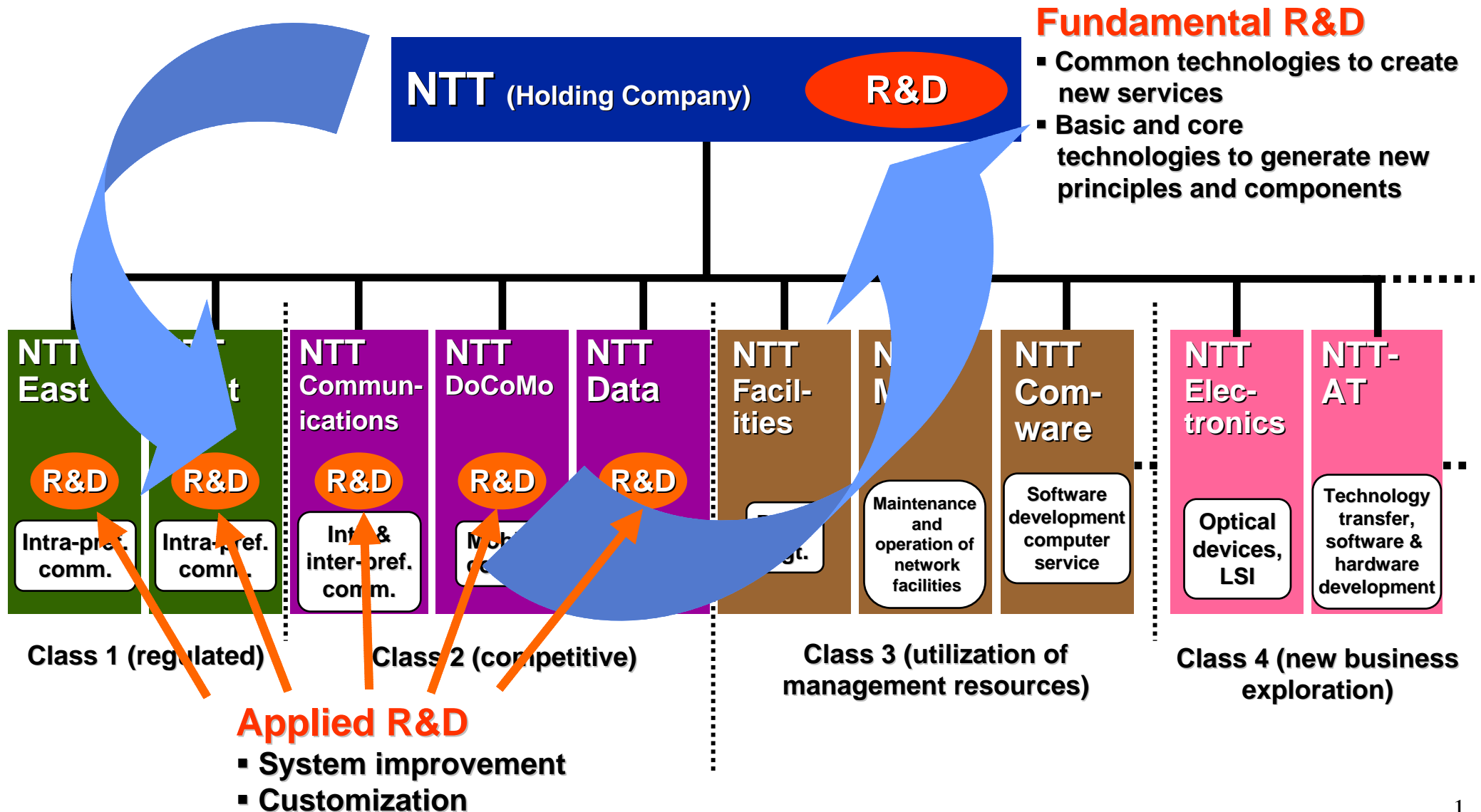

*Enhancing IP networks to support
consecutive killer applications*

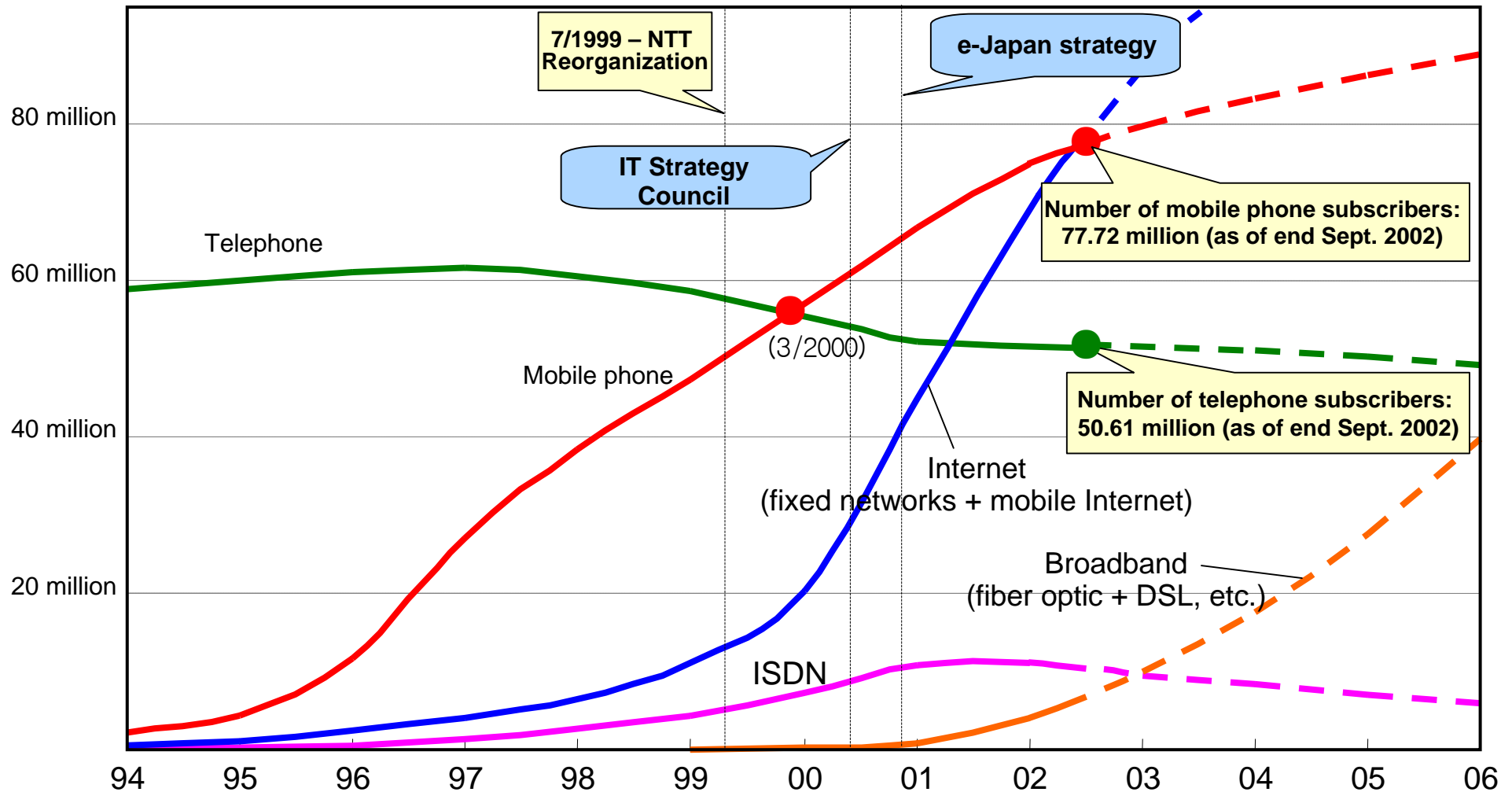
Tadanobu OKADA

**Vice President, Director
NTT Network Service Systems Laboratories**

Organization of NTT Group



Changes in the numbers of subscribers and users



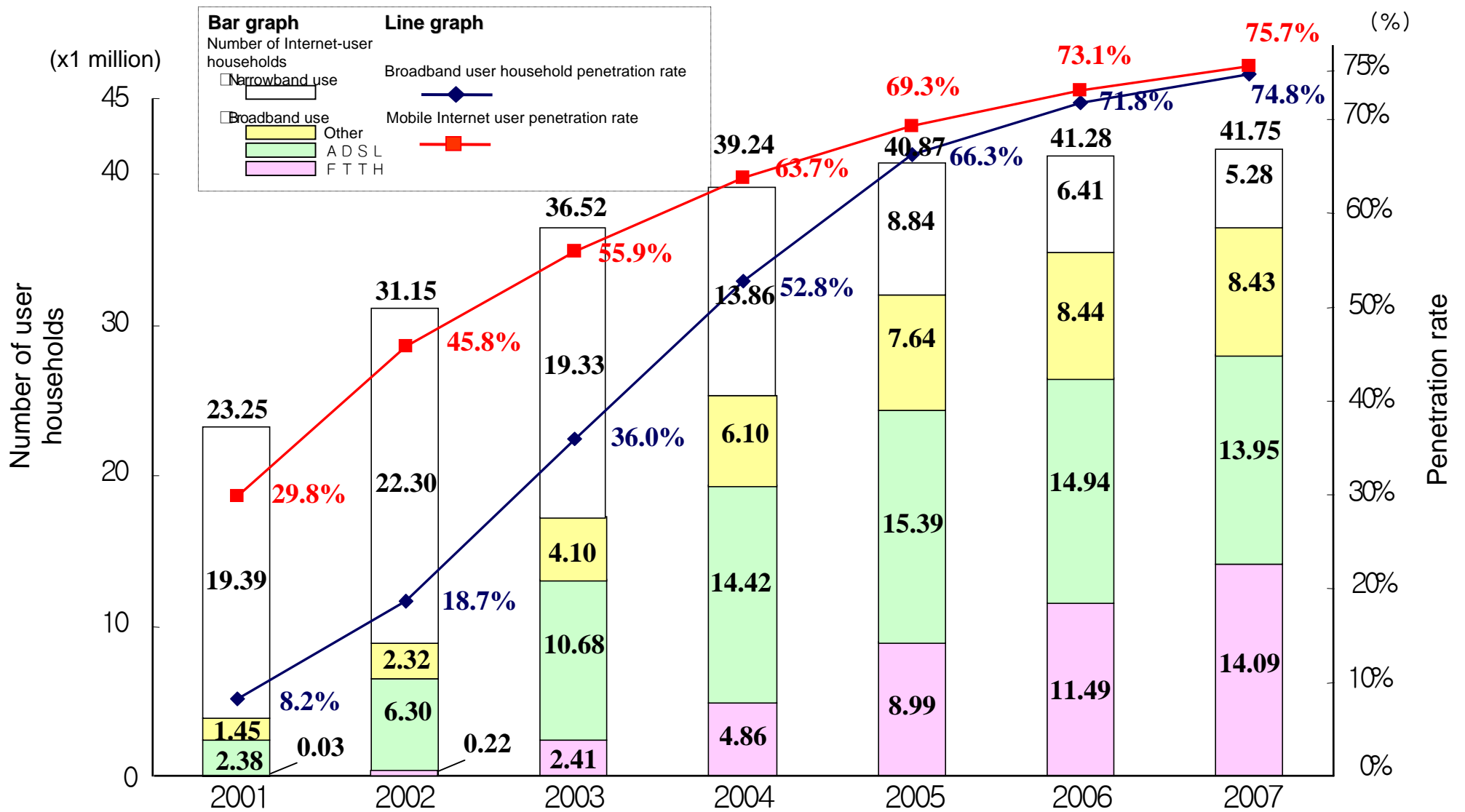
Note 1: Numbers of telephone and ISDN subscribers after 2002 are an NTT projection.

