 10%-30% energy saving

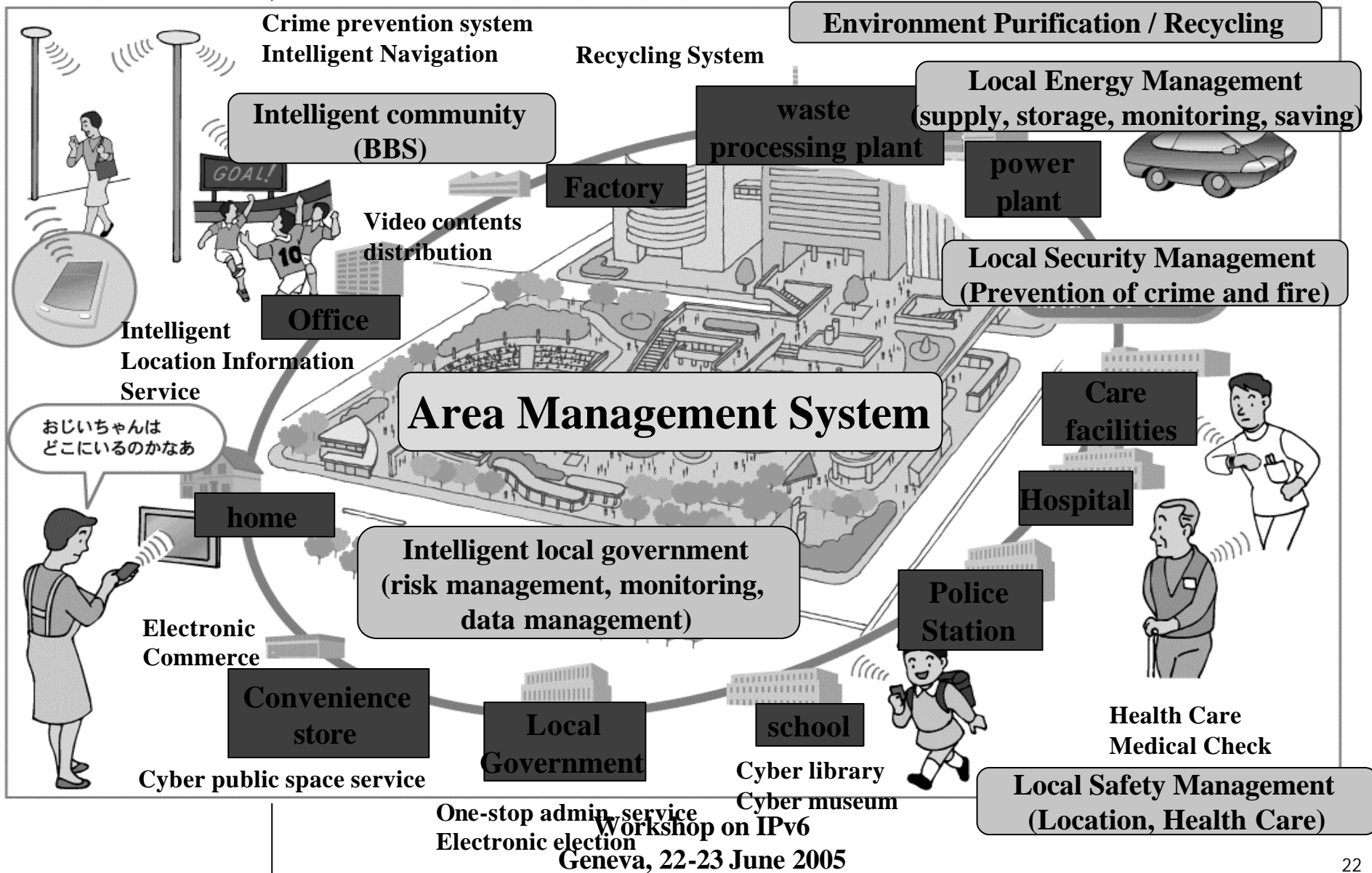


1. Improve portfolio
2. Increase value



IPv6 Deployment Example: TOWN

Matsushita Electric Works



World first interoperability of BA controllers via IPv6 transport with LON Works and BACnet

