Japan's Collaborative Endeavor to overcome IPv4 Address Exhaustion

Task Force on IPv4 Address Exhaustion, Japan

http://kokatsu.jp/en/

July 2009

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- Task Force on IPv4 Address Exhaustion, Japan
- Activities within and out of the TF

Studies and Activities before the Task Force

Reports on IPv4 Address Exhaustion

- JPNIC (Dec 2007) and MIC (June 2008) as separate studies
  - Japanese
    - JPNIC - http://www.nic.ad.jp/ja/ip/ipv4pool/ipv4exh-report-071207.pdf
    - MIC - http://www.soumu.go.jp/s-news/2008/pdf/080617_2_bt1.pdf
  - English
    - JPNIC - http://www.nic.ad.jp/en/research/IPv4exhaustion_trans-pub.pdf
    - MIC(full paper) - http://www.soumu.go.jp/joho_tsusin/eng/pdf/080617_1.pdf
    - MIC(summary slides) - http://www.soumu.go.jp/joho_tsusin/eng/pdf/080617_2.pdf

Reports on IPv4 Address Exhaustion

- Both reports reached a similar conclusion as the results of analyses
  - Analysis of situation surrounding IPv4 exhaustion
  - Issues listed, possible solutions and issues for each solution
  - <u>Concluded that IPv6 is the only effective long-term solution after IPv4 address exhaustion</u>
- MIC report makes further analysis on action plan broken down by categories of stakeholders