Note 2: Numbers of mobile phone subscribers are a projection of the Mobile Computing Promotion Consortium (MCPC).

Note 3: Numbers of Internet users are a projection of InfoCom Research Inc.

Note 4: Numbers of broadband user households are the target of the e-Japan strategy.

Internet-user household projections

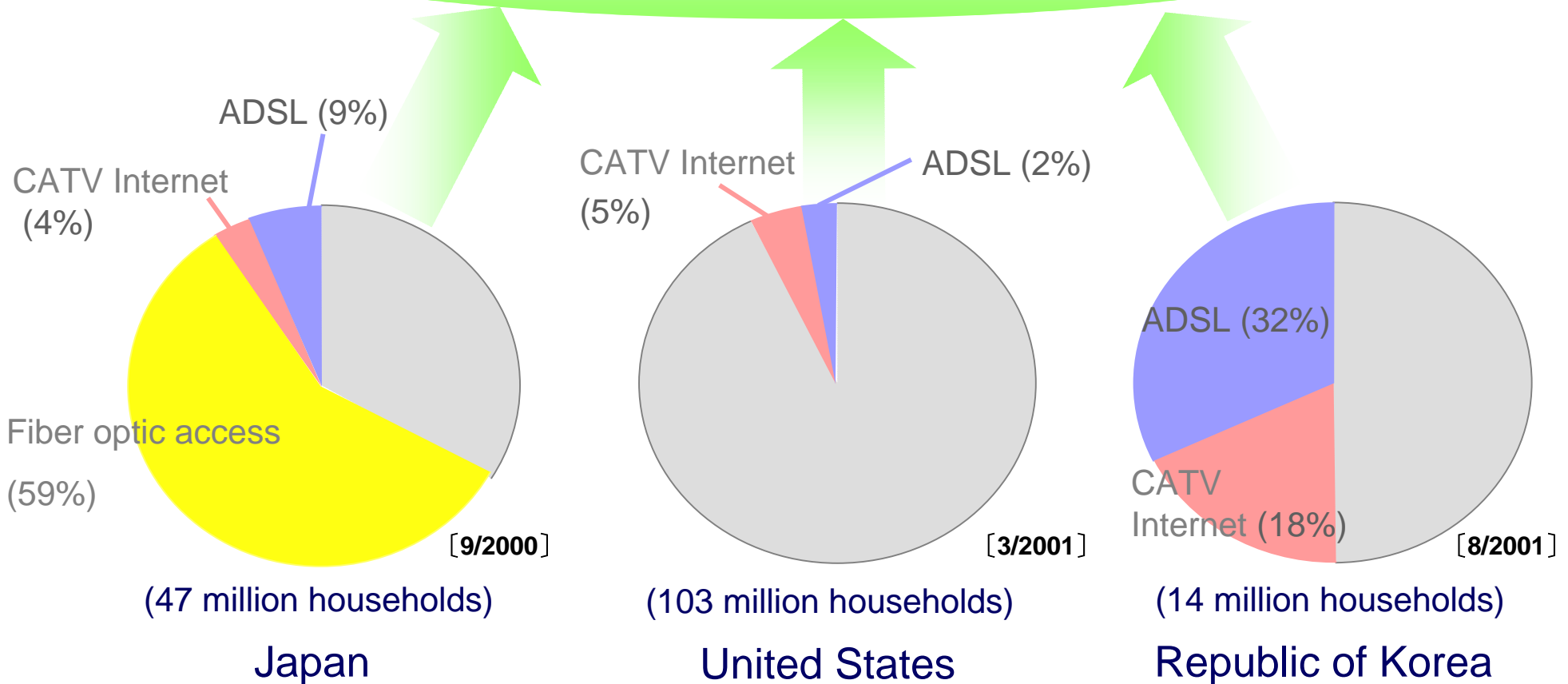


(Source: InfoCom Research, Inc.)

