

Network Infrastructure Change by the Internet

~ Impact on Video Coding ~



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1. Policy Transition

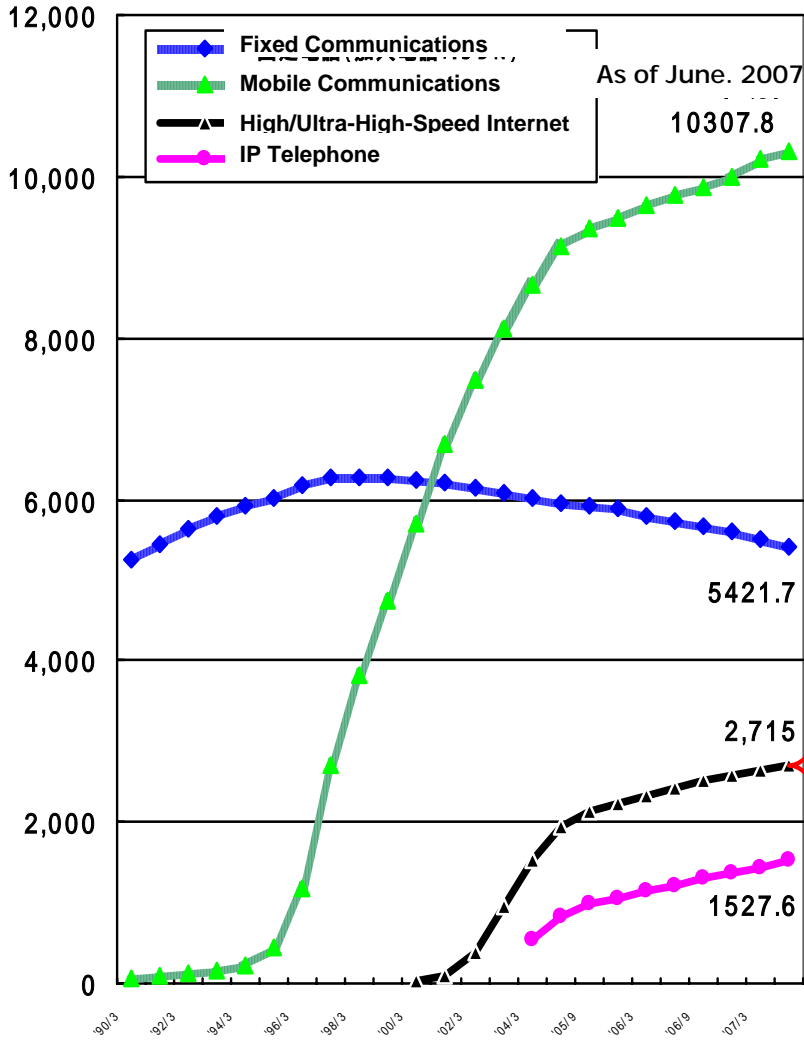
- 1. Japan has introduced competition policy since 1985 as usual.**
- 2. Japan has especially promoted broadband and mobile internet infrastructure.**

Trend in the Number of Japan's Broadband Subscribers

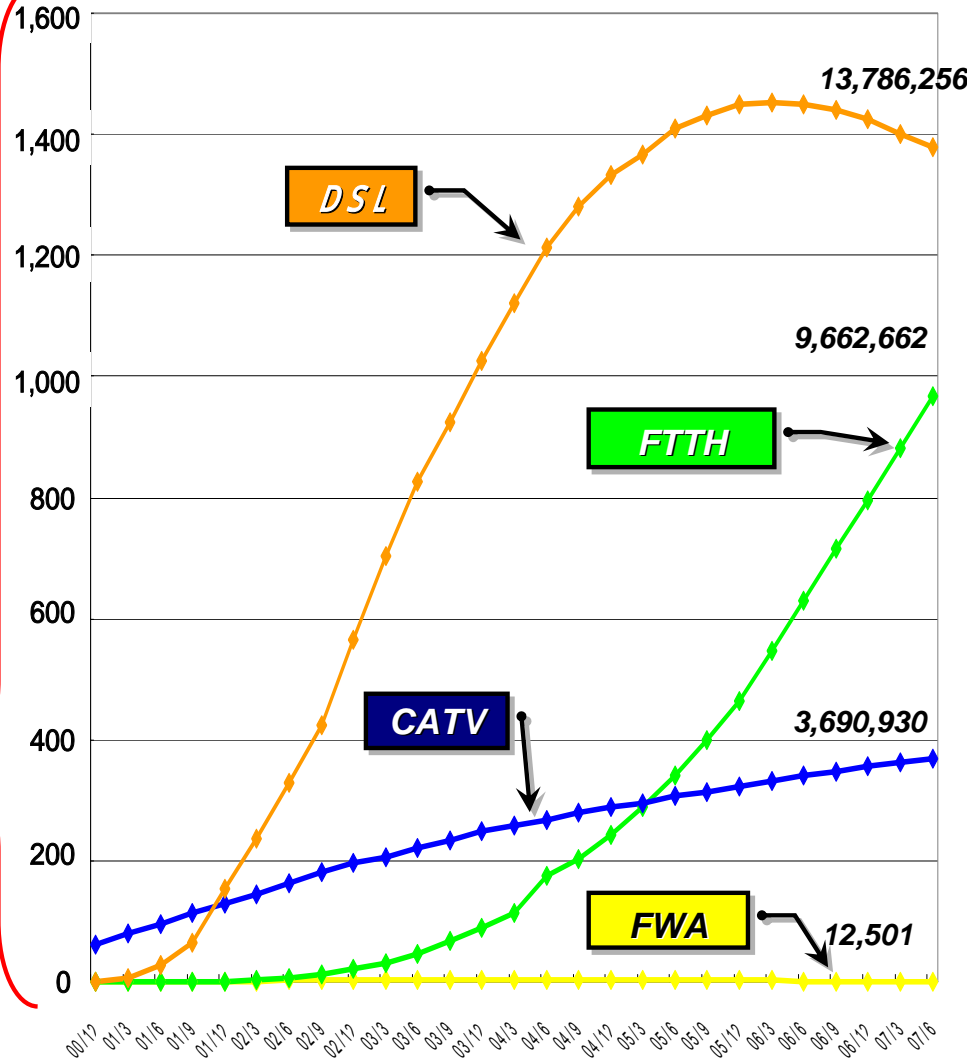
【Telecommunication Service Subscribers】

【High/Ultra-High-Speed Internet Service Subscribers】

(Unit: 10 thousand)