Activities by other bodies

- IAjapan Internet Association Japan
  - Consider formations for collaboration with other bodies its Commitee
- IPv6 Promotion Council
  - Listing issues in IPv4/IPv6 Coexisting environment in its WG
- JAIPA Japan Internet Provider Association
  - Proposing & negotiating with NTT to support IPv6 in its FLETS service (which provides connection lines infra for ISPs)
- JANOG
  - Topics handling IPv4 exhaustion/IPv6 transfer discussed in every meeting since JANOG18 (July 2006)
- DISTIX Distributed IX Project)
  - Working on technical issues in DNS/Translators in its WG
- JPNIC
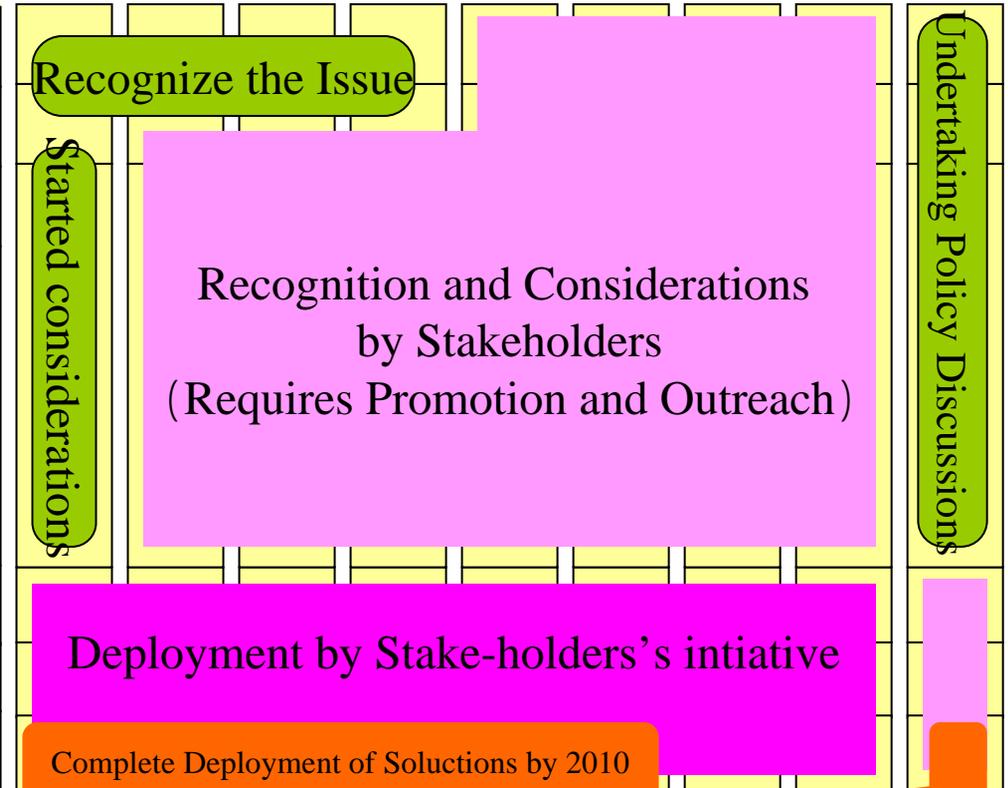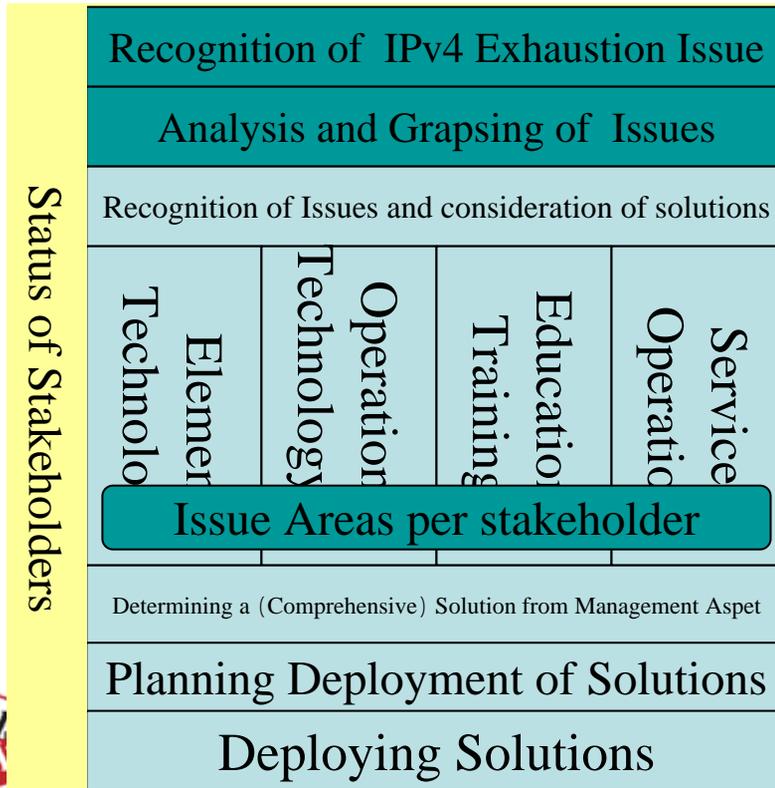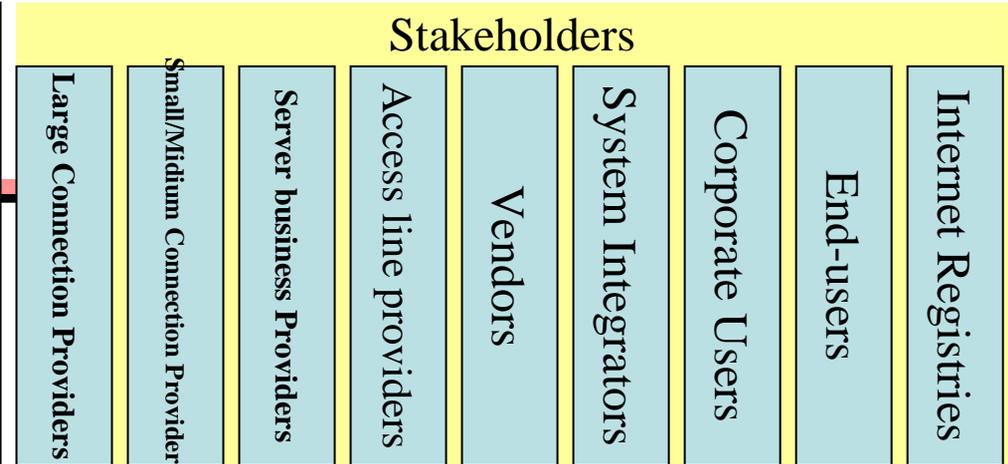 - Set up a website specialized to publish information related to IPv4 exhaustion

Information on IPv4 Address
JPNIC Exhaustion Issue

The major problems identified

Stakeholders and their status

Area with awareness/progress by stakeholders

Areas where there is still no awareness by stakeholders

Stakeholders

- Large Connection Providers
- Small/Midium Connection Providers
- Server business Providers
- Access line providers
- Vendors
- System Integrators
- Corporate Users
- End-users
- Internet Registries