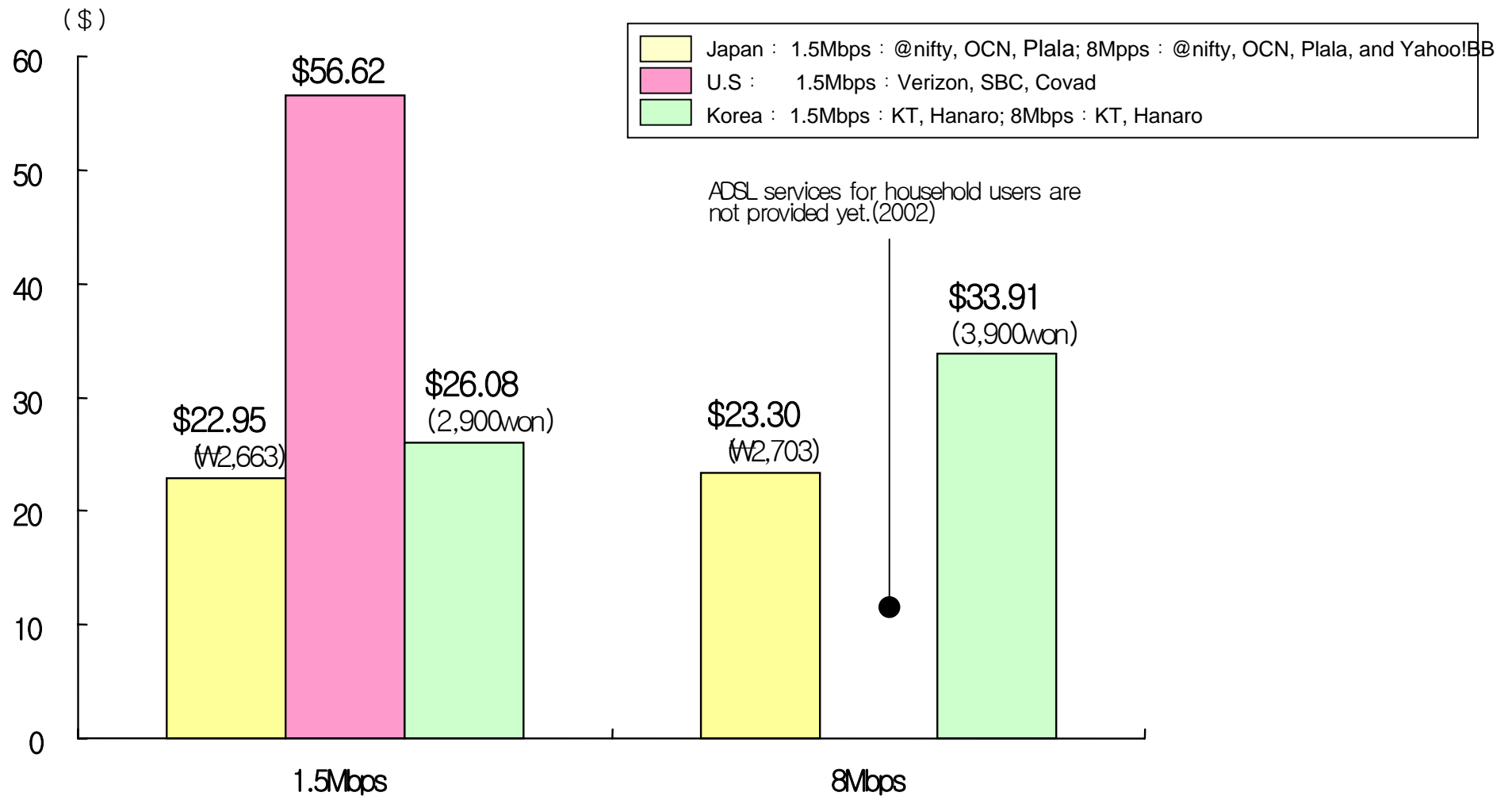
Broadband access penetration

Broadband environment

(high-quality movies, interactive, constant connection)



Monthly ADSL service fees in Japan, the US, and Korea



Note 1: Fees compared: ADSL subscriber fees, ISP fees and NTT line connection charge (applicable in Japan only).

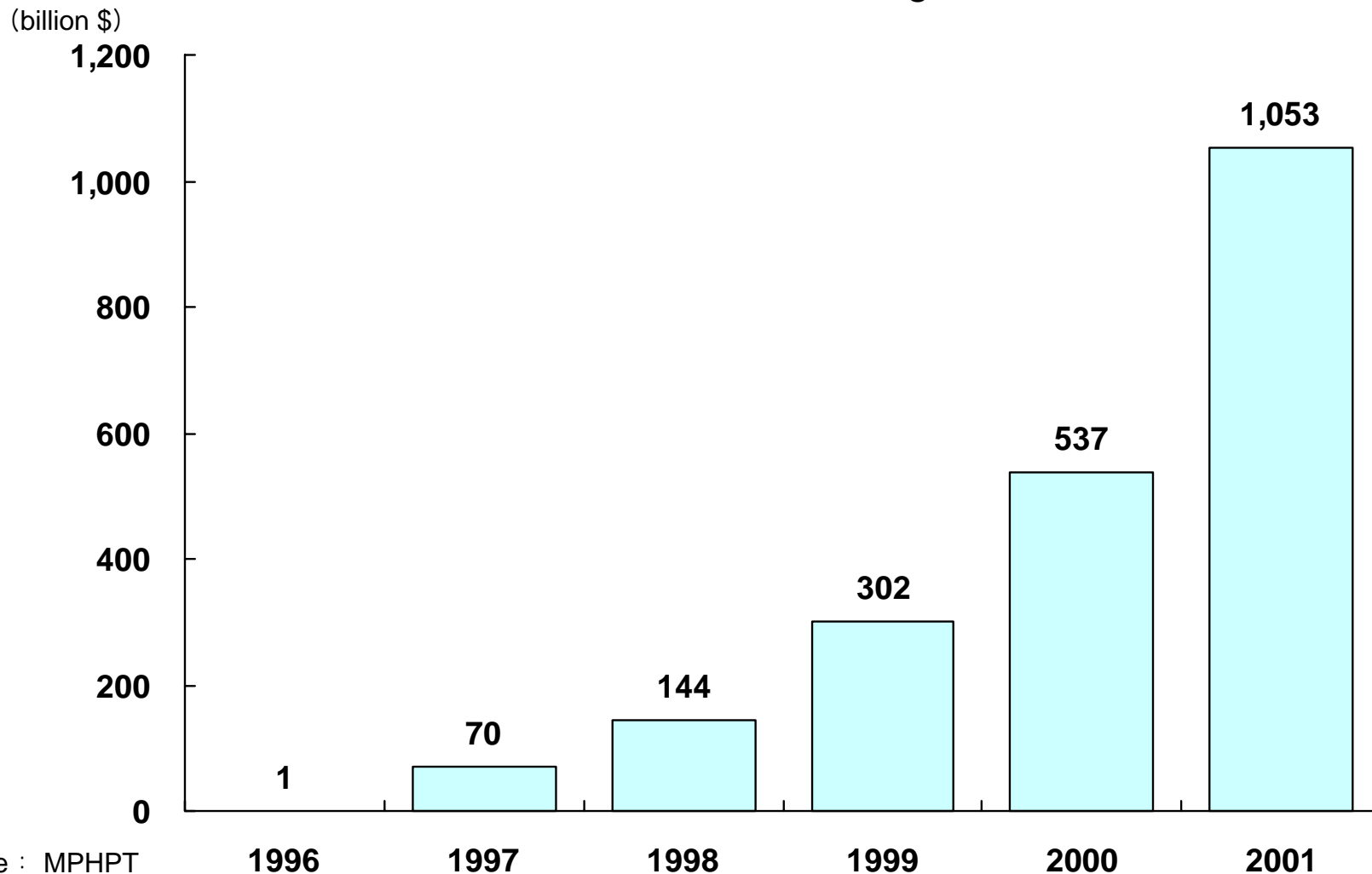
Note 2: Dates of calculation: September 1, 2003 for fees in Japan; April 1, 2002 for fees in the US; January 2002 for fees in Korea.

