

Before and After IPv4 Address Exhaustion

ISP

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IIJ's IPv6 services

- 1st stage (1999-)
 - connectivity
 - including cache dns
- 2nd stage
 - applications
 - web, mail, dns, ntp
- 3rd stage (now)
 - expanding services

business model for connectivity

- IIJ sells bandwidth
 - Customers can select protocol(s) which should be forwarded on the link
 - IPv4 only
 - IPv4/IPv6 dual stack
 - IPv6 only
 - Or, customer can ask IPv6 over IPv4 tunnel for free.

IPv6 experiences

- can clear away fear for IPv6
 - it works!
- can improve awareness of IPv6
 - production level services
- can convince your customers
 - how we did, problems we met, solutions we did

iiij.ad.jp DNS

```
iiij.ad.jp.      IN      NS      dns0.iiij.ad.jp.  
iiij.ad.jp.      IN      NS      dns1.iiij.ad.jp.  
  
dns0.iiij.ad.jp. IN      A       210.138.174.16  
dns0.iiij.ad.jp. IN      AAAA  
2001:240:bb41:8002::1:16  
dns1.iiij.ad.jp. IN      A       210.138.175.5  
dns1.iiij.ad.jp. IN      AAAA    2001:240:bb4c:8000::1:5
```

ij.ad.jp SMTP

```
ij.ad.jp.      IN      MX  10  omgi.ij.ad.jp.
```

```
omgi.ij.ad.jp. IN      A      202.232.30.70
```

```
omgi.ij.ad.jp. IN      A      202.232.30.144
```

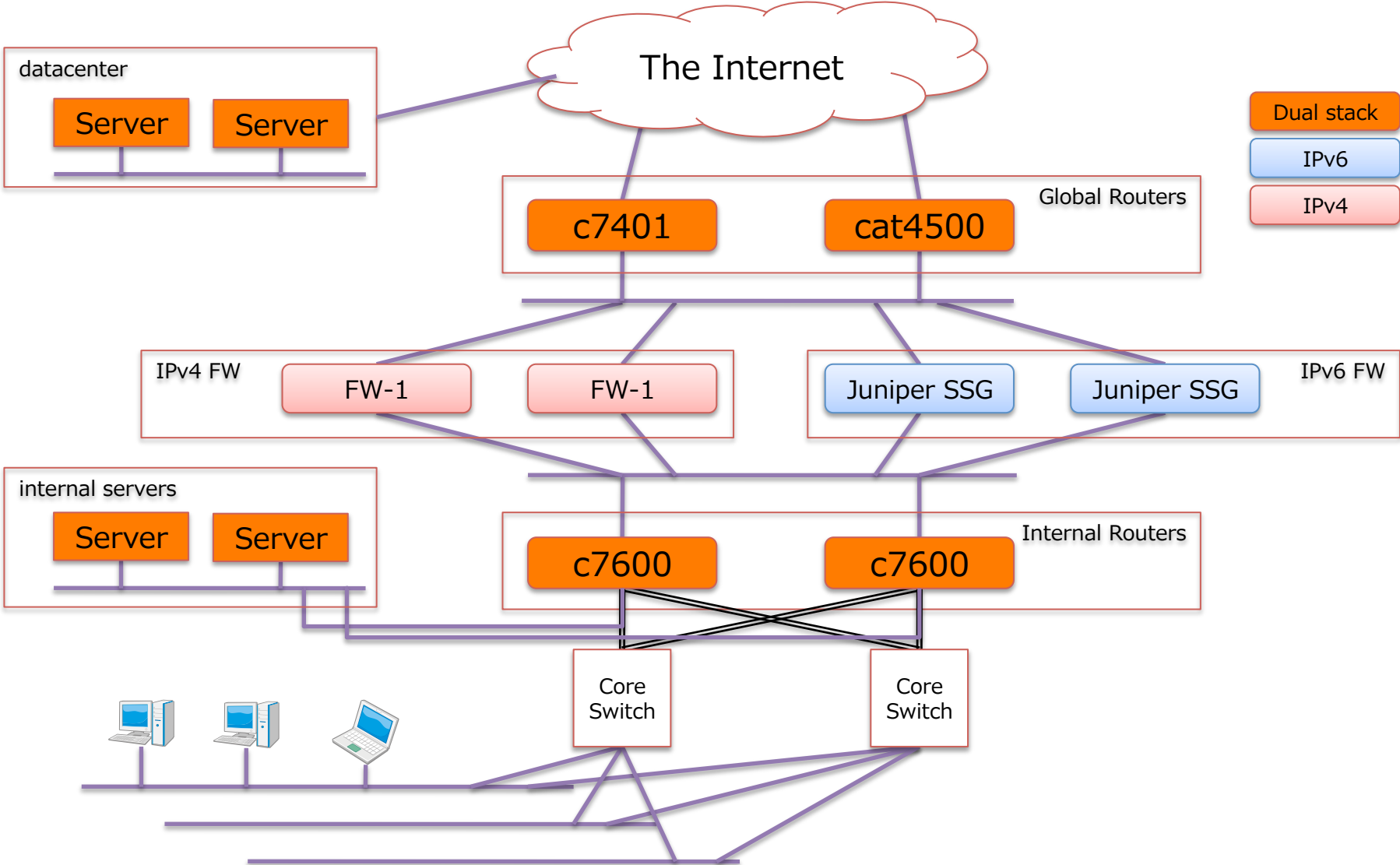
```
omgi.ij.ad.jp. IN      AAAA   2001:240:11e:6300::1:70
```

```
omgi.ij.ad.jp. IN      AAAA   2001:240:11e:6000::1:144
```

iiij.ad.jp WEB

www.iiij.ad.jp.	IN	A	210.130.137.80
www.iiij.ad.jp.	IN	AAAA	2001:240:bb42:b000::1:80
www-v4.iiij.ad.jp.	IN	A	210.130.137.80
www-v6.iiij.ad.jp.	IN	AAAA	2001:240:bb42:b000::1:80

IIJ office



IPv4 Address Exhaustion

- ISPs don't need to care about this if:
 - you do not get any more customers, and
 - your customers do not expand their network, and
 - no one starts IPv6 only services in the internet
- Otherwise, ISPs need to prepare for it
 - And IJ thought we need to deploy IPv6

2 timings

- When ISPs run out of its public IPv4 space
 - get more IPv4 space somehow, or
 - ask customers to share IPv4 addresses
- When customers need IPv6 services
 - need to deploy IPv6 in your network
- These timings are depends on your situation

demands for IPv6 services

- power users
- huge enterprises
- governments
- ISPs
- contents providers

demands for IPv6 information

- System Integrators
- ISPs
- vendors
 - home gateways
 - network equipments
- academies

publication

- IJ publishes IPv6 deployment status of its services on www site.
 - <http://www.ij.ad.jp/service/IPv6schedule/>
- This helps our customers to plan their IPv6 deployment.

When ISPs Run Out of IPv4 Space

- Still ISPs need to provide IPv4 connectivity services to consumers
- Sharing IPv4 address
 - and there are several ways
 - <http://www.attn.jp/maz/p/c/ipv4sharing2009/>

One Internet

- it's one of the greatest value of the internet
 - people connected
- keep connected
 - even “Before and After IPv4 Address Exhaustion”
- And we believe our customers need IPv6 to connect each other or internet

summary

- 2 timings
 - When ISPs run out of public IPv4 space
 - When customers need IPv6 services
- stakeholders should keep informed
 - drastic change of end-users' network
 - schedule