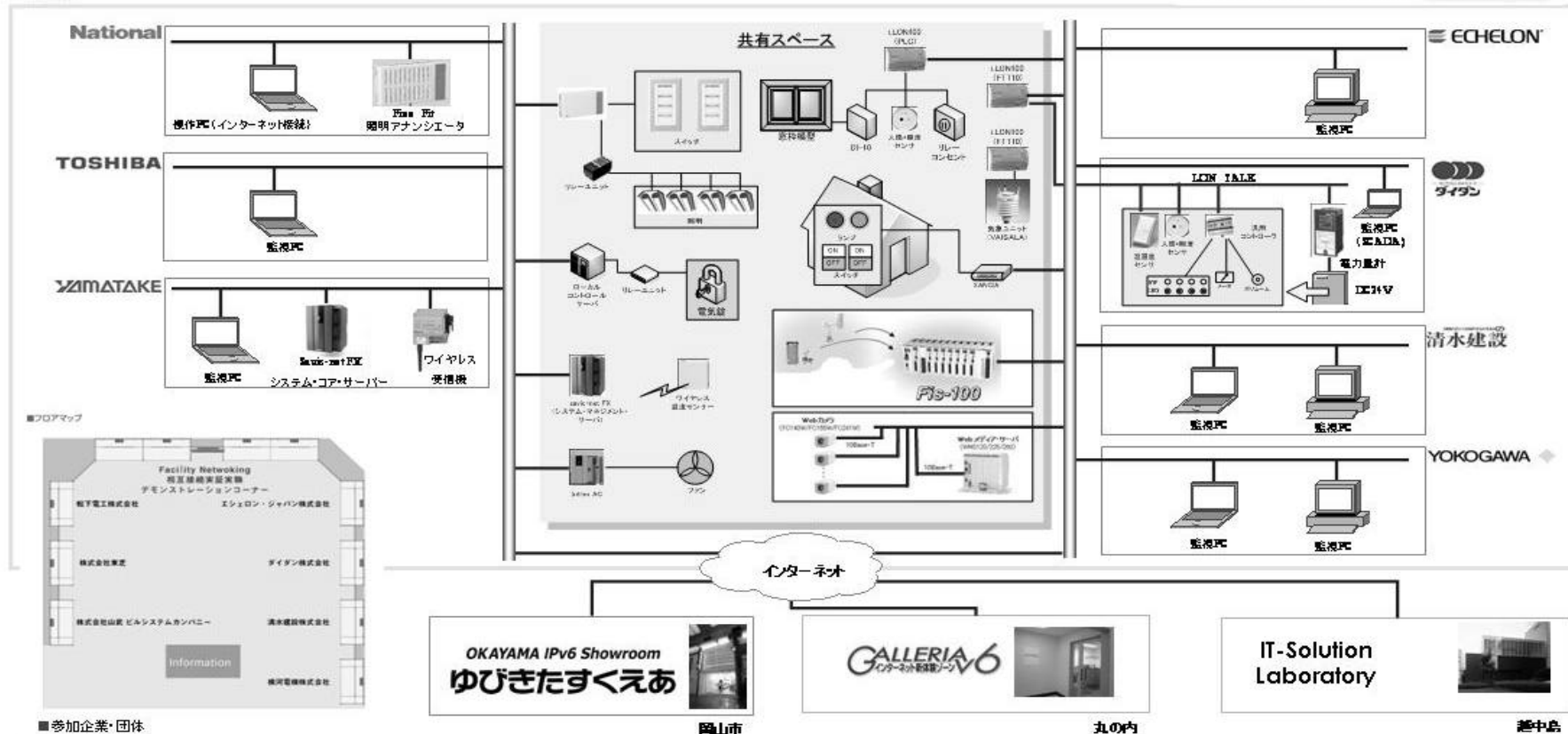
業界の2大標準ともいえるLONWORKSやBACnetといった既存ファシリティ管理専用プロトコルについて、IPv6ネットワークに集約することで、各社のデバイス等を他社の監視用クライアントで制御・監視できる等、世界初のIPv6でのマルチベンダーによるファシリティ・マネジメント・ネットワークを実現いたしました。仕様のオープン化、IPv6ネットワークの利用、そしてこれらの下で機器を個別にきめ細かく制御することで、大幅なコスト削減と省エネルギー効果が期待できます。既設のイーサネットをインフラとして活用でき、管理の用途や環境にあわせて、様々なベンダーからデバイスや管理ツールを選択・接続できるユビキタスなファシリティ管理環境を体験してください。