Note 3: Exchange rates: ¥120.2 to the U.S dollar; ₩0.1045 to the Korean won.

Source: "Predicting the Spread of the Internet," May 21, 2002, InfoCom Research, Inc.

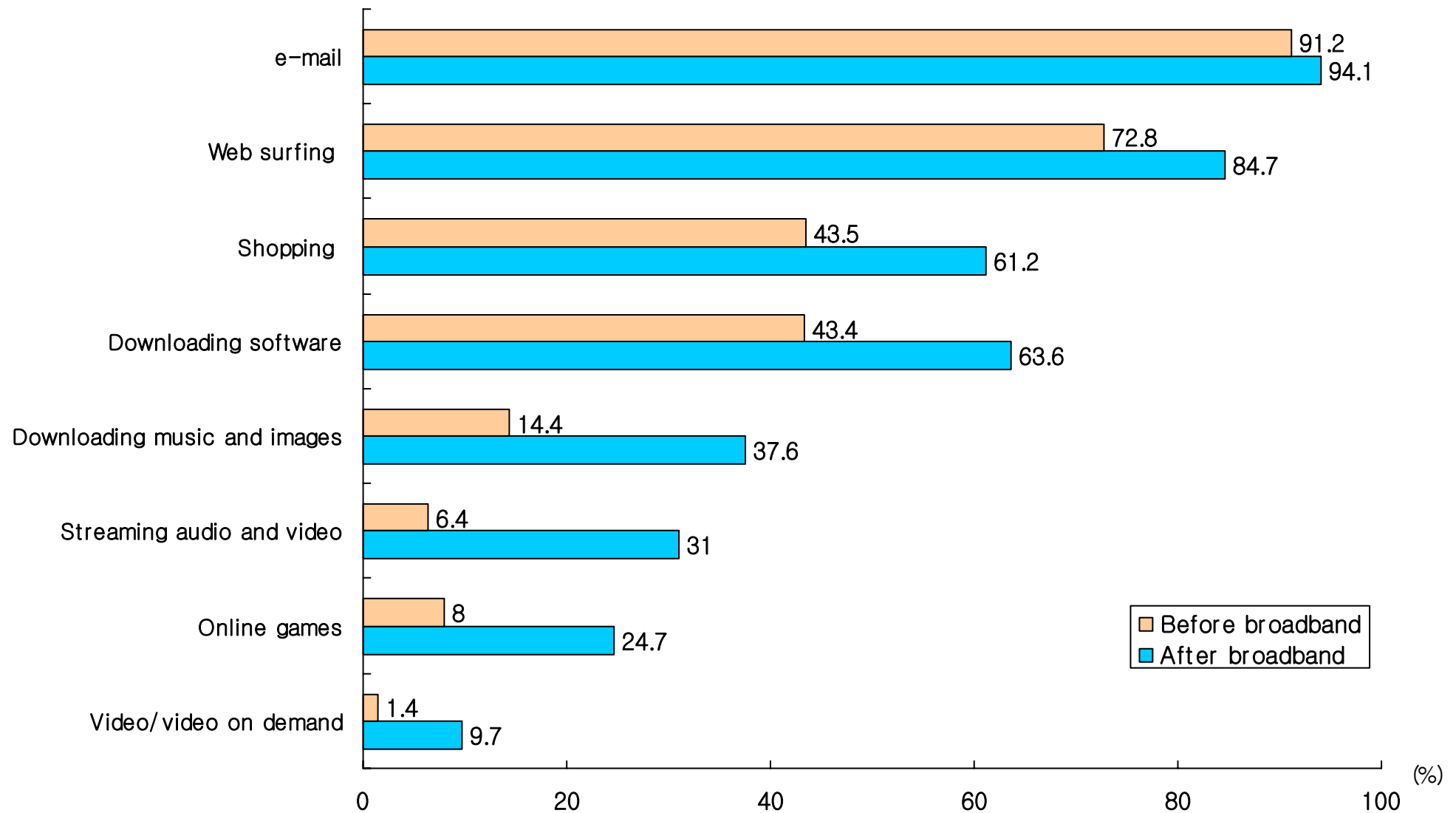
Changes in the electronic commerce (final consumption goods) market

Electronic Commerce (EC) : Commercial transactions involving the ordering of goods and services on the network using TCP/IP.