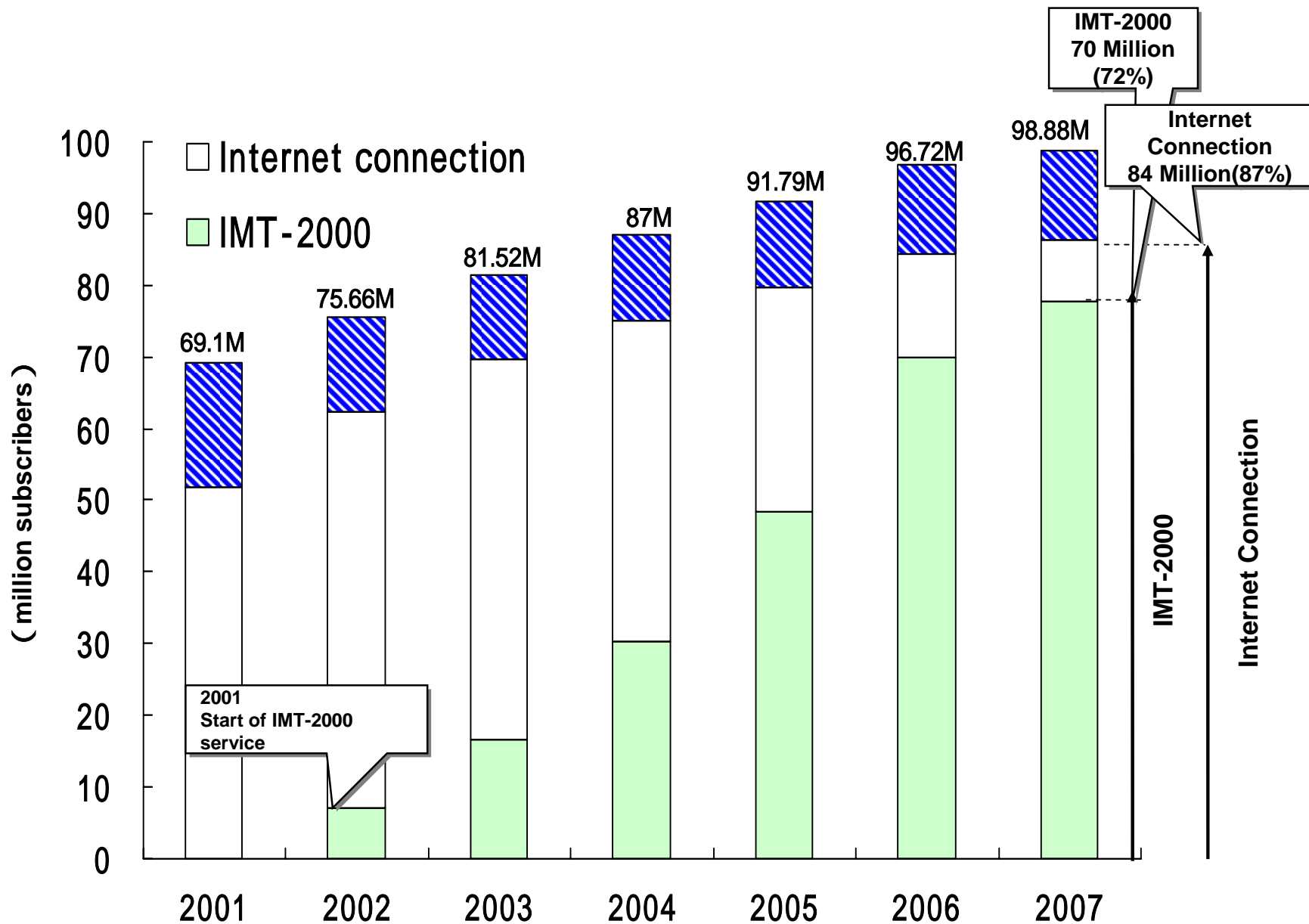


(Unit: 10 thousand)