Facility Networking Showcase

世界初！ IPv6でユビキタス制御が可能になる
ファシリティネットワーク相互接続実験



～IT業界とファシリティ業界の大手有力7社が参加～



■参加企業・団体

ECHELON
エシロン・ジャパン株式会社

清水建設
清水建設株式会社

ダイワ
ダイワ株式会社

TOSHIBA
株式会社東芝

National
松下電工株式会社

MRI
株式会社三菱総合研究所

YAMATAKE
株式会社山崎ビルシステムカンパニー

YOKOGAWA
横河電機株式会社

2004.11.16

Facility Networking



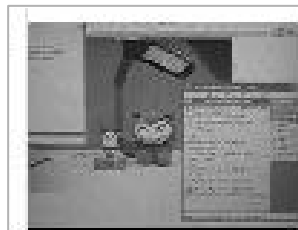
- o Information System
- o Security System
- o Facility Control
- o Sensing System
- o Integration with RF-ID/Auto-ID



Matsushita Electric Works
EMIT Total Buildings. System Controller for floor management



Yokogawa
"Xancia"
(All-purpose Controller)



Lighting control
Via MS Messenger



Remote monitoring
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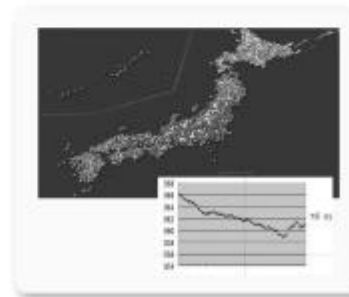
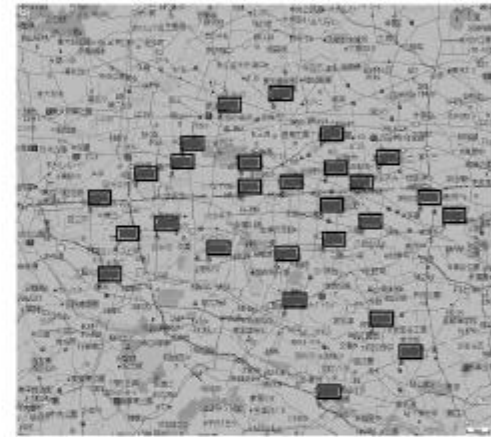
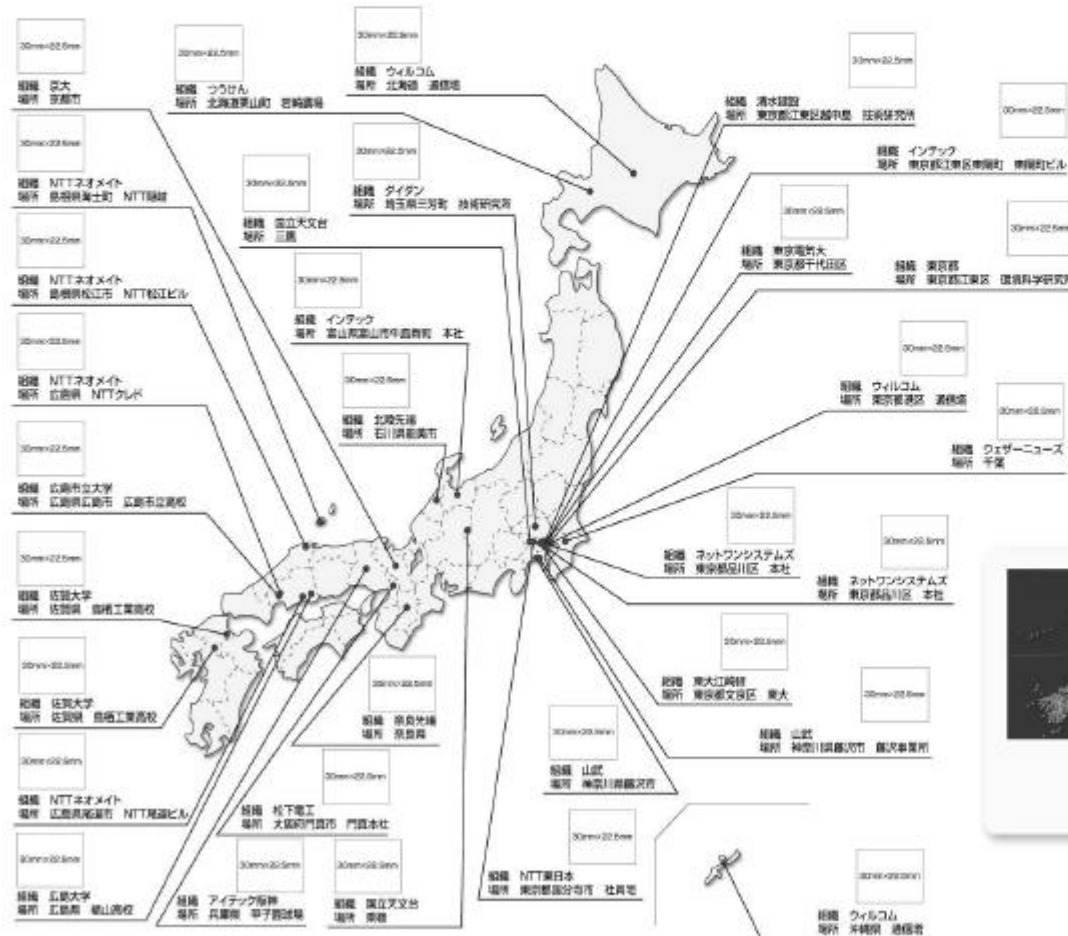