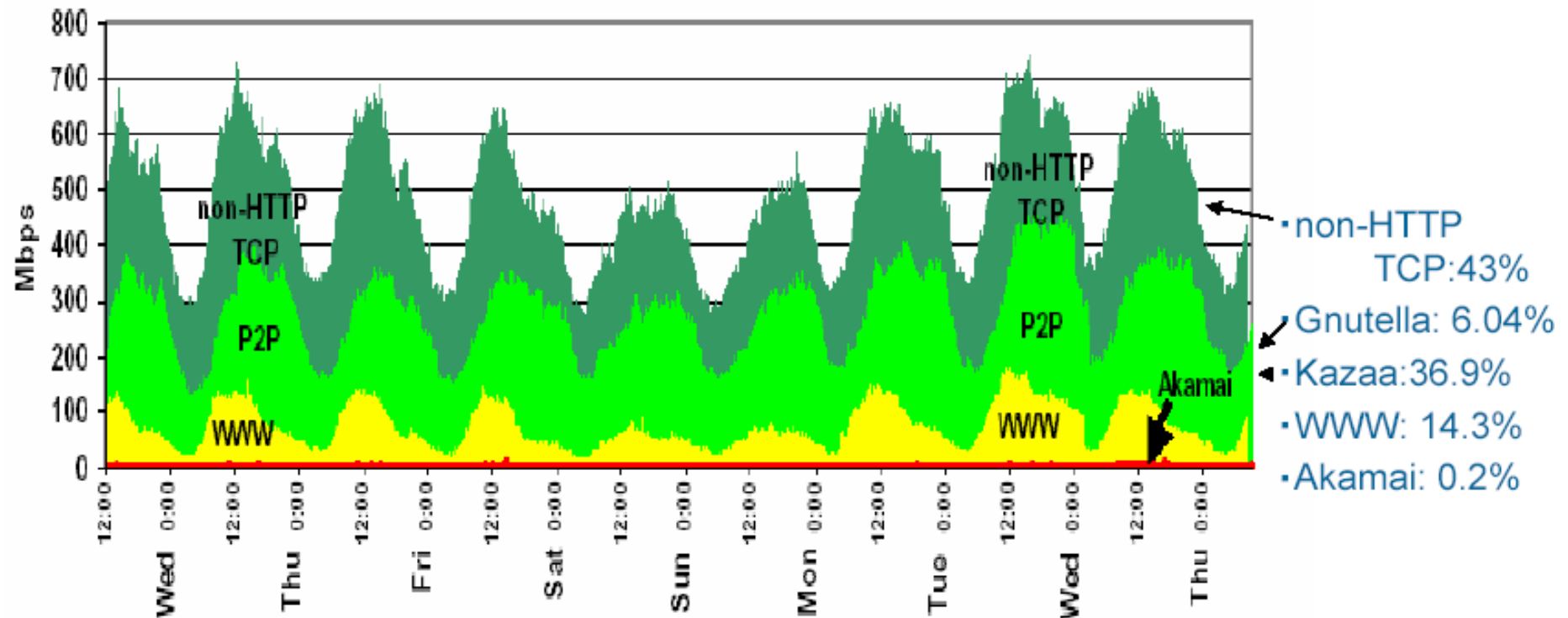
Source : MPHPT

Changes in the use of contents before and after broadband



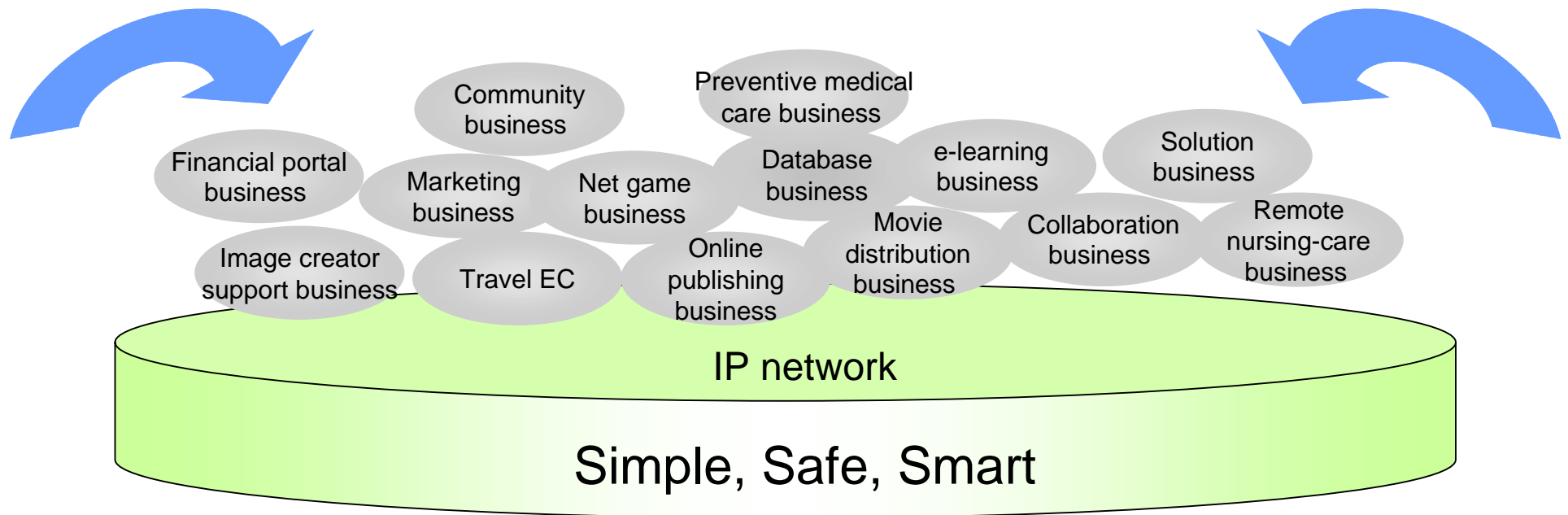
Source: An Outlook for the Spread of the Internet, May 21, 2002, InfoCom Research, Inc.

Bandwidth usage by several contents delivery systems (actual data)



Source: Stefan Saroiu, Krishna P. Gummadi, Richard J. Dunn, Steven D. Gribble, and Henry M. Levy;
“An analysis of Internet content delivery systems”, Proc. of the 5th Symposium on Operating
Systems Design and Implementation, December 2002.

IP network as an infrastructure



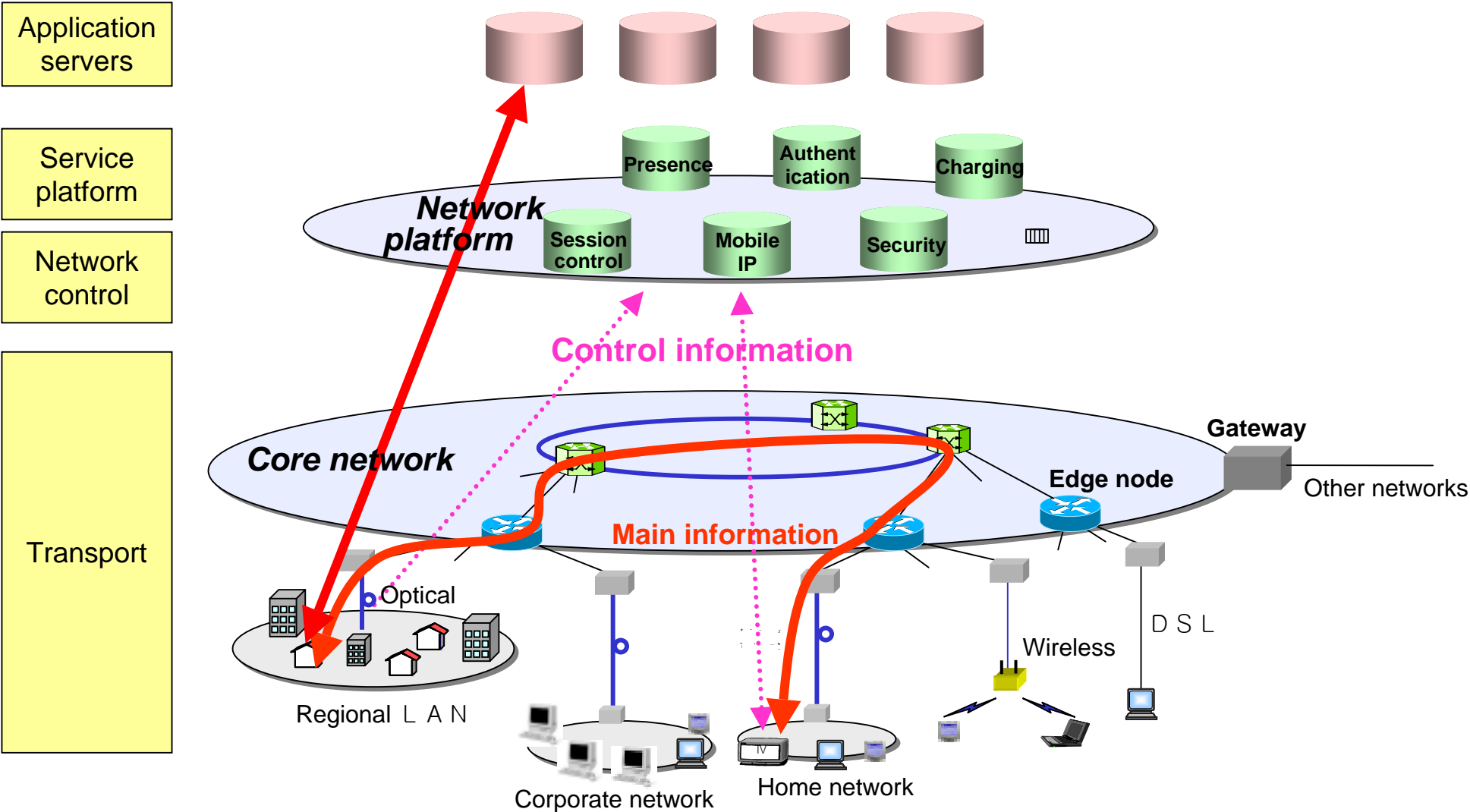
IP network should grow into a sound infrastructure on which various business players provide users with “killer” applications and get money.

Requirements for IP telecommunication network

IP network should become simple, safe, and smart.

