

Rapid Transition Model for IPv6-accessible Contents

draft-sunq-v6ops-content-transition-02

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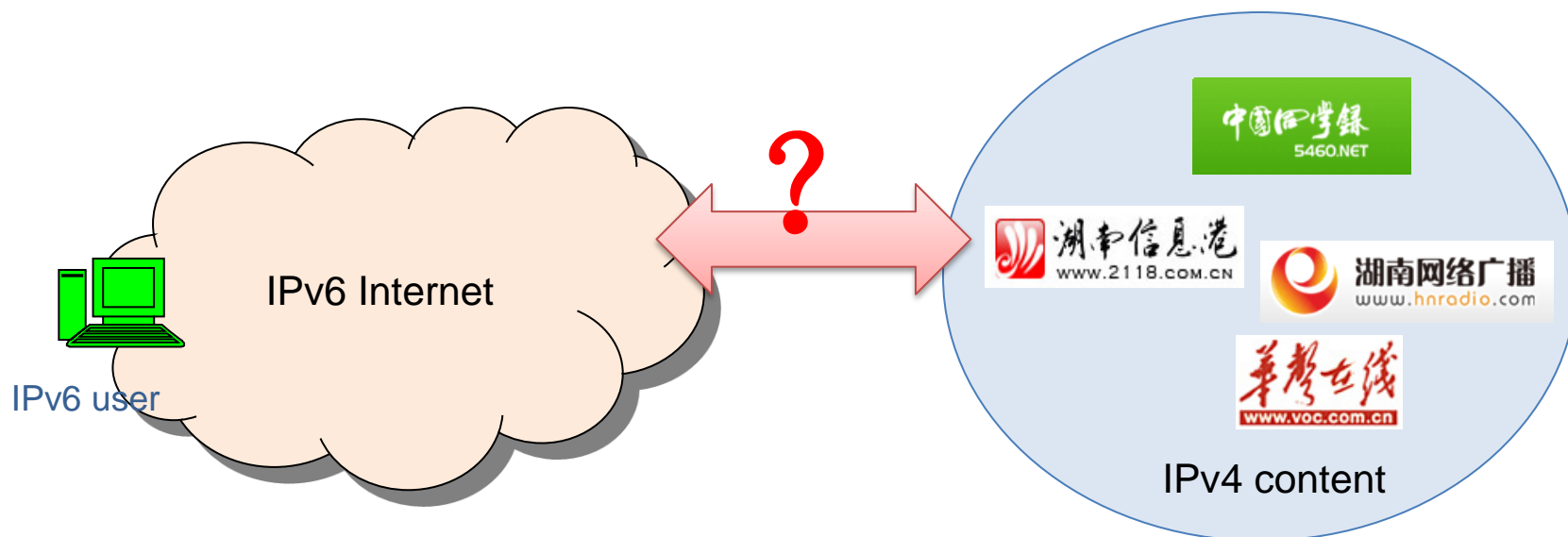
Current Situation for ICP Transition

- The lack of IPv6-reachable contents becomes one of the main obstacles in IPv6 development.
- ICPs are facing great challenges to upgrade to IPv6 natively
 - Numerous application systems have been designed based on IPv4 address inherently.
 - Content providers are lack of implementation/operational experience for IPv6, including IPv6 service provision, user management, security, etc.
 - Most ICPs are reluctant to take action on IPv6 transition without explicit profit , especially for small-to-medium ones.

Our Field Trial Practice on IPv6

- China Telecom has started the field trial in Changsha and Wuxi ever since 2010.
- We have deployed end-to-end dual-stack field trial and have more than 200,000 IPv6 subscribers.
- However, since existing IPv6 accessible contents are still far from enough, the overall IPv6 network is near empty.