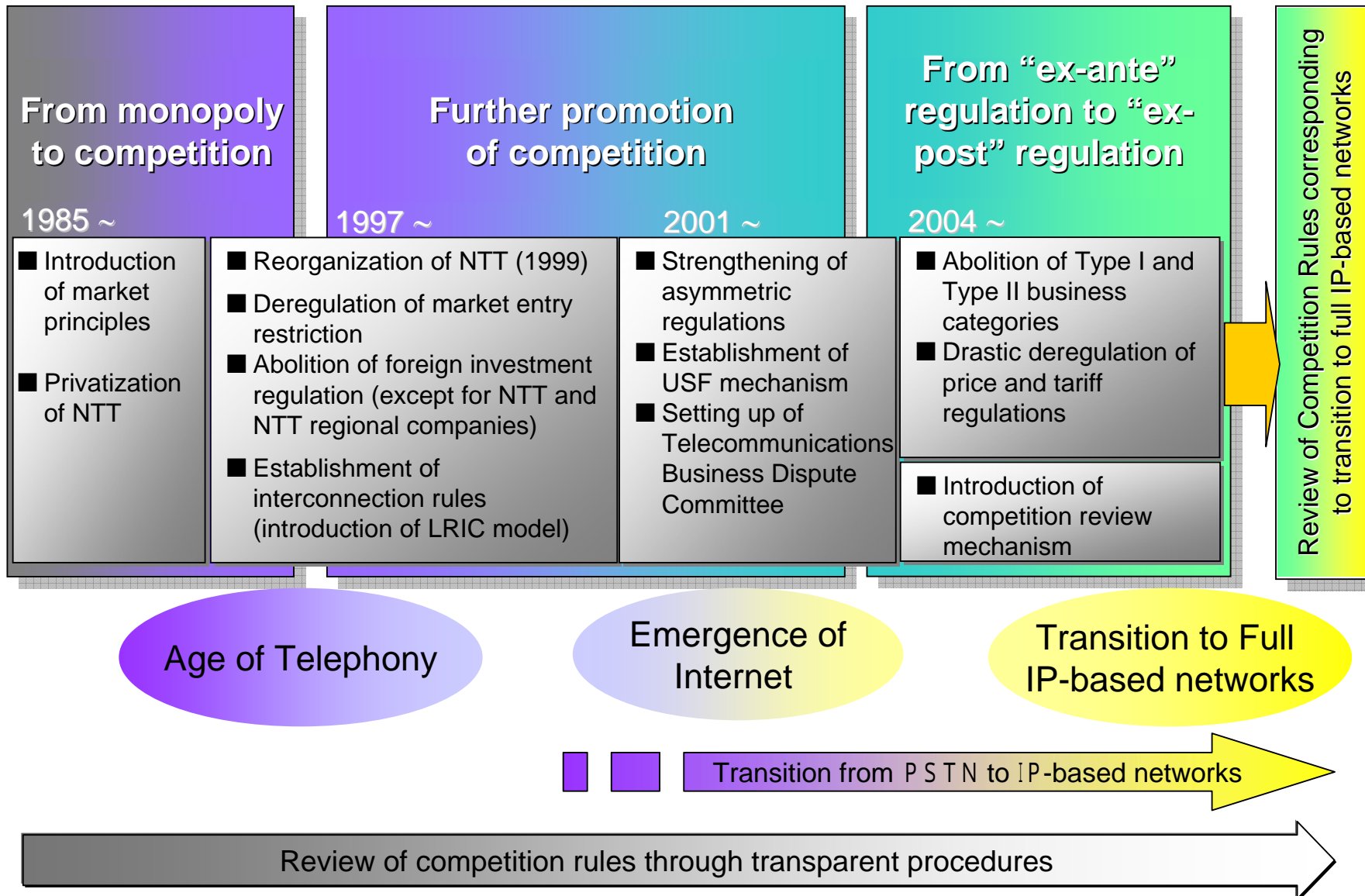


Source: Ministry for Internal Affairs and Communications

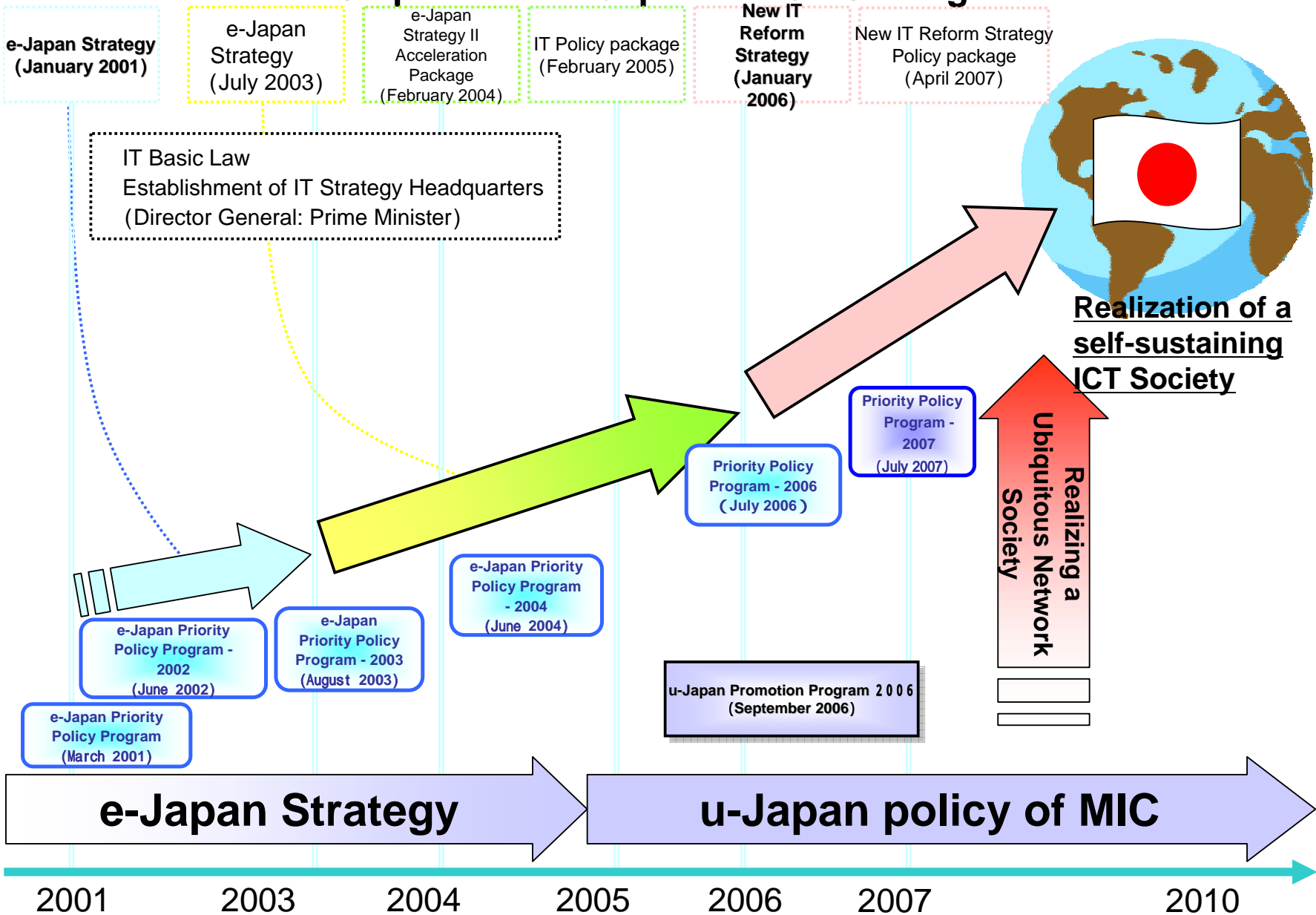
Changes in the number of mobile phone subscribers



