

# IPv6 Practices on China Mobile IP Bearer Network

**draft-chen-v6ops-ipv6-bearer-network-trials-00.txt**

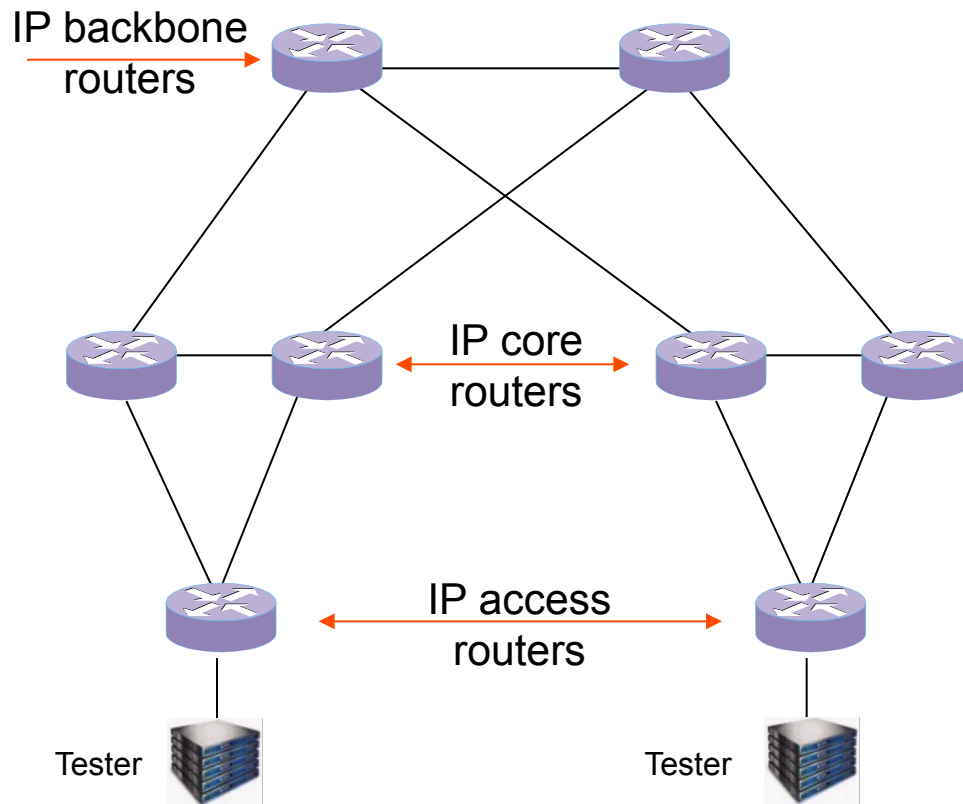
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# Background

- China Mobile IPv6 trial program started over 3 years ago
- This presentation is mainly focusing on IP bearer network infrastructure for incremental IPv6 deployment
  - IPv6 testing on routers was undertaken in our lab before the pre-commercial trials, where there were 7 vendors involved and six months lasted
  - With incremental extension, support for IPv6 access network (both mobile and fixed access network) and IPv6 service could be introduced
- Trials for IP bearer announced in June 2011, and BRAS will be announced later

# Testing Methodology on IP bearer network trials



- The trial was taken place on hierarchical IP bearer network
- Two router testers generate routing information and inject into the under-testing network
- Test cases
  - IPv6 routing protocol : BGP4+, OSPFv3 and ISIS
  - Dual-stack routing protocol
  - Tunnel protocol: 6PE/6vPE and configured 6in4 tunnel
  - IPv6 ACL, policy routing capabilities and IPsec supporting
  - IPv6 routing MIB