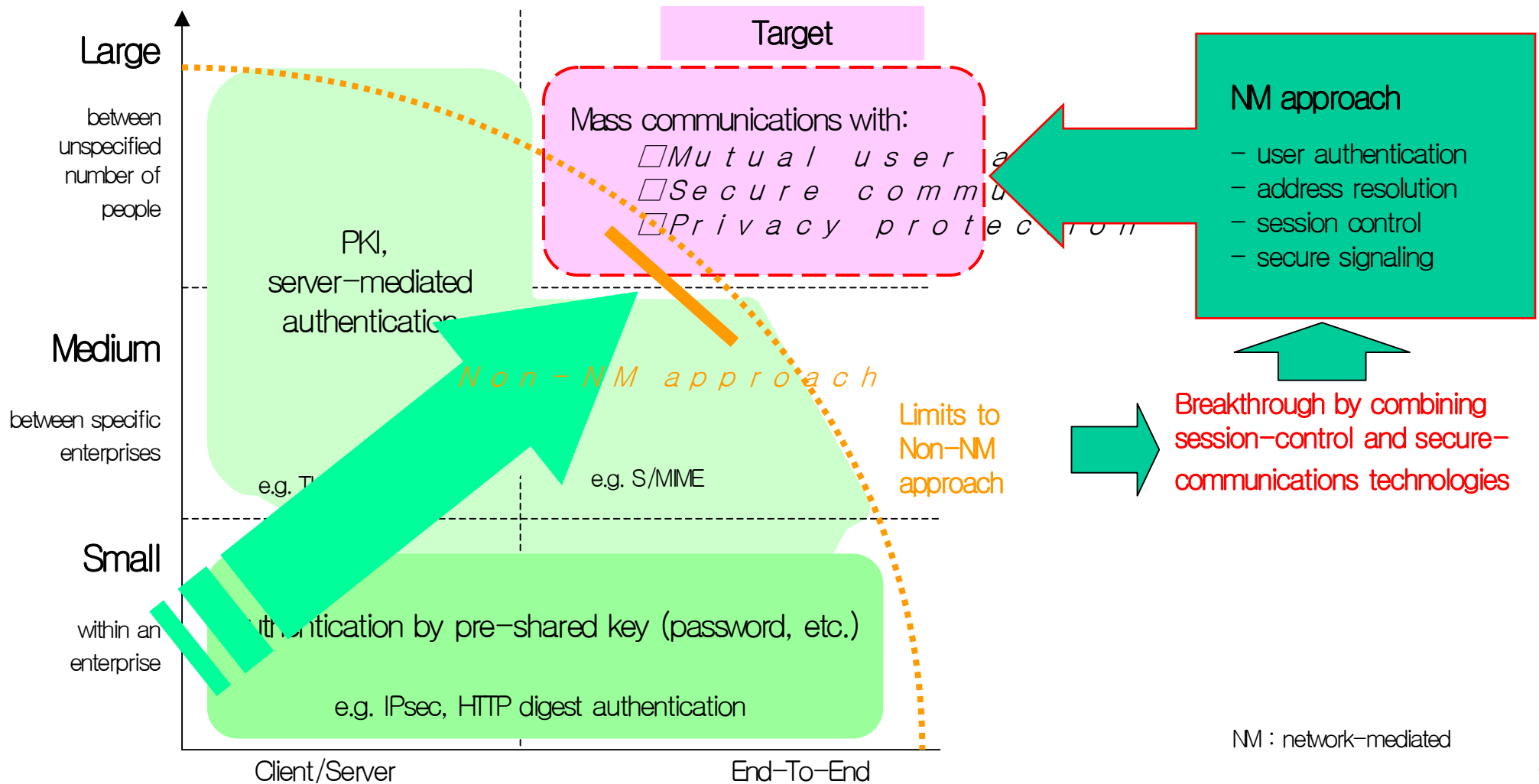
- Variety of QoS
- Security
- End-to-end connectivity
- Scalability
- Openness
- Economy