Our Purpose is to Fill the Gap

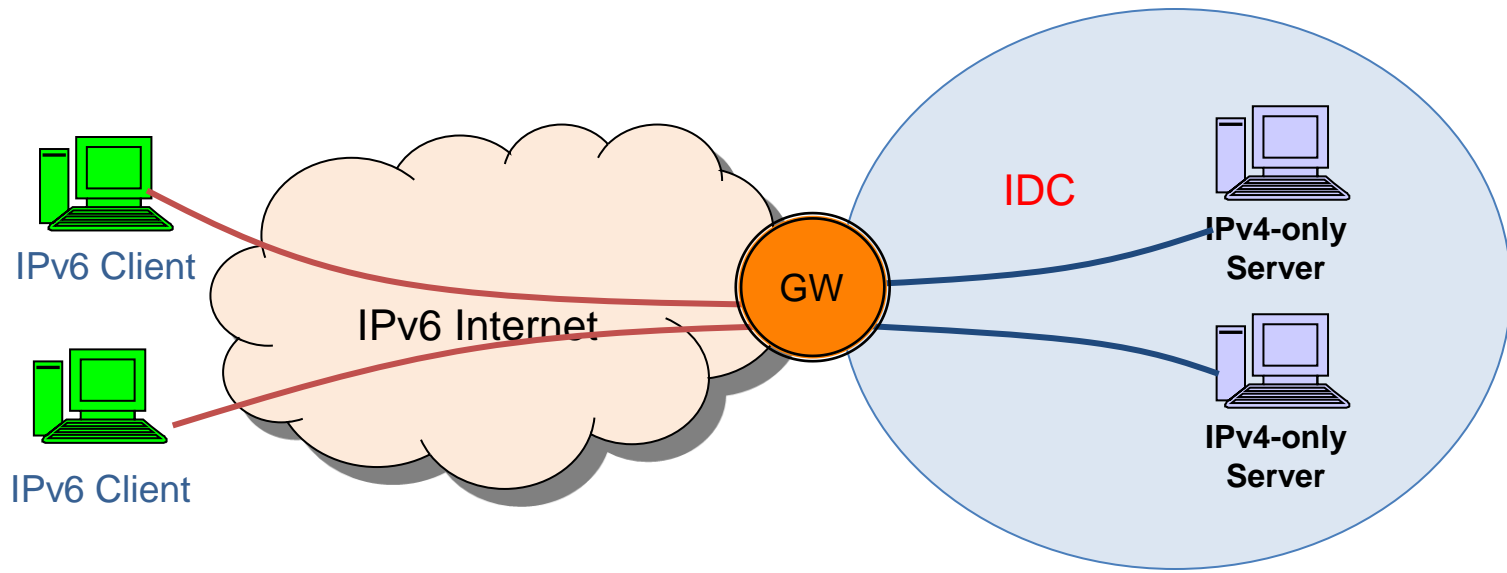


How to break ?

We really need IPv6 traffic and more IPv6 accessible contents to give us confidence again.



Model-1: IPv6 client to IPv4 server scenario



- Provide attractive low-cost method to increase the IPv6-accessible contents rapidly

Deployment considerations (1)

- Address Mapping
 - To save global IPv4 addresses which become scarce resources , private blocks, for instance 10.0.0.0/8 may be used for the Stateful NAT64 in most cases.
 - Two modes:
 - 1:1, one IPv6 address is mapped to one IPv4 address with no port mapping, better scalability
 - N:1, each of the IPv4 addresses will be shared by multiple IPv6 users from Internet with port mapping

Deployment considerations (2)

- DNS implementations
 - Add Static synchronized AAAA records in authoritative DNS servers.
 - Additional tools to automatically synchronize AAAA records are offered to reduce the burden of manual configuration.
- Traffic Logging
 - 1:1 mode:
 - Subscriber-based logging {IPv6 address, IPv4 address, timestamp}
 - 1:N mode:
 - Subscriber-based logging with port set is recommended to greatly reduce the logging burden, especially for large-scale operators

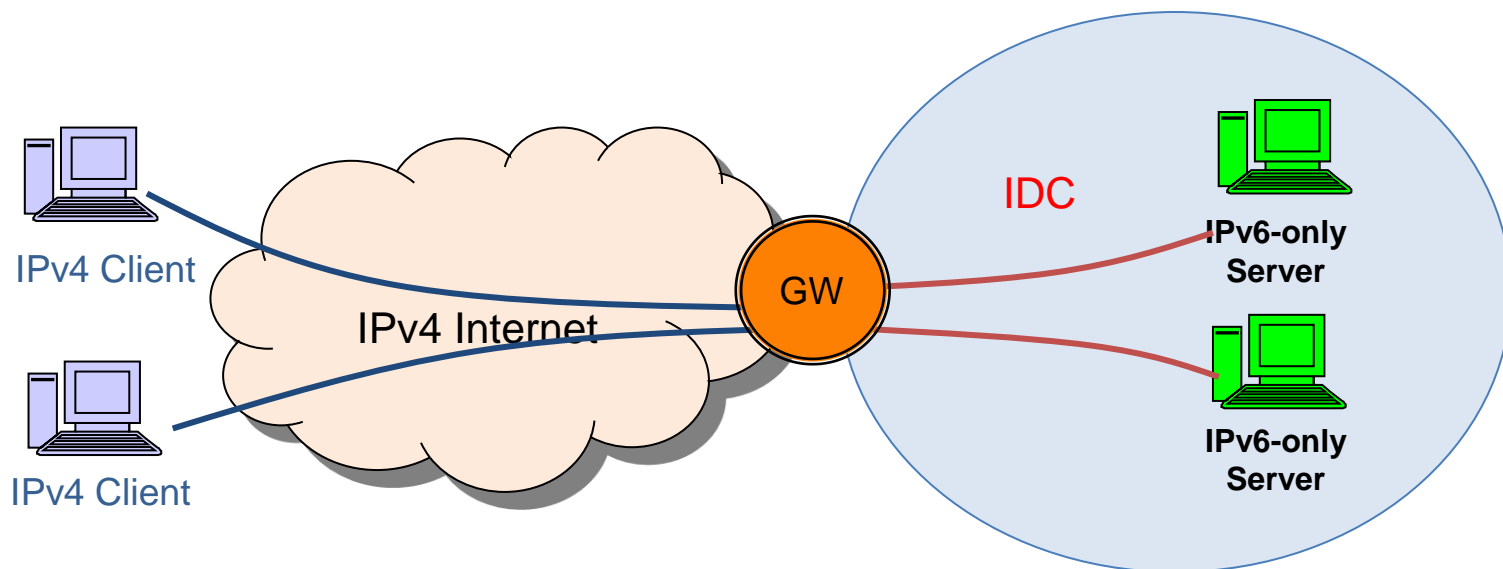
Deployment considerations (3)