Outline of Japanese Telecom Competition Policy



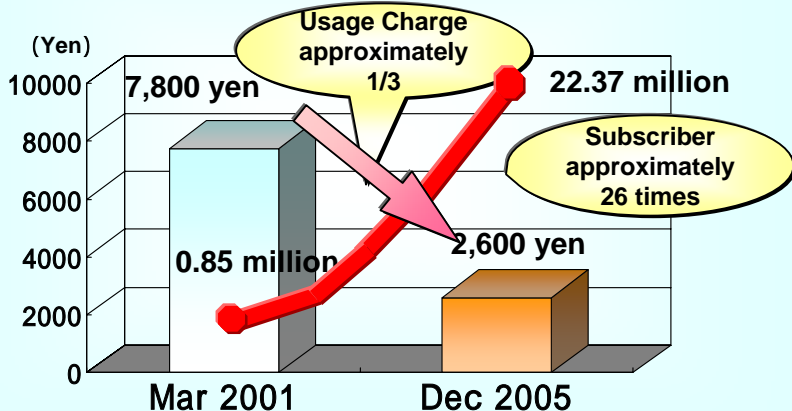
Steps taken in Japan on ICT Strategies



Result of e-Japan Strategy

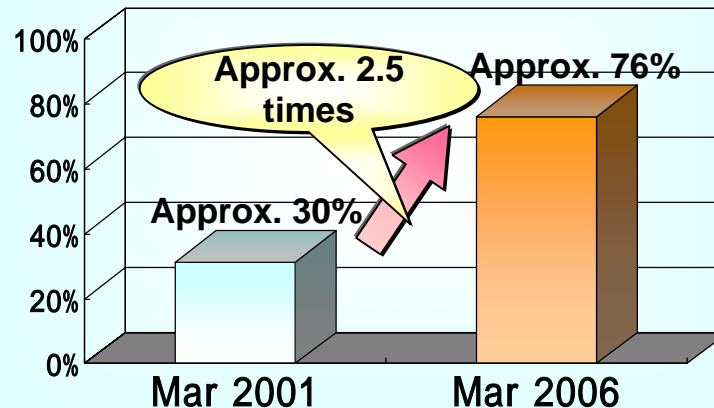
Infrastructure

Usage charge and subscriber of broadband



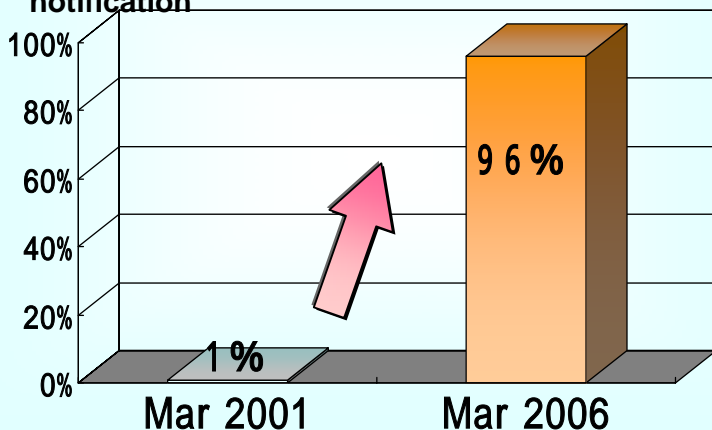
Life · Human resources

Rate of HP publishing in public schools



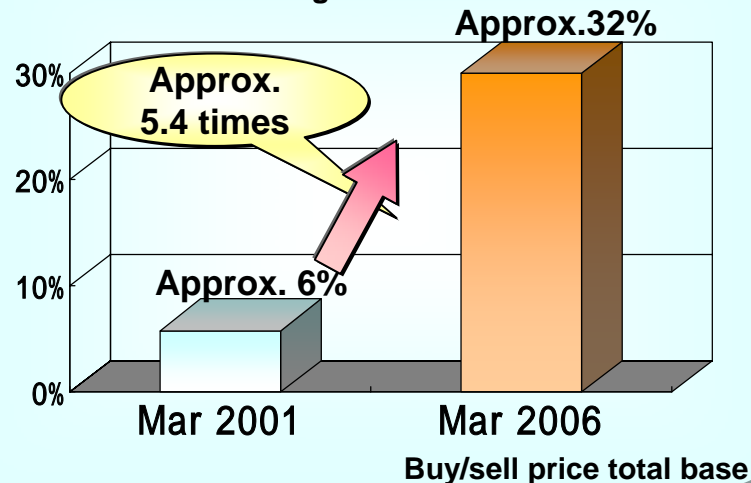
e-Government

Percentage of national procedures that can be performed by electronic application and notification