Outline of network architecture

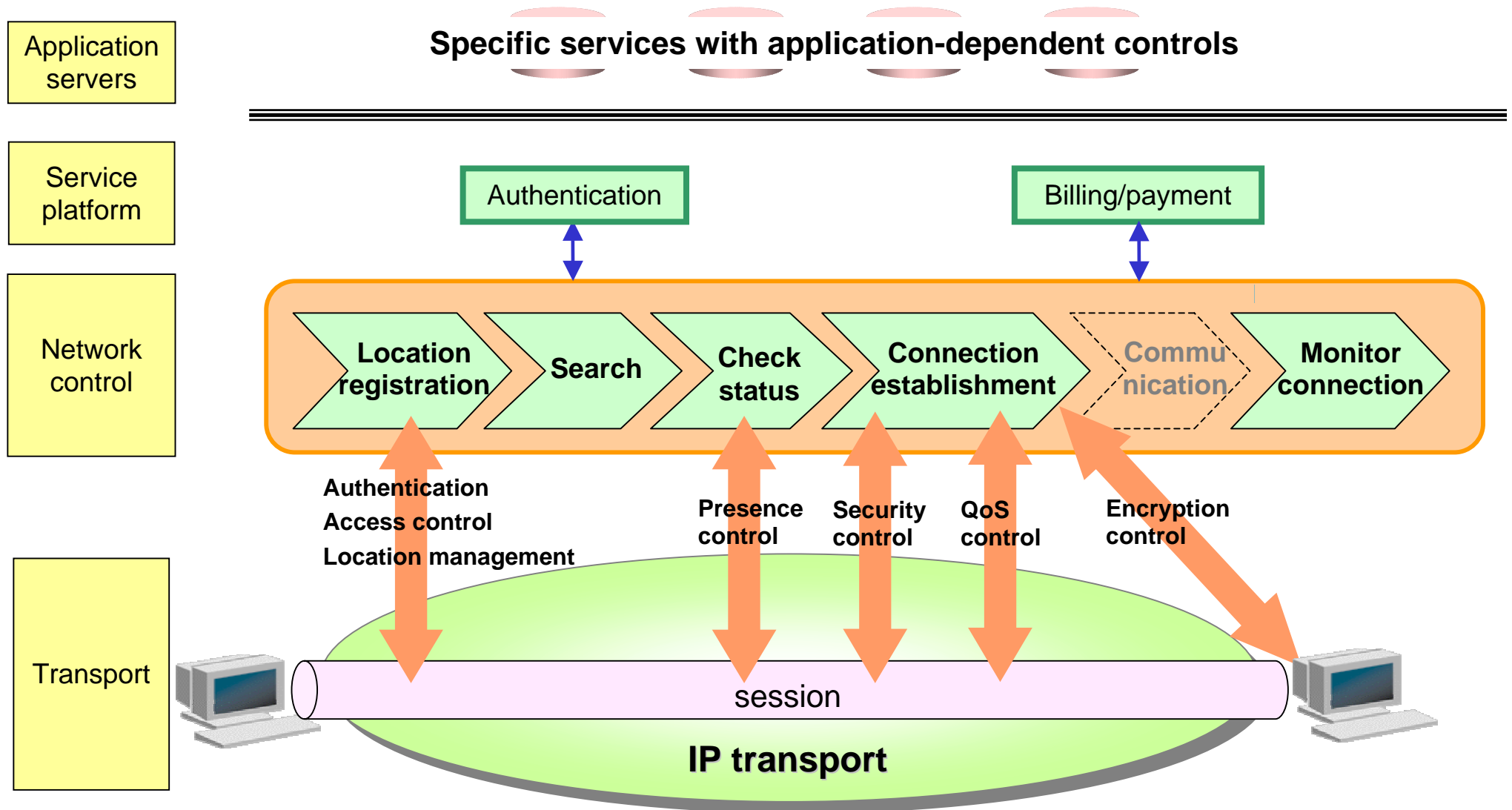


Secure Session Technology ~ A Key to mass communication ~

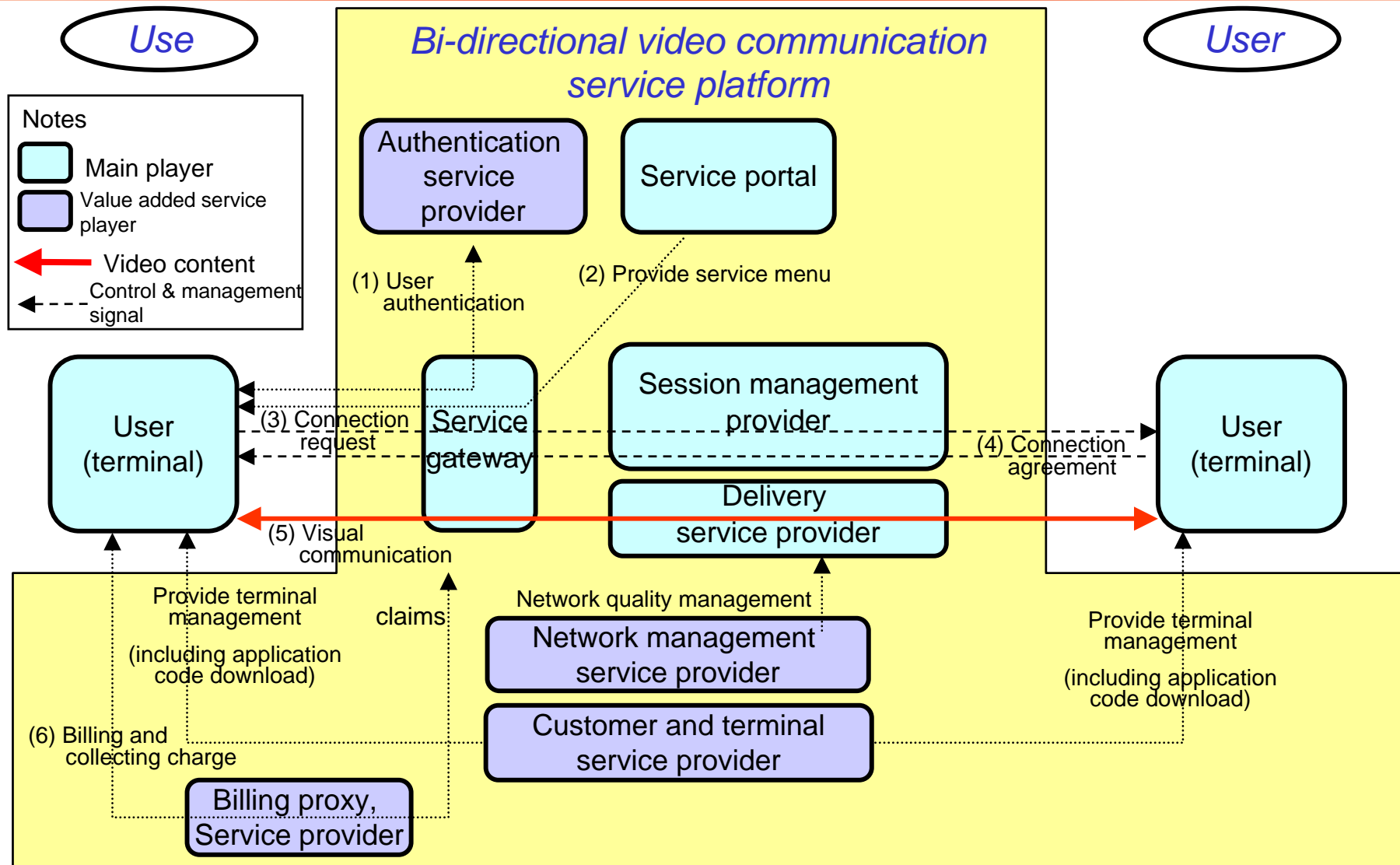
Mass communications between many users will be made possible by secure session technology combining session-control and secure-communications technologies.



Network control associated with communication lifetime



Examples of business player model

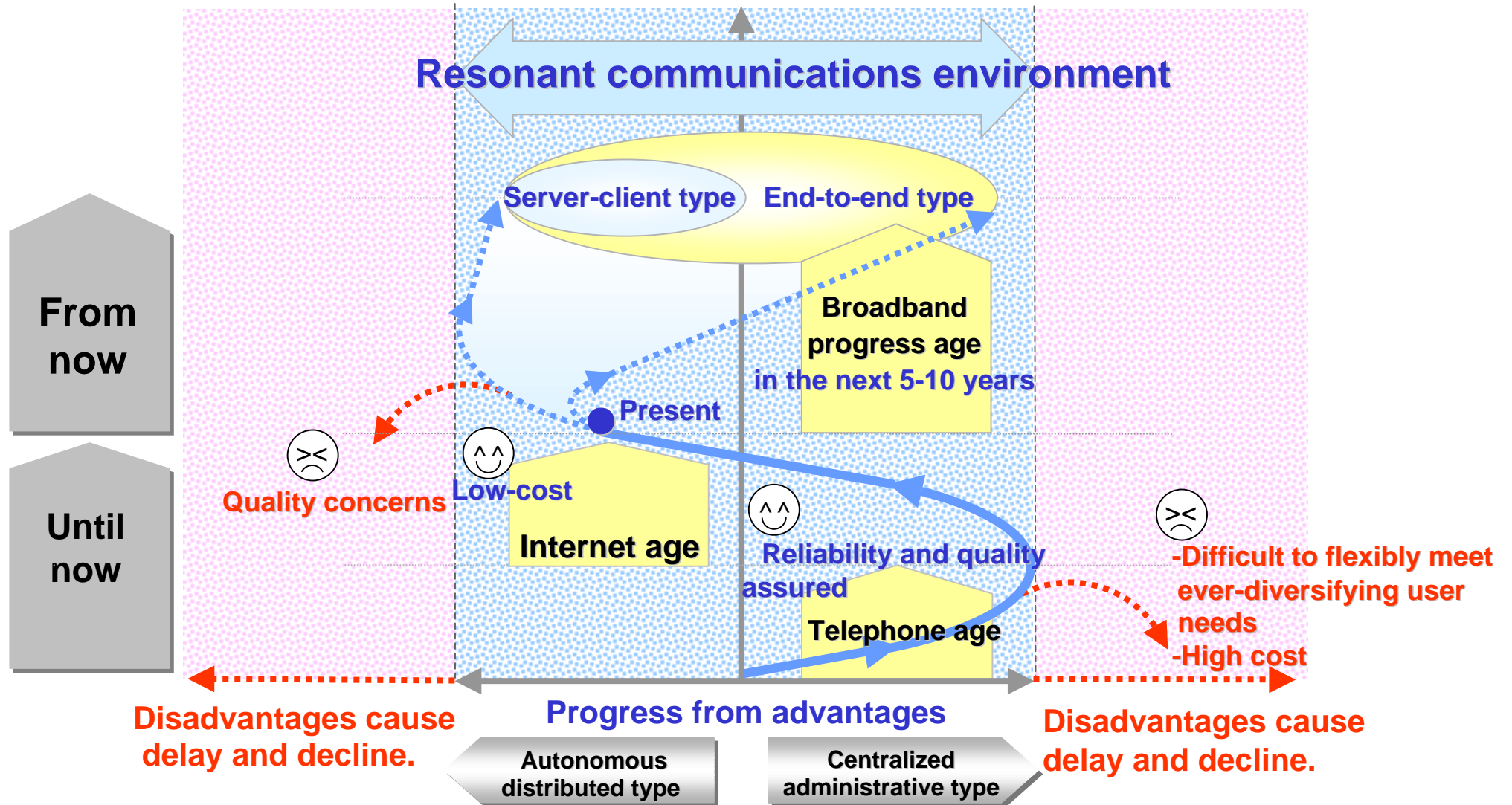


Main Player: Essential player in C2C

Value added service player: Players who provide additional services to main players. They provide outsourcing functions to the main player.