- Geographically aware services
 - A separated geo-location server would maintain the same address binding records as logging server.
 - An open web-service API is offered to content providers, which will retrieve the original IPv6 address for a given translated IPv4 packet from geo-location server.
- ALG issues
 - Since the application types in a certain IDC can be known in advance, limited ALGs will be needed in this case.

Deployment considerations (4)

- Security
 - When deploying stateful NAT64 in server-side, it is hard to apply source-based filtering policy.
 - It is necessary to detect the status of NAT64 states, including consuming speed, occupied proportion, etc.

Model-2: IPv4 client to IPv6 server scenario



- Encourage native IPv6 deployments in a well-controlled manner

Deployment Considerations(1)

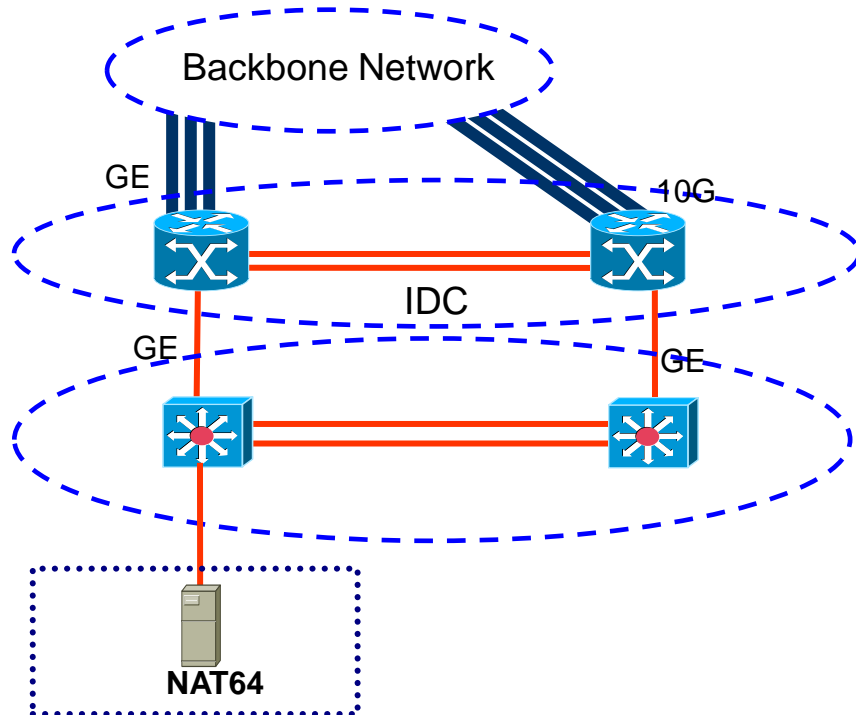
- Mapping and Addressing
 - IPv6-only server should be configured with an IPv4-translatable address.
 - A specific prefix to synchronize the IPv6 address should be announced in IDC.
- DNS
 - A records which are extracted from IPv4-translated addresses should be added directly on authoritative server.
 - Other considerations are similar with Model-1.