Yokogawa
Networked Audition Machine &
"Fis" Environment Analysis System

Weather monitoring

Weather Center IPで実現する気象データ収集インフラ

toward Km-mesh



協力

気象観測機提供

- 東京大学 気象大学
- NTTネオメディア 気象観測システム
- ネットワンシステムズ
- ワイコム 気象観測システム

サーバ提供

- 東京大学 気象大学

気象コンテンツ作成

- ウェザーニュース

3次元ディスプレイ

- 株式会社

システム構築

- エシロン ECHELON
- デザイン 株式会社



VoIP and IP Telephony

- o Huge number (10M+) of IP-Phone installation
 - Triggered by yahoo BB, using the terrestrial phone number
 - NTT group, KDDI and Fusion Comm.
 - PBX migration
- o Started VoIP/SIP Interoperability Task Force
 - Run by JPNIC
 - Collab. With SIP Forum/SIPit, MSF, IPCC
 - Include IKE and ENUM
 - Will include SIP/ENUM over Mobile IPv6

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20,000 IP-Phones At 280 sites ! within 9 months

The screenshot shows a web browser window with the title "IPv6style:Freebit to Deploy IPv6 Centrex Service of 20,000". The address bar shows "http://www.ipv6style.jp/en/". The page content includes the "IPv6style" logo and the headline "Freebit to Deploy IPv6 Centrex Service of 20,000". The date "(2004.6.7)" is displayed. The main text describes a collaboration between Freebit and Kyoritsu Maintenance Co., Ltd. to provide Internet and IPv6 Centrex services to approximately 300 sites, with 20,000 phone sets to be deployed by the end of 2004. It details the service offering, pricing, and the role of IPv6 in simplifying network design.








Freebit collaborates with Kyoritsu Maintenance Co., Ltd. to offer the Internet connection service and IPv6 Centrex service for approximately 300 sites. Kyoritsu Maintenance manages and operates dormitories for students and corporate employees. More than 20,000 phone sets will be deployed for this service. With the success of a trial deployment at a site, all implementation at 300 sites will be finished by the end 2004.

This offering from Freebit is a customized version of its IPv6 IP Centrix service "Freebit OfficeOne IP Business Phone" which has already been offered to enterprise users since the end 2003. Each dormitory will be given B FLET'S optical access to accommodate the Internet connection service. In addition, IPv6 compatible telephone sets are used for voice communication under direct control by the Freebit IP Centrex server. Kyoritsu Maintenance charges 1,890 yen for the phone service alone and 3,780 yen for both phone and the Internet connection services on a monthly basis. Voice communication between the dormitory residents under Kyoritsu's management is free, and external voice communication is offered at a low price comparable to the generic IP telephony service.