Status of Stakeholders

Recognition of IPv4 Exhaustion Issue

Analysis and Grapsing of Issues

Recognition of Issues and consideration of solutions

- Element Technolo
- Operation Technology
- Operation Technology
- Education Training
- Service Operatio

Issue Areas per stakeholder

Determining a Comprehensive Solution from Management Aspet

Planning Deployment of Solutions

Deploying Solutions

Recognize the Issue

Started considerations

Recognition and Considerations by Stakeholders
Requires Promotion and Outreach

Undertaking Policy Discussions

Deployment by Stake-holders's intiative

Complete Deployment of Soluctions by 2010

Stakeholders and their remaining issues

Spread/Area with Issues

Details of the Isssues

Stakeholders

Large Connection Provi...

Small/Medium Connection Pro...

Server business Provid...

Access line provid...

Vendors

System Integrato...

Corporate Users

End-users

Internet Registries

Outreach channel unfixed

Solutions incomplete for IPv6 technical issues

Solutions incomplete for IPv4-IPv6 inter-connections

Early fix of Specifications needed

IPv6 deployment unconfirmed in access line

Difficult to consider solution on their own

IPv6 support insufficient for firewalls and VPNs

Needs/ technologies remain uncertain

information sharing insufficient

Issue Areas per stakehold...

Determining a Comprehensive Solution from Management Aspet

Planning Deployment of Solutions

Deploying Solutions

Need solid progress to complete deployment by 2010

The major problems

- Although there is higher awareness by major operators on personal level…
  - IPv6 Deployment requires additional cost in short term, which is difficult to justify
  - Little real-life deployment experience in IPv6 and no sufficient expertise by vendors
  - Technology for interworking between IPv4 and IPv6 is inevitable during the transition phase, but no technology at production level so far
- Service providers and venders are watching and waiting to see each others to take action
- A collaborated activity is necessary as a break through from such a *"watching to see what the others will do"* state

Task Force on IPv4 Address Exhaustion, Japan

Synchronized action toward the the exhaustion

- Set up a TF to make coordinated actions among all stakeholder groups

- <u>Task Force on IPv4 Address Exhaustion, Japan</u> launched in Sept. 2008

  - <u>http://kokatsu.jp/</u>
  - Members: Various associations from Telco and Internet industries, and the Ministry concerned

Charter – the taskforce

- Formulating a taskforce to synchronize the activities by various associations

- to overcome the crisis of the IPv4 address exhaustion in a coordinated manner

- In four aspects of
  - Solution of the issues – technique, operation and management

  - Enlightenment and publicity

  - Education

  - Progress management

Members – the taskforce (1/2)

- Internet Associations
    - IPv6 Promotion Council, Japan   http://v6pc.jp/
    - Internet Association of Japan (IAjapan)   http://www.iajapan.org/
    - Distributed IX Project   http://www.distix.net/
    - Japan Internet Providers Association   http://www.jaipa.or.jp/
    - JPCERT Coordination Center   http://www.jpcert.or.jp/
    - Japan Network Information Center (JPNIC)   http://www.nic.ad.jp/
    - Japan Network Operators' Group (JANOG)   http://www.janog.gr.jp/
    - Japan Network Security Association (JNSA)   http://www.jnsa.org/
    - Japan UNIX Users Society (jus)   http://www.jus.or.jp/
    - Japan Registry Services (JPRS)   http://www.jprs.co.jp/
    - WIDE Project   http://www.wide.ad.jp/

- Government
    - Ministry of Internal Affairs and Communications(MIC)
      http://www.soumu.go.jp/

Members – the taskforce (2/2)

- Telecommunications Associations
  - Telecom Services Association   http://www.telesa.or.jp/
  - Telecommunications Carriers Association http://www.tca.or.jp/
  - Japan Cable and Telecommunications Association
    http://www.catv-jcta.jp/
  - Japan Data Communications Association (JADAC)
    http://www.dekyo.or.jp/
  - Japan Approval Institute for Telecommunications Equipment
    (JATE)   http://www.jate.or.jp/
- Vendors Associations
  - Communications and Information network Association of Japan
    (CIAJ)   http://www.ciaj.or.jp/