Deployment Considerations(2)

- Logging
 - No logging issue
- Geographically aware services
 - Content providers should be firstly configured with a pre-defined prefix for stateless translation
 - Identify IPv4-converted IPv6 address among IPv6 packets
 - Extract the embedded IPv4 address which would reflect its original IPv4 geographical information.
- ALG issues
 - It is the same with Model-1.

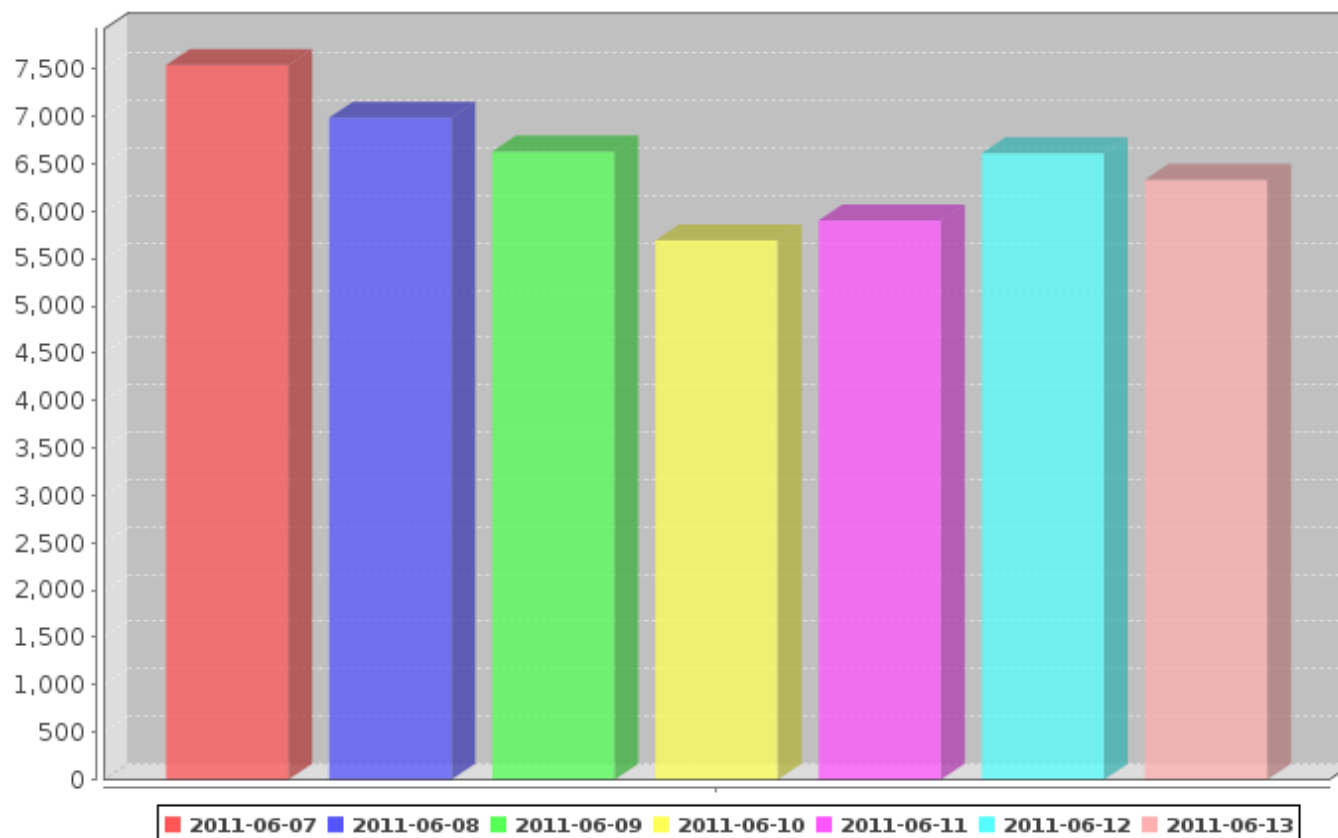
Our Deployment Experience

- We have deployed carrier-grade ICP-transition platform, located in the exit of IDC.



User Statistics

- More than 15 thousands different IPv6 users ever accessing the above six Content Providers.



Deployment and Experiment

- We have tested TOP100 websites for IPv6-only users.
 - Over 90% of video websites (like youku, tudou, etc) have ALG problem which embedding IPv4 address directly.
- Possible Solutions:
 - Apply HTTP-ALG in NAT64 gateway
 - Upgrade CDN to support IPv6

Next step...

- We would like to ask for adoption of WG item.
- Comments and contributions are welcome
 - <http://tools.ietf.org/id/draft-sunq-v6ops-contents-transition-02.txt>

Q&A