Hiroki Ishida, CEO of Freebit Co., Ltd., said "IPv6 simplified the network design dramatically and enabled deployment at so many sites in such a short period at a low cost".

Significant reduction of network design steps

IPv4  **IPv6**

TEL	Configure phone number		TEL	Configure phone number
TEL	Configure default gateway			Not required
TEL	Configure subnet mask			Not required
TEL	Configure IP address			Router advertisement by IPv6
LAN	Configure VPN of router			Feel6 ID and PW
NET	Configure VPN			Feel6 ID and PW
NET	Configure network address			2 ⁸⁰ addresses

FreeBit Co., Ltd.

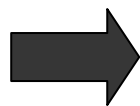
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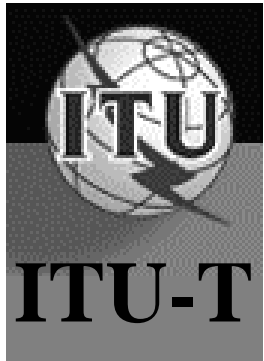
FACTs and Lessons from this IP-Centric Migration



- o Simple and small number of installation types. i.e, only three in this case
 - Less design cost and easier installation manuals
- o Small number of mis-configurations
 - Reduce expensive engineers' technical supports, i.e., from 300 to single number.
- o Easier trouble-shooting
 - Identify the trouble, easier



**All are contributed cost reduction caused
by human resource**



VoIP & Multicasting

- o NTT East & West, Plala
 - VoIP service with IPv6
 - Multicasting streaming service with IPv6



- o DV(Digital Video) Multicasting over JGN2



- o DV over IPv6 for TV productions
 - Portable DVTS gear
 - DV switcher
 - ➔ direction of digital appliances networking

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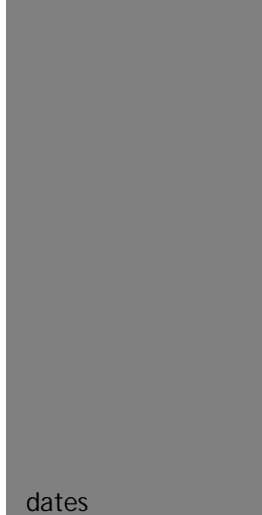
NTT East & West switched on IPv6 - covers nation-wide -

- o NTT West, since December 24, 2004.
 - Contents distribution
 - Multicasting and VoD
 - High quality video-phone, with instant messaging
 - Fairness control /Queuing
 - IPv4 over IPv6 for legacy ISP
- o NTT East
 - Contents Distribution
 - Multicasting and VoD
 - High quality video-phone
 - FLET's Net
 - Multi-Homing (plan)



NTT Regional Co.
IP Video Phone

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Lesson from Full Transition at KDDI Lab.

How CEO persuade IT section

Q. Which applications are actually used for business activities in the company ?

A. It is.....Web, email, ftp and some others.

Q. Can these applications can run with IPv6 ?

A. Yes, all of them can run with IPv6

Q. Is the security serious issue for corporate network?

A. Yes, it IS.

Q. Do you want to control the applications run in the network?

A. Yes.

➔ **DONE ! We can and should transit to IPv6.**

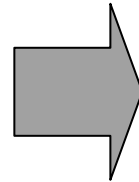


Summary

How use the (digital) information ?



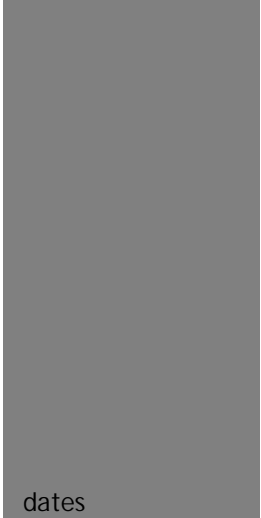
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Value/Worth

1. Direct income(i.e.,GET money)
sell some information/contents
2. **In-direct income (i.e., SAVE money)**
 - **Cost-reduction**
 - **Improve efficiency**

Toward SAVE money !!





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THANK YOU

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