Action Items for the TF

1. List up the issues to solve by each player
2. Information sharing among member organizations
3. Establish the Q&A center
4. Design and Operation of the testbed
5. Issues and its solution of security during the transition process
6. Outreach to new stakeholders suffering from IPv4 address exhaustion

Working Groups within the TF

WG	In charge of	lead	members
Publicity	Assistance for events/conferences of member associations, Regular press conferences Planning of outreach	JPNIC	IAJapan Telesa, JAIPA 6PC
Education and Testbed	Education programs, negotiation with certification providers, planning the testbed	v6PC	JPNIC JATE JAIPA JCTA/JCL JANOG jus WIDE DISTIX
Action planning support	Supporting the action planning by every stakeholder	v6PC	IAJapan, Telesa, JAIPA JPNIC
Applications	Enlightening the SIers,	v6PC	JUS JISA
Access Network	Negotiation with Access Network providers	JAIPA	TBD
Ready Logo	Planning IPv6 Ready Logo for ISPs and Web sites	JATE	v6PC
Secretariat		v6PC	JPNIC

Activities of Publicity WG

- Web Page has been set up
  - http://kokatsu.jp/ (kokatsu is for /exhaustion)
  - http://4xtf.jp/ (IPv4 eXhaustion TF)
- Stakeholder Survey : 1st survey done
  - To question the awareness and progress on the IPv4 exhaustion and its countermeasure
  - Semi-annual surveys planned
- Streamlining all the events by members
  - Assistance to provide the contents of IPv4 exhaustion, organizing the events as a series

Activities of Action Planning WG

- Recommended timeframe version 1 published in Feb. 2009, and available also in English!

  http://kokatsu.jp/blog/ipv4/en/data/090217_v4exh_actionplan_en.pdf
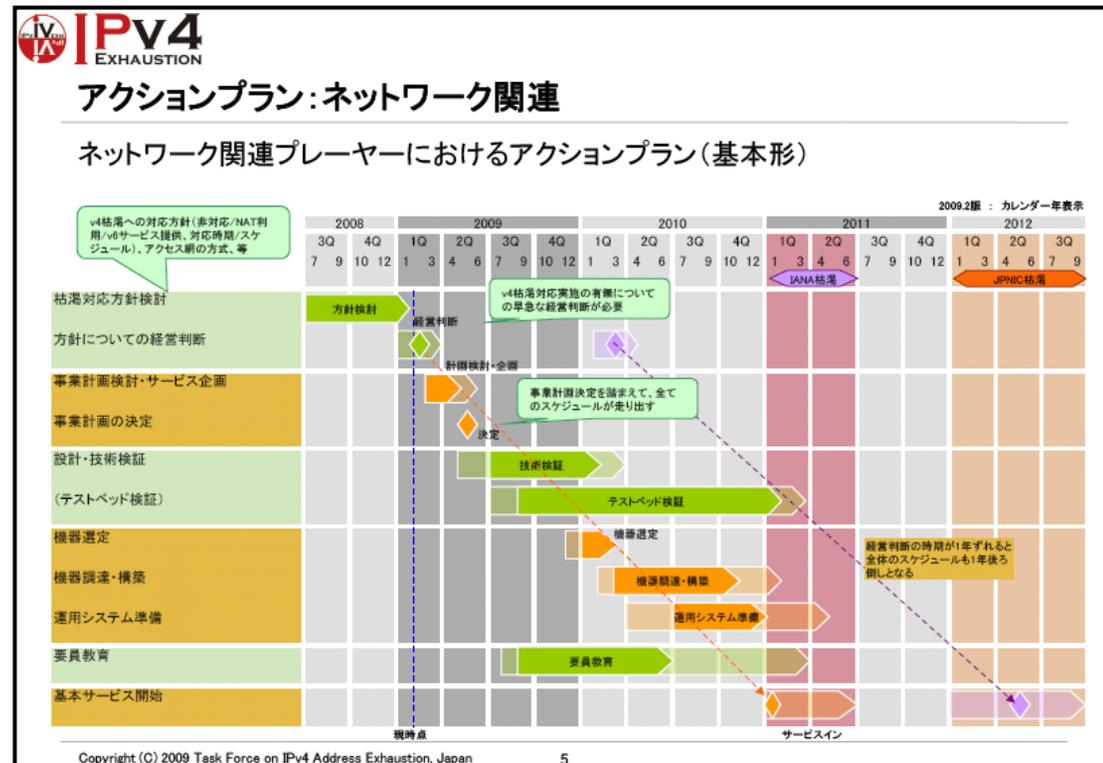
Activities of Education and Testbed WG