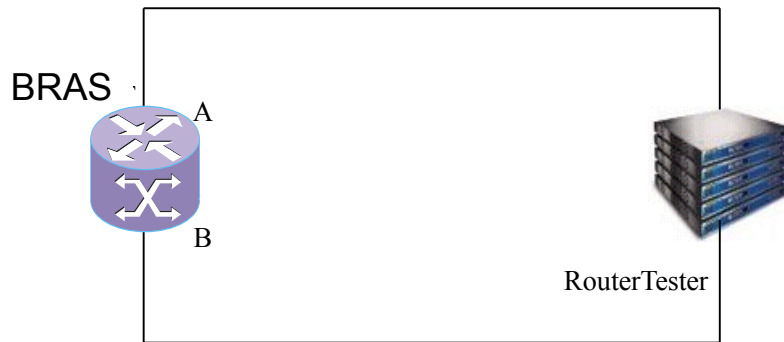
# Testing results and observations

Items		Results	Observations
IPv6 routing protocol testing	OSPFv3	OSPFv3 can't establish adjacencies due to inconsistent IPv6 MTU between neighboring routers	The unified MTU configuration is recommended
	ISIS	OK	MT Routing in IS-IS is recommended to be enable or disable simultaneously
	BGP4+	OK	BGP4+ can't support AS routing loop error processes due to private implementations
Dual-stack routing protocol		OK	Routing paths have been computed by IPv4 and IPv6 routing algorithm independently

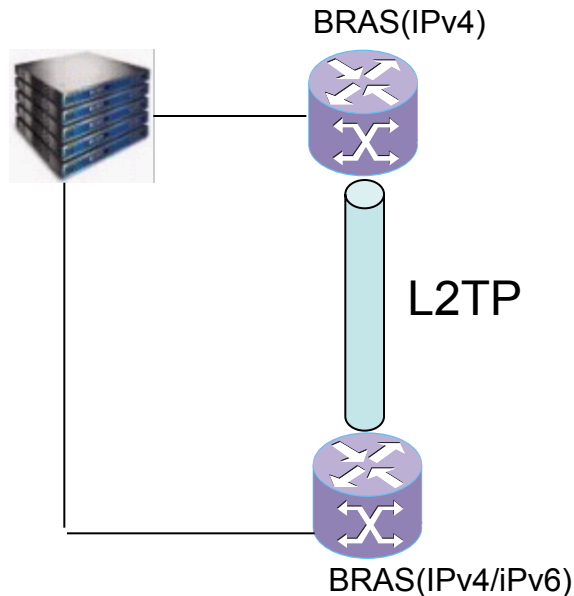
# Testing results and observations (Cont.)

Items		Results	Observations
Tunneling protocol	6PE/6vPE	OK	The caution has been raised by MTU configuration since intermediate routers would drop big package surpassing network MTU
	Configured 6in4 tunnel	Routers are failed to support encapsulation package going through MPLS network	6PE/6vPE are recommended when MPLS is widely enable.
IPsec supporting		IPsec capabilities is missing in most routers	It 's expected to be supported along with IPv6 deployment
Routing MIB supporting		IPv6 MIBs supporting varied significantly from vendor to vendor	Private MIB have appeared to be difficult to build an integrated OAM platform

# Testing Methodology on BRAS



- Case1: BRAS standalone testing
- Basic IPv6 protocols supporting
  - Performance testing



- Case2: BRAS networking testing
- L2TP tunnel
  - Subscriber profile management

# Testing results and observations

Items		Results	Observations
Standalone testing	IPv6 protocol	1) Can't integrate DHCPv6 functionalities; 2) Can't support MLD and PIM/SM	1) Operator has to build separate DHCPv6 server; 2) multicast-based services are hardly developed
	Performance testing	1) IPv6 FIB capacity is only 10% of its IPv4 FIB capacity; 2) Line card throughput is much less than the nominal values when data packages length shorter than 128B	With IPv6 data packages are increasing, it is expected that performance should be upgraded
L2TP networking testing		1) BRAS can't support IPv6 address delivery through L2TP tunnel; 2) BRAS can't distinguish IP flow in term of IPv4/IPv6 traffic	1) IPv6CP signaling is not supported in the case of L2TP tunnel deployed; 2) operator can't carry out custom charging policy based on different IP families characters

# Summary

- In general, the tests on several aspects indicate that the network has basically qualified for IPv6 operations
- The community should pay more attentions to increase IPv6 supporting maturity. IPv6 normative features becoming stable & scalable will take more time than you expected
- Operators still need to accumulate experiences on IPv6 network configuration and provisioning during the transition period

**Comments are welcomed!**