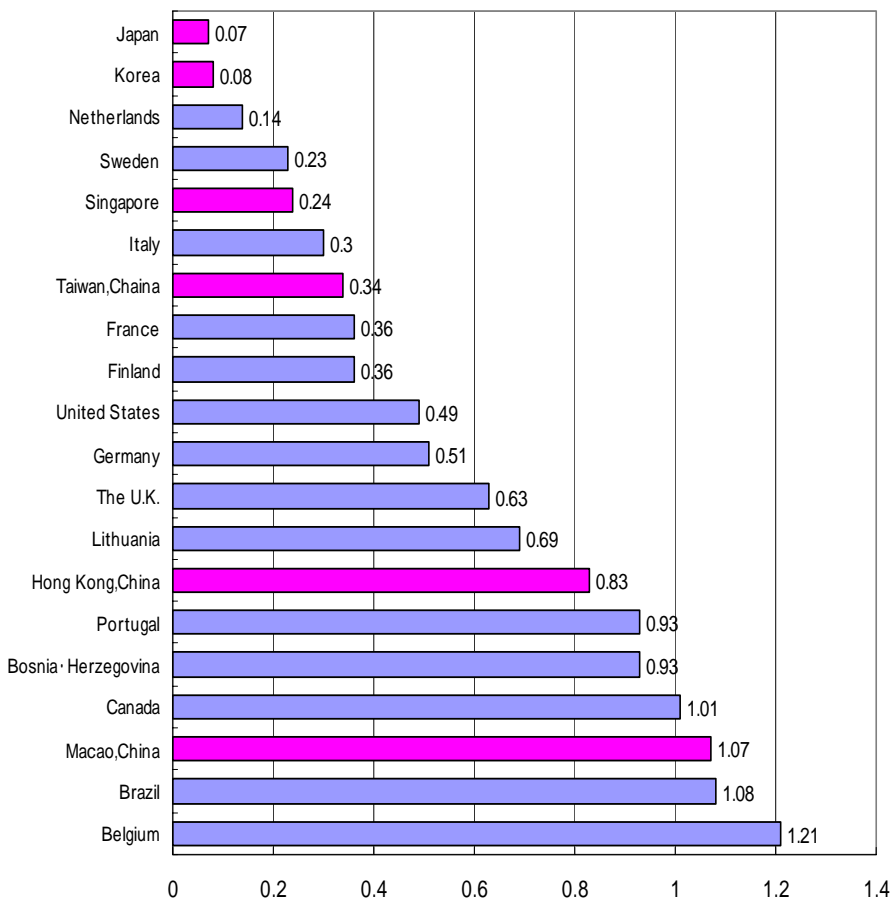
e-Commerce

Internet trading rate on the stock market

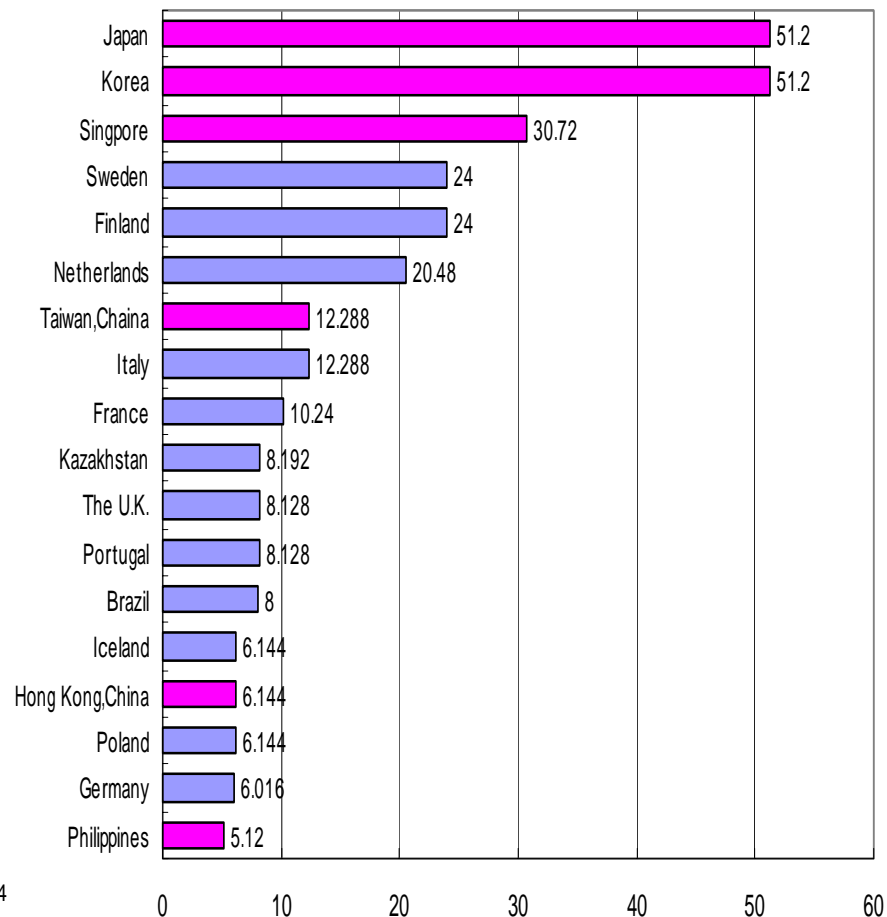


Japanese Broadband Service in Global Comparison

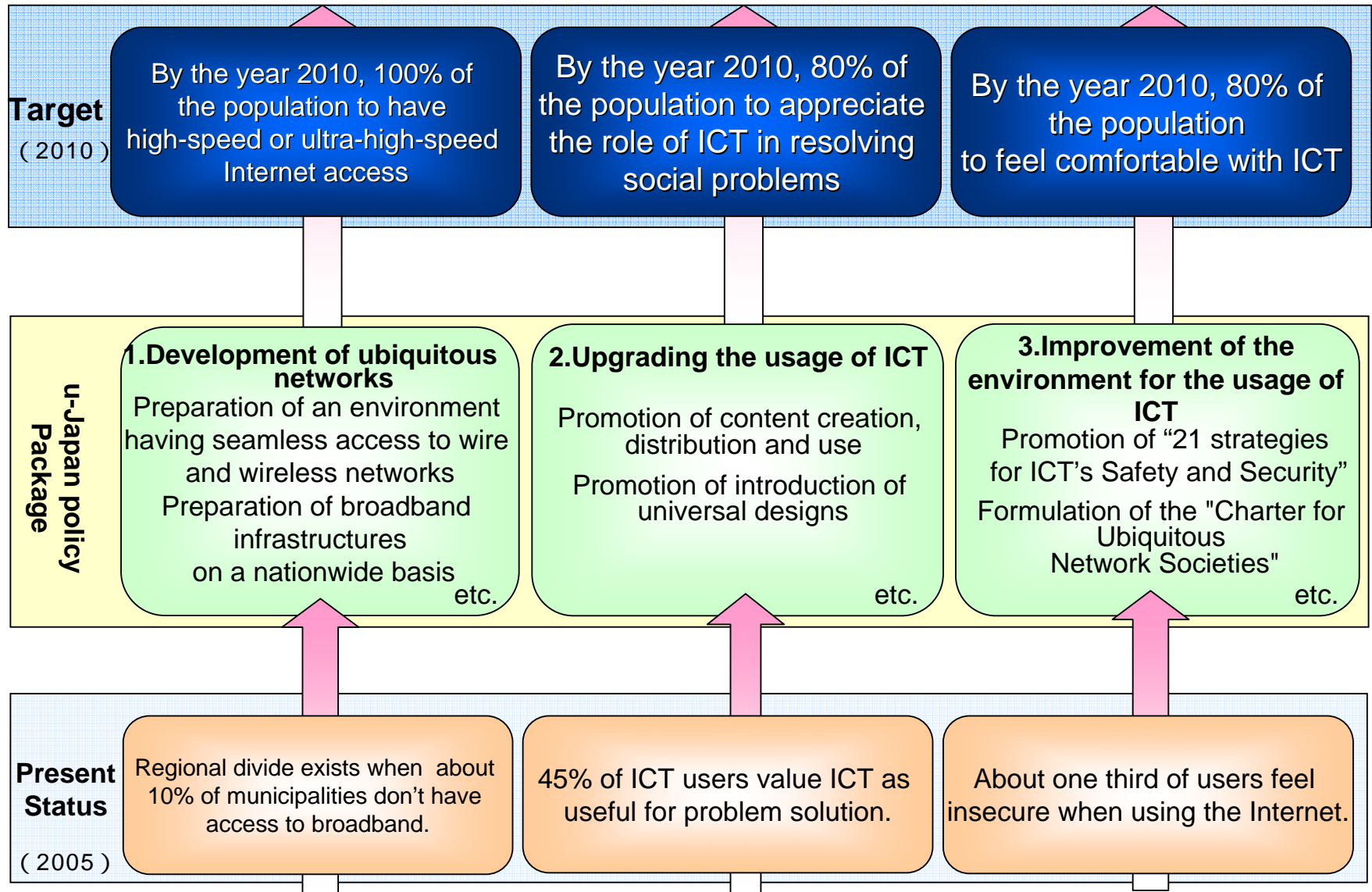
Broadband prices (100kbit/s) (US dollar)



Speed of DSL (Mbit/s)