- Education
  - Prototype the education program on IPv6 tech and ops at members' events
    - Allow commercial training providers to deploy it
  - Request the technical certificate programs to include IPv6 contents

- Testbed
  - MIC's FY2009 budget for constructing a testbed
    - Nation-wide network + testbed center for any stakeholders to try on IPv6
  - Testbed Center has just launched in Keio's K2 Campus
  - 1st Hands-on training in September – Sold out in a single day

Activities of Application WG

- Approaching to consortiums/associations /communities of application/light-language developers and System Integration firms
  - For enlightening, awareness increase and learning the situation

- Only small problems found in terms of IPv6 readiness
- Still suffering from lack of awareness

Activities of
Access Network WG

- NTT has been considering the provision of IPv6 access between residential users and ISPs over its NGN

  - Most ISPs now rely on NTT's "Flets" to gain the access to the residential users on IPv4, then that for IPv6 has been sought among JAIPA, NTT and MIC

- Reporting Session by TF was held gathering a lot of interested people, as consideration has come to last call phase

Activities of
Ready Logo WG

- Allow IPv6-ready ISPs and Web sites to *"differentiate from others"*

  - Apply and extend the strategy of "IPv6 Ready Logo" for equipments to services like ISPs and Web sites

- Had domestic and Intra-TF discussion, then synchronize it to *"IPv6 Embedded Program"* of *IPv6 Forum* – launched in June 2009

  - Why don't you get the logo at:

    - http://www.ipv6forum.com/ipv6_enabled/ipv6_enable.php !!

Kokatsu.jp has already put on the logo, of course!

Some other activities harmonized with TF

- v6PC: Home Gateway WG
  - Operators and Vendors to compile recommended specification for home gateway device
  - The recommended specification has just been publishe
- IPv6 Operations Forum
  - Voluntary conference on the operators dealing with IPv6 to share the practice

To conclude…

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excerpt from Survey Result,

Timeline for our activities,

and the summary

Awareness?
Excerpt from Survey Result (2/2)

- *Do you know that IPv4 address is running out in near future and not available for the new distribution?*

	Overall	telecom	ISP	ASP CSP	iDC	CATV	Soft-ware vendor	Telecom equipe-ment vendor	Vendor others	Sler	others
Don't know	1.3%	2.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	5.3%	4.8%
Yes, but not when it runs out	17.2%	8.2%	19.7%	0.0%	26.1%	7.4%	14.3%	43.3%	60.0%	0.0%	19.0%
Yes, including when it runs out	80.7%	89.8%	80.3%	100.0%	73.9%	92.6%	71.4%	56.7%	40.0%	94.7%	76.2%

Progress? Or Problem?
Excerpt from Survey Result(1/2)

consideration for countermeasure

Done | under consideration | consideration planned | no plan

| 16.0% | 36.5% | 42.1% | 5.3% |
| Done | Under Consideration | Consideration Planned | No Plan |

0%   20%   40%   60%   80%   100%
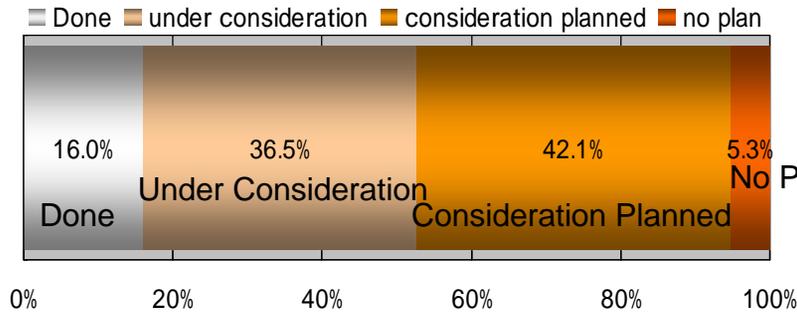
What is the problem for deploying the countermeasure