(Source: HSAC)

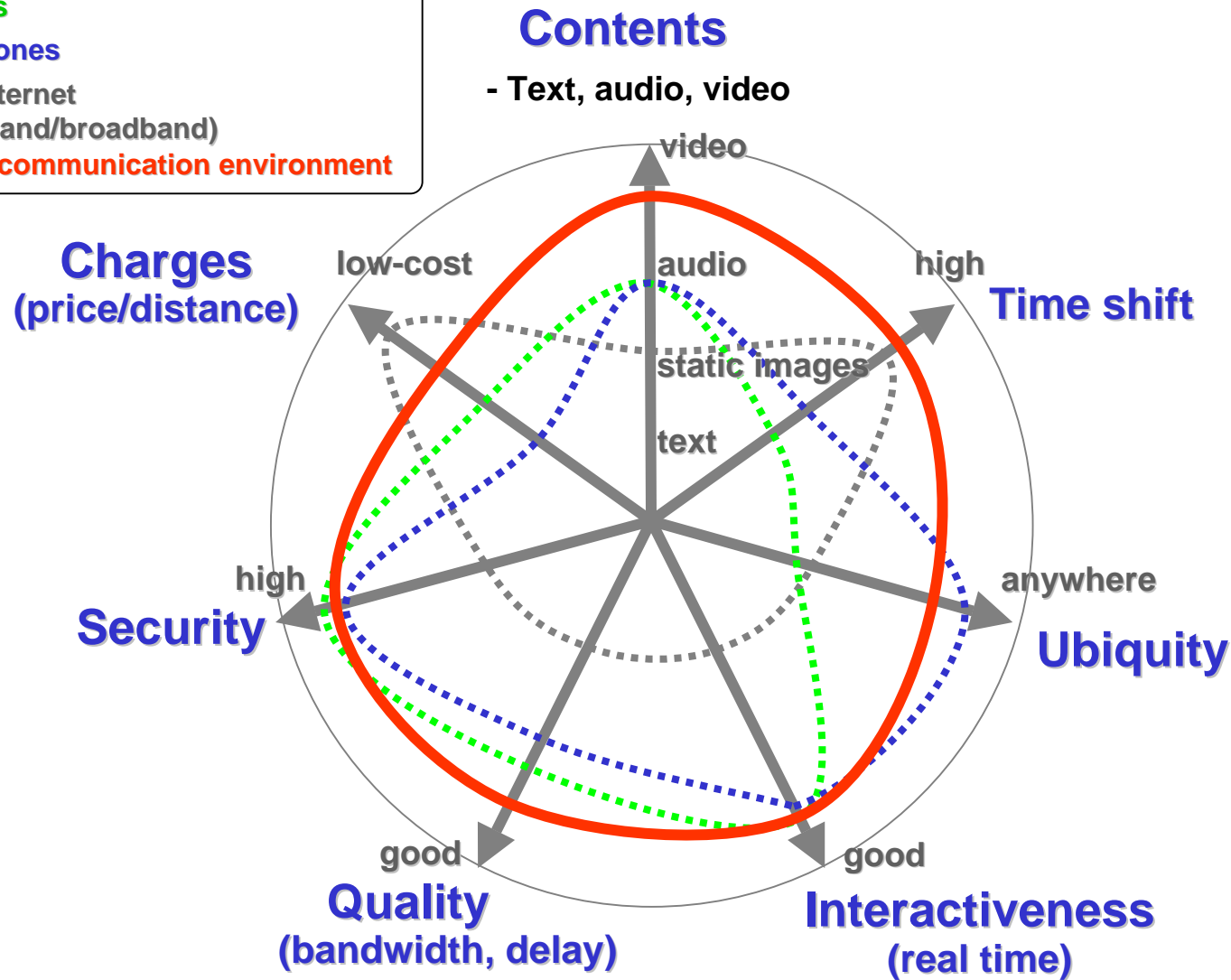
Network evolution toward resonant communication environment



Features of the resonant communication environment

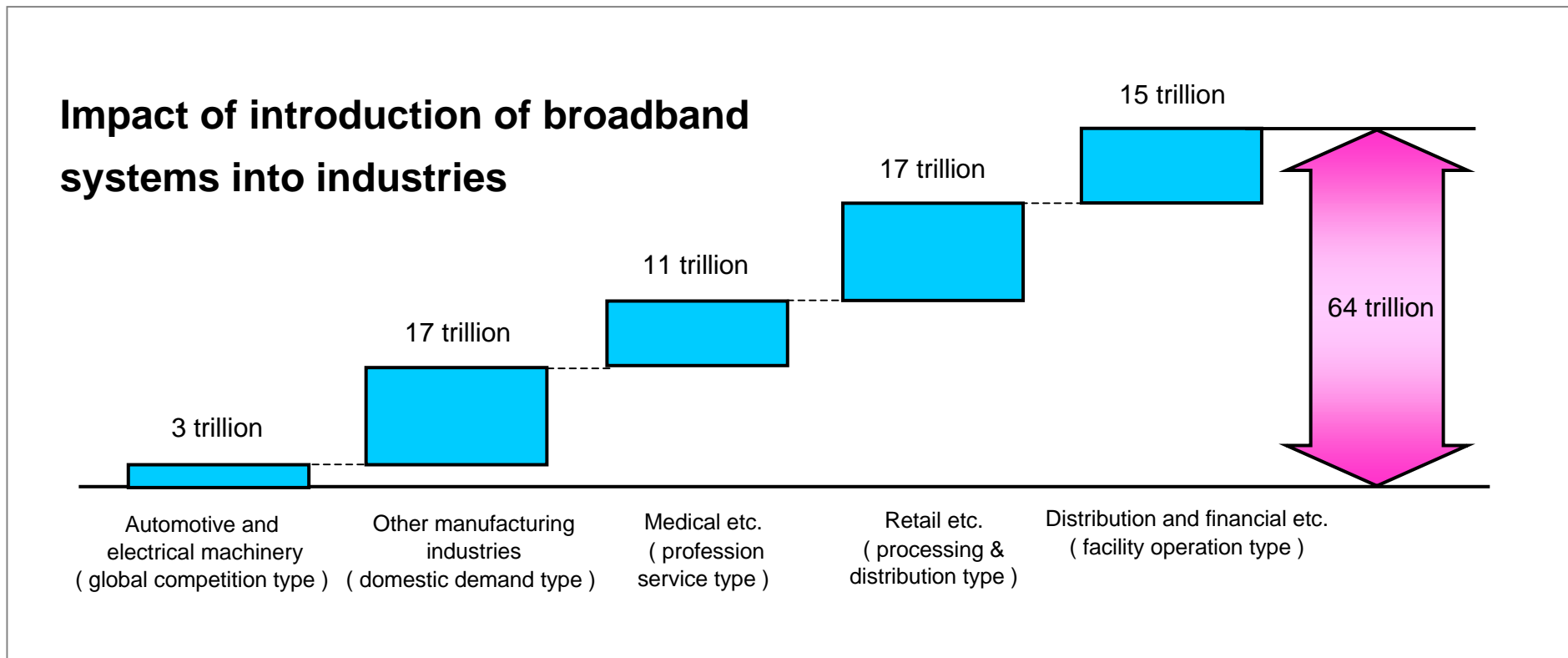
Notes

- ■ ■ Fixed lines
- ■ ■ Mobile phones
- ■ ■ Current Internet (Narrowband/broadband)
- Resonant communication environment



Impact on the Japanese economy

The impact on the Japanese economy is estimated in the range of ¥64 trillion annually by 2007.



(Source: McKinsey & Company, Inc.)

Summary

- ❑ Broadband communication era has started.
- ❑ IP network should grow into an infrastructure, that has high reliability, multiple transfer quality classes, and secure end-to-end connectivity.
- ❑ Session control is one of the key technologies to meet the requirements.
- ❑ These technologies provide “simple”, “safe”, and “smart” connection between end-to-end users, which can create a variety of new businesses.