Summary of u-Japan Policy

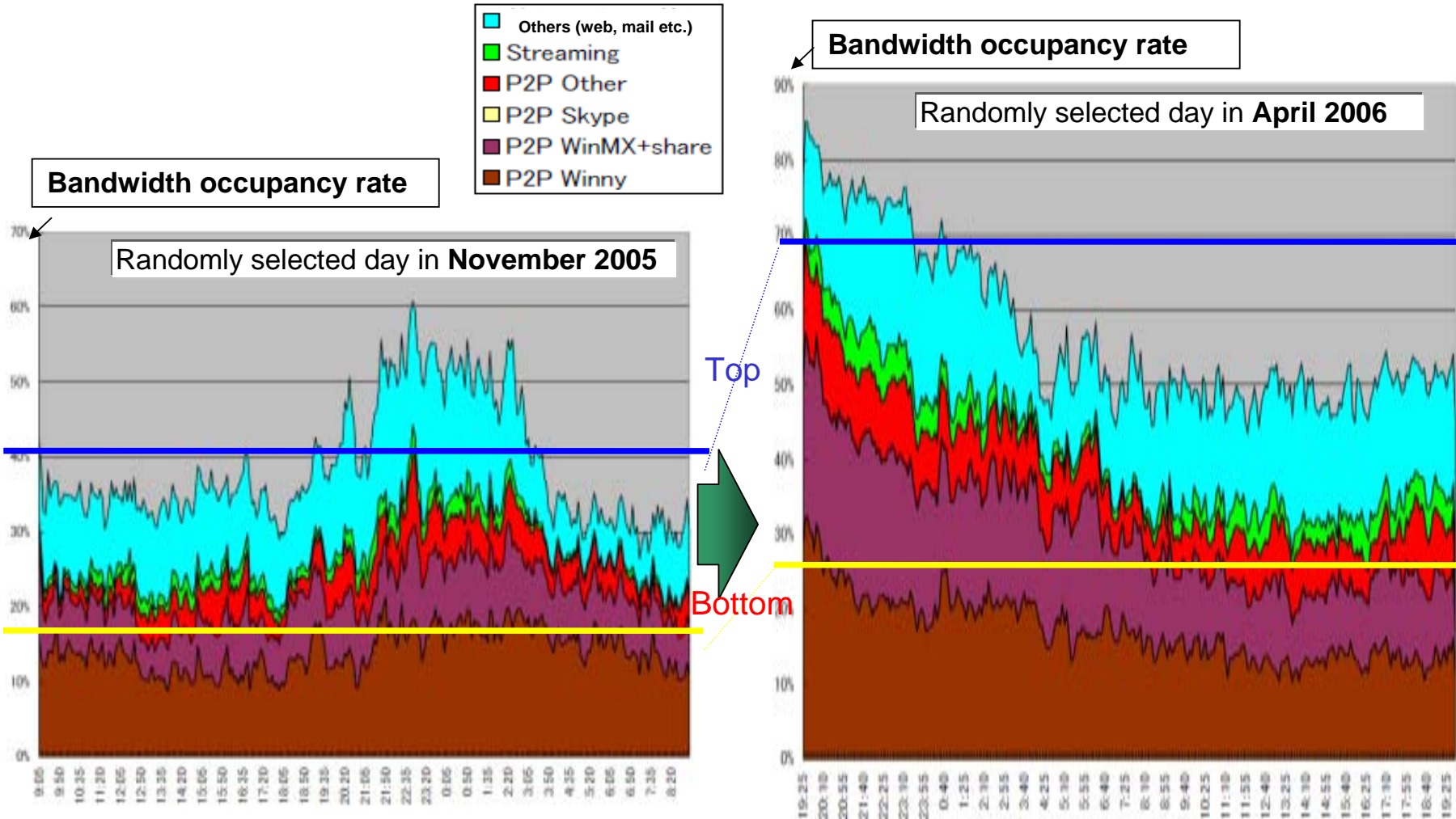


2. Market Change by P2P and Participative Web

- 1. Huge traffic has been generated by P2P video information.**
- 2. Participative Web culture has become popular.**

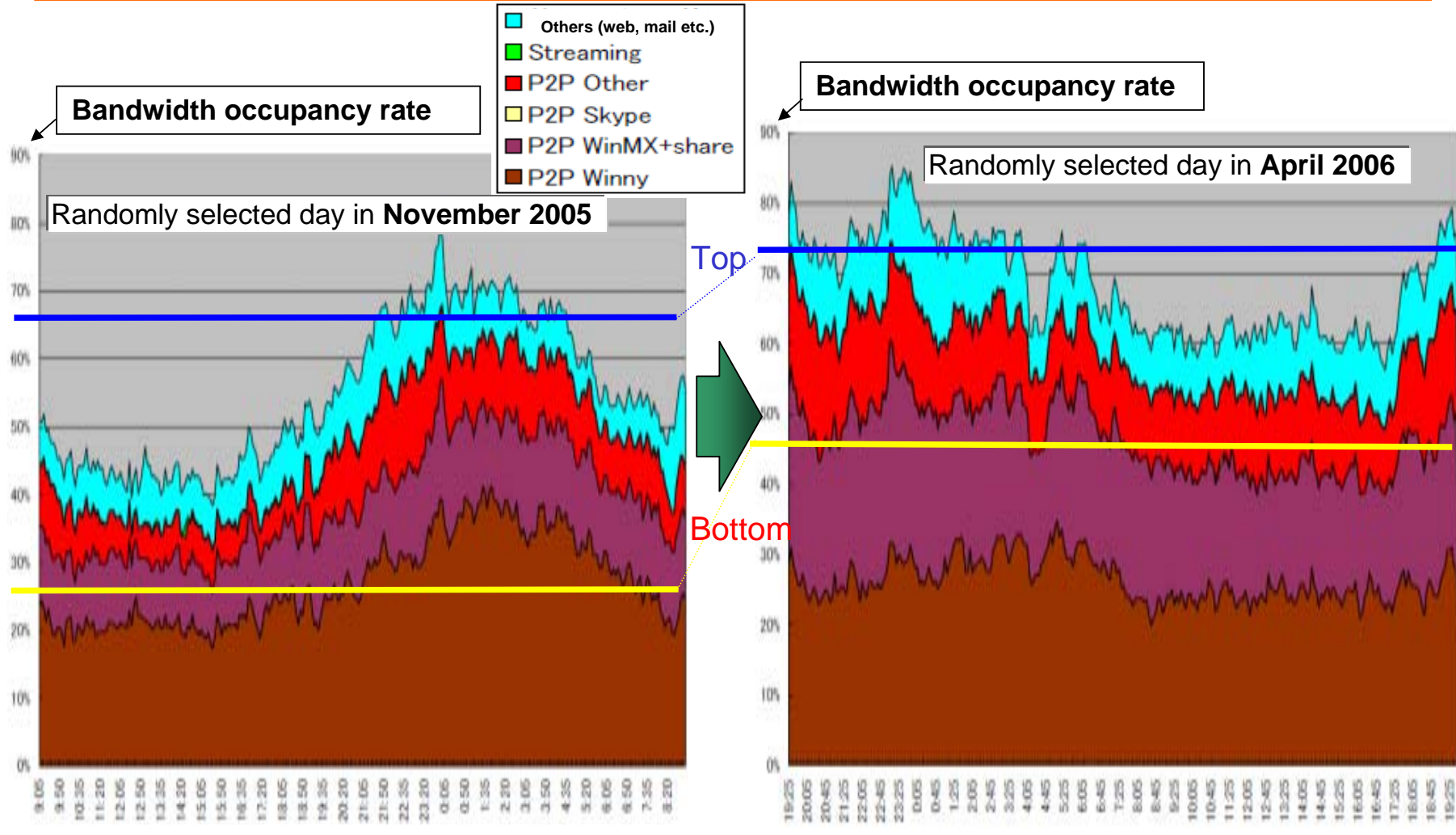
IP Traffic (Downstream)

- P2P traffic has a more significant impact on networks than streaming and web surfing.
- Average P2P occupancy rate increased by 30% at peak level and by 10% at off-peak level over the six-month period.



IP Traffic (Upstream)

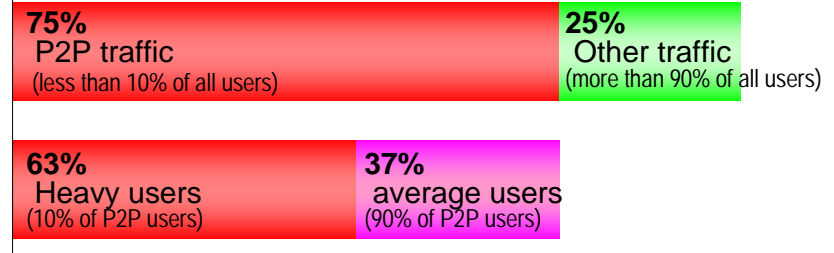
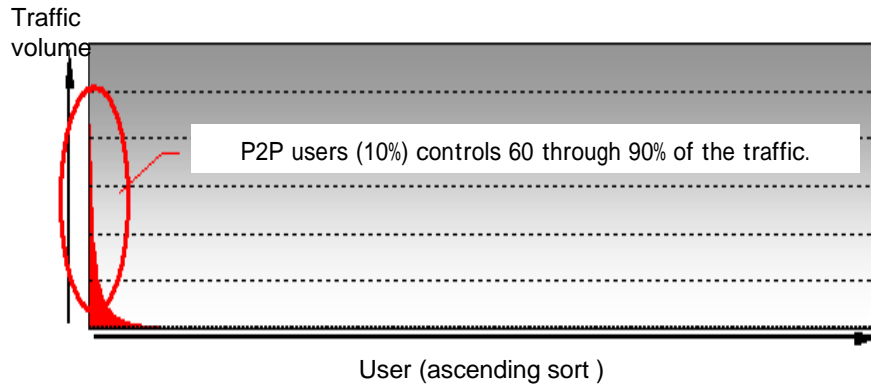
- P2P occupancy rate is higher in upstream than in downstream.
- P2P traffic occupied no less than approx.50% throughout 24h in Apr.2006.