- Understanding of the Management — 28.8%
- Cost — 66.4%
- Technical Knowledge — 59.0%
- Human Resource — 41.3%
- Lack of Solution — 35.4%
- Understanding by surroundings — 28.0%
- Others — 12.7%
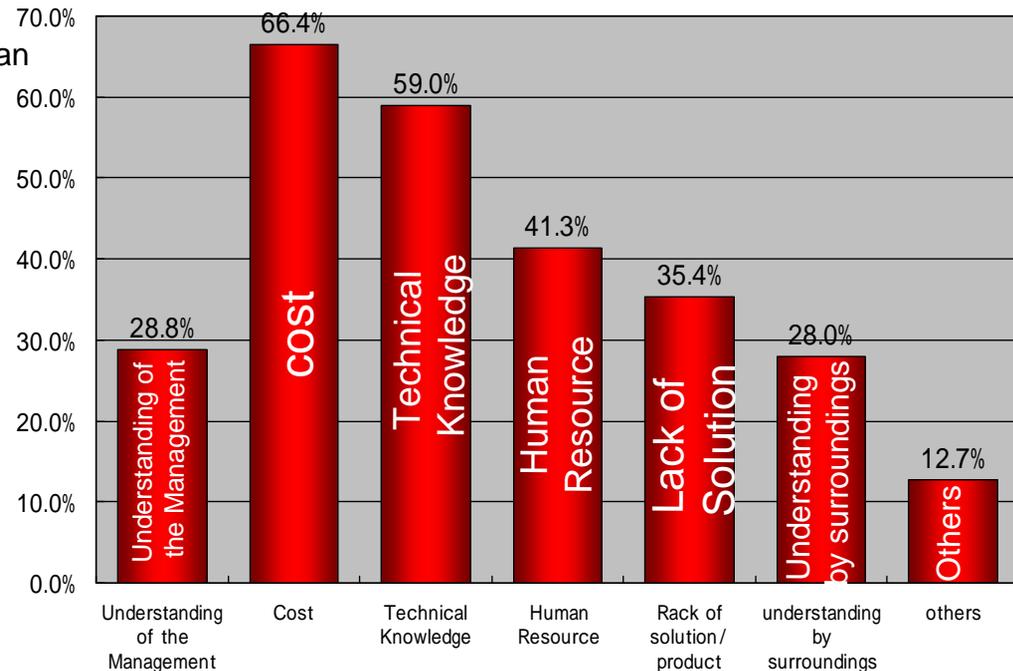
IPv6 service deployment

In service | Experimental | under preparation | to be considered

| 8.70% | 22.30% | 35.00% | 34.00% |
| In Service | Experimental | Under Preparation | To be Considered |

0%   20%   40%   60%   80%   100%

26
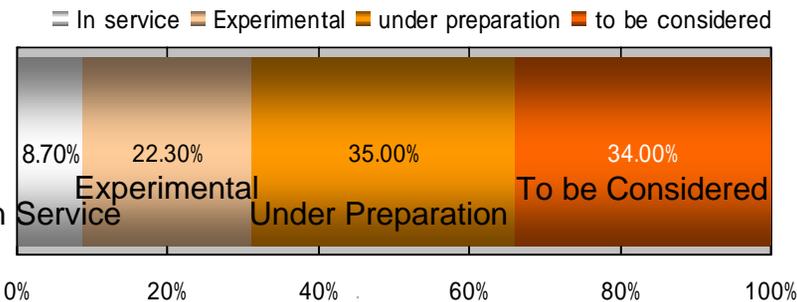
Each player needs to consider and deploy its own countermeasures!

From http://www.kokatsu.jp/blog/ipv4/en/data/090217_v4exh_actionplan_en.pdf

Network Operators timeline

Policy (none?/ NAT?/ IPv6 Service Provision?/ Timing?/ Schedule?), Access network, etc.