Bandwidth Usage and P2P Users

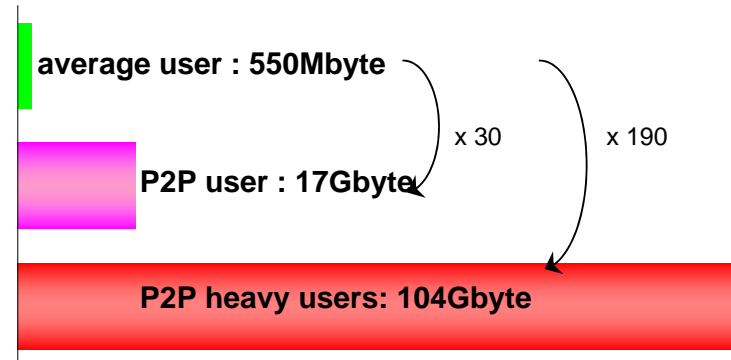
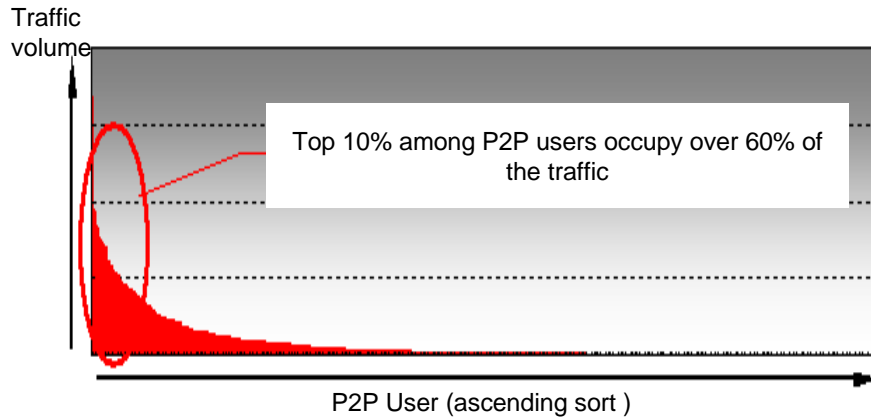
10% of all users occupy 60 through 90% of the traffic

Distribution of users in all traffic



Top 10% of P2P users(*) occupy more than 60% of the traffic

Bandwidth used by heavy users completely differs from that used by average users.



Measured : 2003/6/30 – 2003/7/1 11:59

(*) "the P2P users" are considered as the users whose P2P traffic exceeds over 1 Mbyte within 24 hrs.

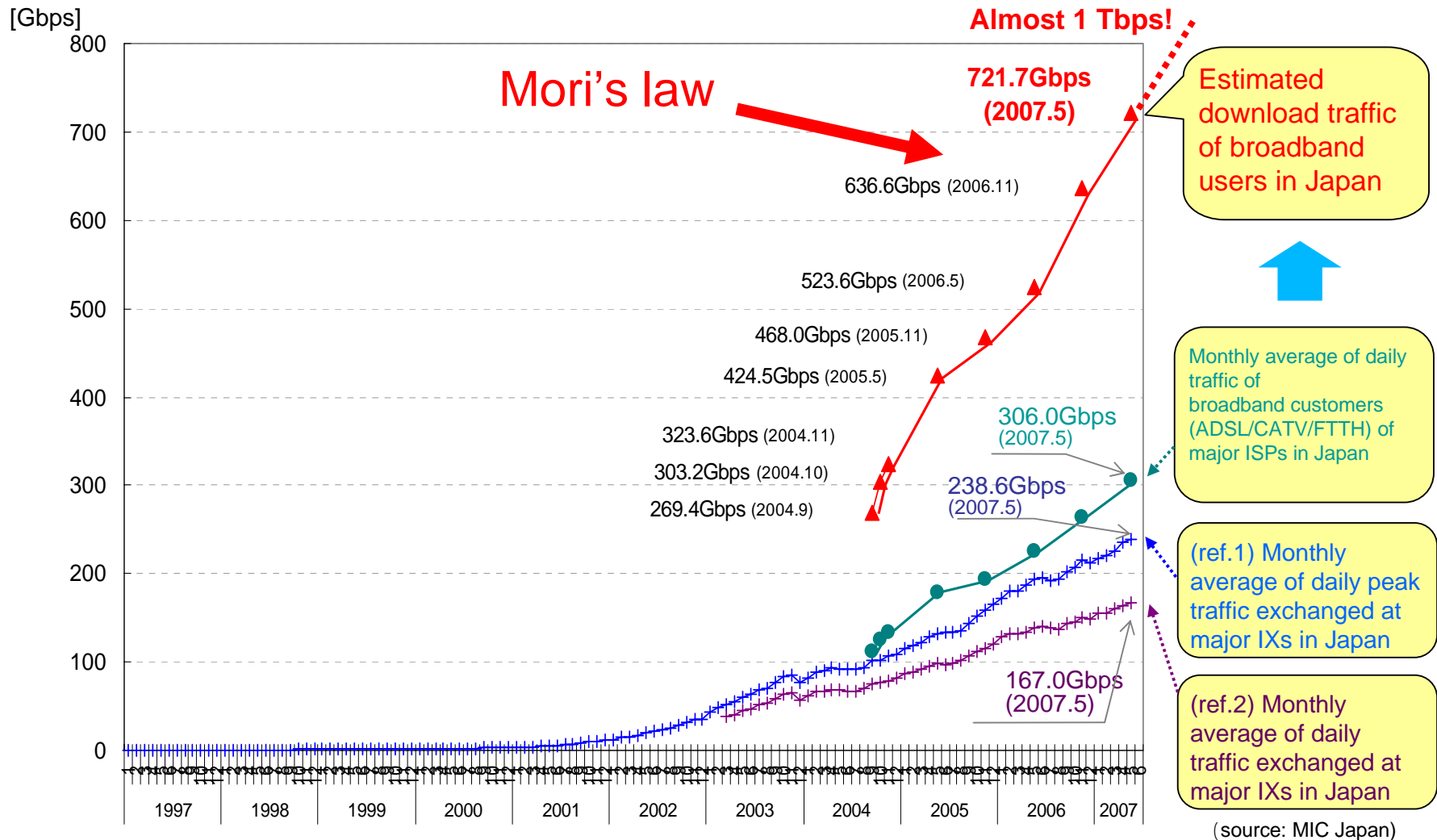
(*) the Plala Networks has controlled its P2P bandwidth since November 2003, therefore the latest published data in uncontrolled situation is for 2003.