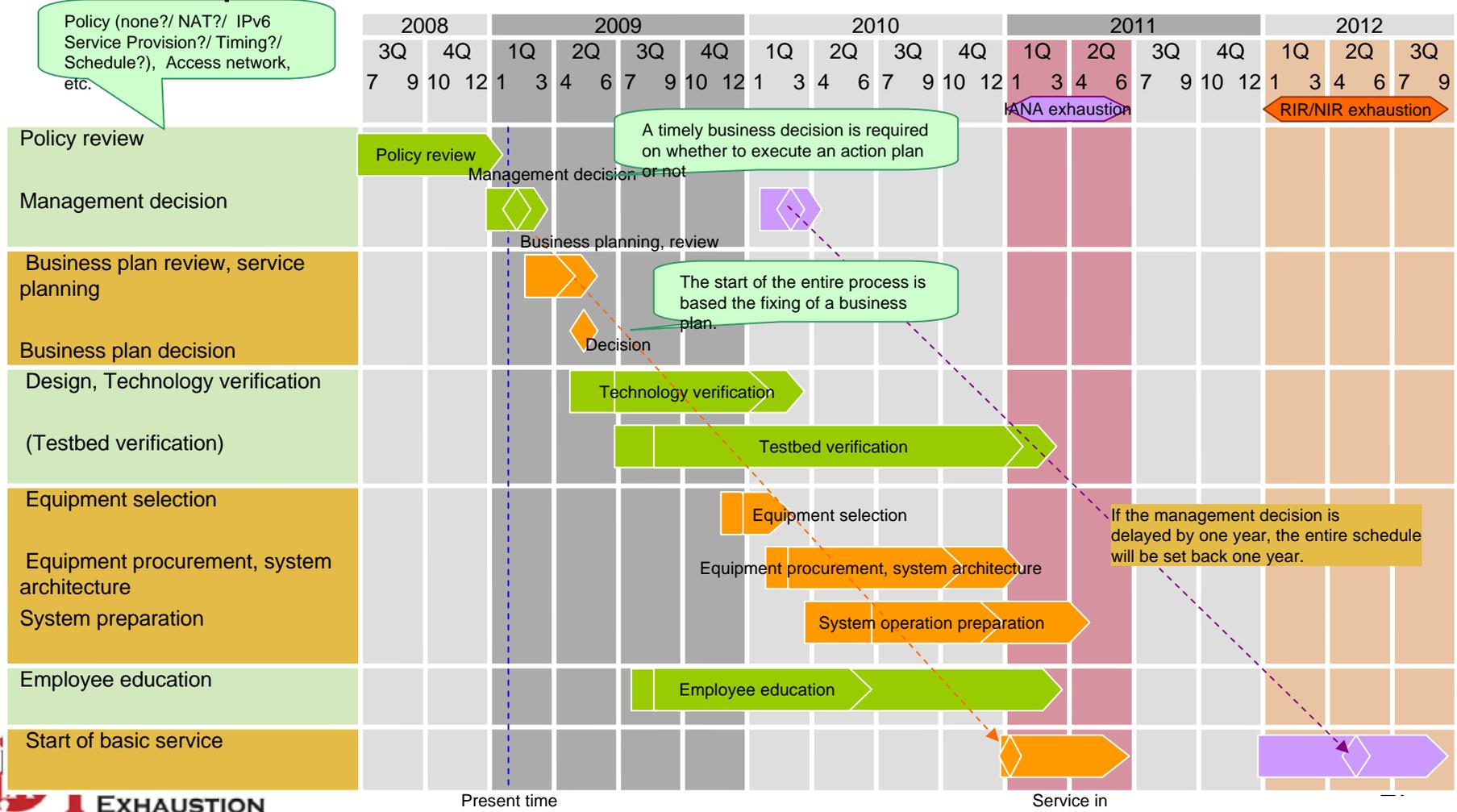|	2008		2009				2010				2011				2012		
	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q

IANA exhaustion

RIR/NIR exhaustion

Policy review — Policy review

Management decision — Management decision

A timely business decision is required on whether to execute an action plan or not

Business plan review, service planning — Business planning, review

Business plan decision — Decision

The start of the entire process is based the fixing of a business plan.

Design, Technology verification — Technology verification

(Testbed verification) — Testbed verification

Equipment selection — Equipment selection

Equipment procurement, system architecture — Equipment procurement, system architecture

System preparation — System operation preparation

If the management decision is delayed by one year, the entire schedule will be set back one year.

Employee education — Employee education

Start of basic service

Present time

Service in

EXHAUSTION

To summarize…

- Obvious need for collaborative endeavor to solve *"watching to see what the others will do"* situation

- Task Force on IPv4 address exhaustion, Japan for such a solution

- Information, Information, Information !! – not only IPv6 technologies, but the potential risk and *"what the others do"*

- Exhaustive and substantial endeavors are already on-going

Thank you very much

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- E-mail us to
  - Info@kokatsu.jp for any inquiries on any of your interests