(Note) The data was provided by Plala Networks) (partly extracted)

Source: Ministry for Internal Affairs and Communications

IP Traffic on the Networks (Total Volume)

- The total amount of IP traffic in Japan was estimated at 721.7Gbps (May 2007), which accounts for about 1.4 times more than that of the previous year (523.6Gbps).
- Necessity for enhancing network capacity is increasing.



Dr.Gordon.E.Moore has recognized Mori's law.

Only Japan has the real data about the broadband traffic growth curve as the strong leadership by the previous Vice-Minister for Internal Affairs and Communications ,Mr. Kiyoshi Mori.

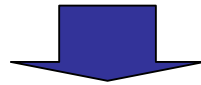


May1,2008 at Keck Observatory

Participative Web's Impact

Impacts of Participative Web

- 1 . Web2.0 type trend for New Culture
- 2 . Business Models Changes
- 3 . Increase Traffic



Necessary for new legislative Approaches

Action Items for the Participative Web

- 1 . Copyright Issues
- 2 . Cost Management for Traffic Increase
- 3 . Create New Industry

Equitable Cost Allocation of Networks

**Easing Network Congestion by Making Active Use of P2P
Development of Guidelines Regarding Packet Shaping**

Equitable Access to Networks

**Development of Interconnection Rules Regarding NGN
Review of Dominant Regulations**

etc.

(Reference: Network Neutrality Principles)

IP-based networks should be accessible to users and easy to use, allowing ready access to content and application layers.

IP-based networks should be accessible and available to any terminal that meets the relevant technical standards, and should support terminal-to-terminal (or “end-to-end”) communication.

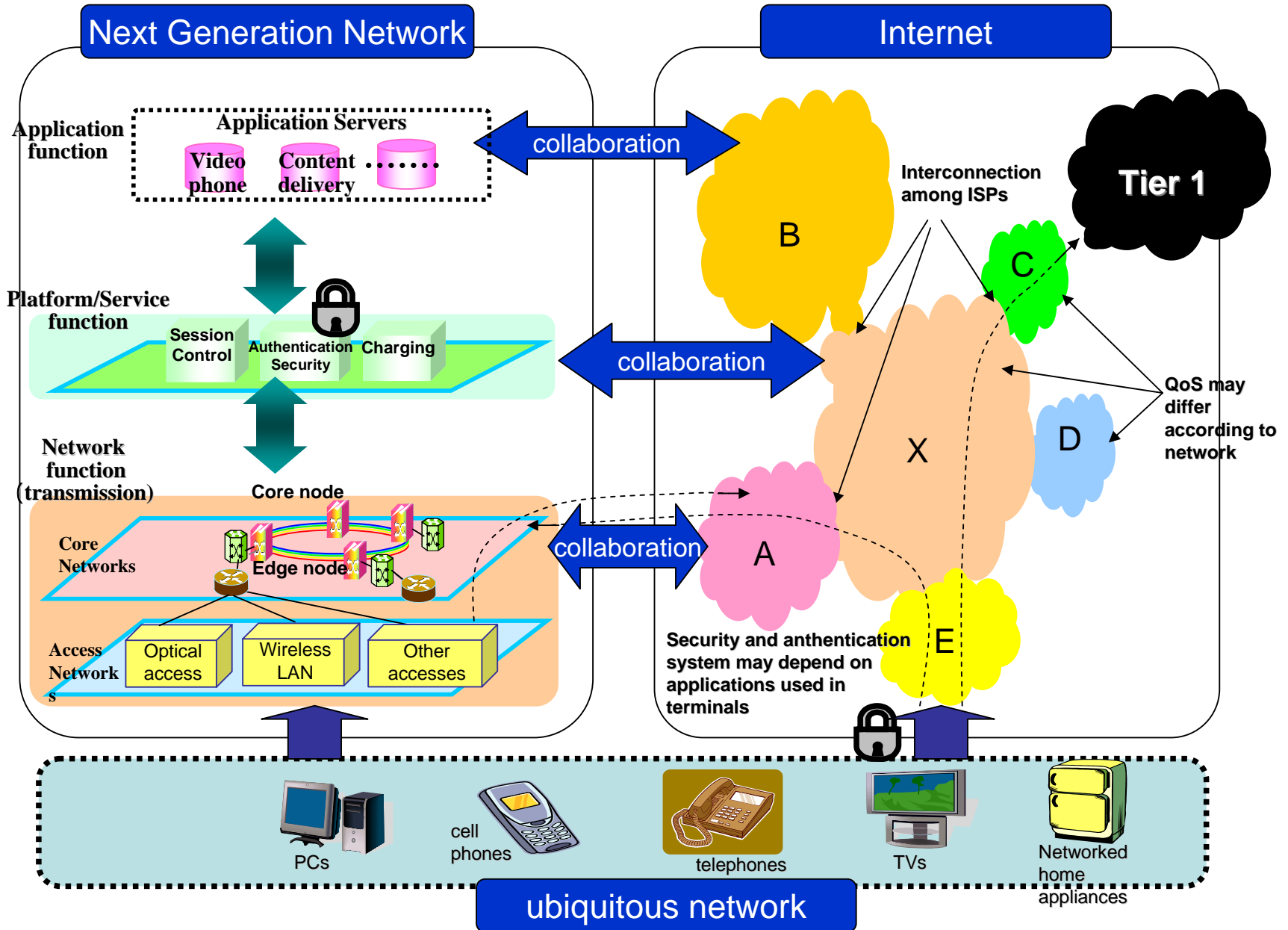
Users should be provided with equality of access to telecommunications and platform layers at a reasonable price.

Note: In this case, "the user" refers not just to end users but also includes content providers and other related companies that conduct business using IP networks.

3. Vision of Future Network for Video Communication

1. Convergence between Broadcasting and Communications by IP-Network.
2. Wireless Broadband Networks are coming soon.
3. Guaranteed Broadband Network will take off.

Freedom to Choose Networks



Vision of Future Network for Video Communications

1. HDTV based Full Digital Broadcasting from 2011.
2. HDTV based IPTV is coming soon.
3. HDTV Based P2P communication is coming soon.
4. The 4K Based Professional Communications become popular soon.
5. 100Mbps Mobile Communications become popular soon.
6. 1Gbps Mobile Communications emerges in 2015.