

# **The Survey and Deployment of The IPv6 Transition**

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# Outline

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1

IPv6 & IPv4 Current Situation

2

IPv6 Transition Scenarios for ISP

3

IPv6 Transition Mechanisms for ISP

4

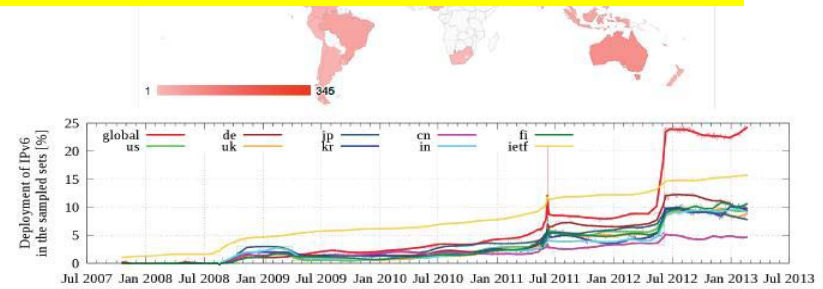
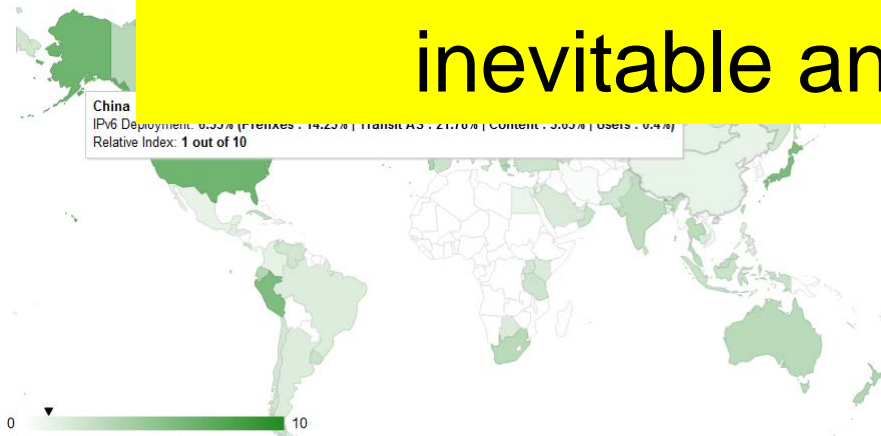
The Deployment Considerations

# IPv4 & IPv6 Current Situation

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- ❑ The commercialization of IPv6 has begun.
  - ❑ IPv6 addresses allocation: 200 countries; DNS: 13 DNS, 10 with IPv6.
  - ❑ Websites: 160 million websites tested, 2.7% with IPv6.
  - ❑ ICPs: Top10 ICPs, 5 with IPv6: Google, Facebook, YouTube, Yahoo, Wikipedia.

❑ The IPv6 transition and the long-term coexistence of IPv4 and IPv6 are inevitable and fairly urgent.



Source: Lars Eggert, <http://eggert.org/meter/ipv6>

# What should we do for IPv6 transition?

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Network characteristics      Transition requirements

Transition scenarios

Deployment

Transition mechanisms

Feasible and appropriate plan

IPv6 transition scenarios

ISP  
networks

IPv6 transition mechanisms

Evaluation

Deployment considerations

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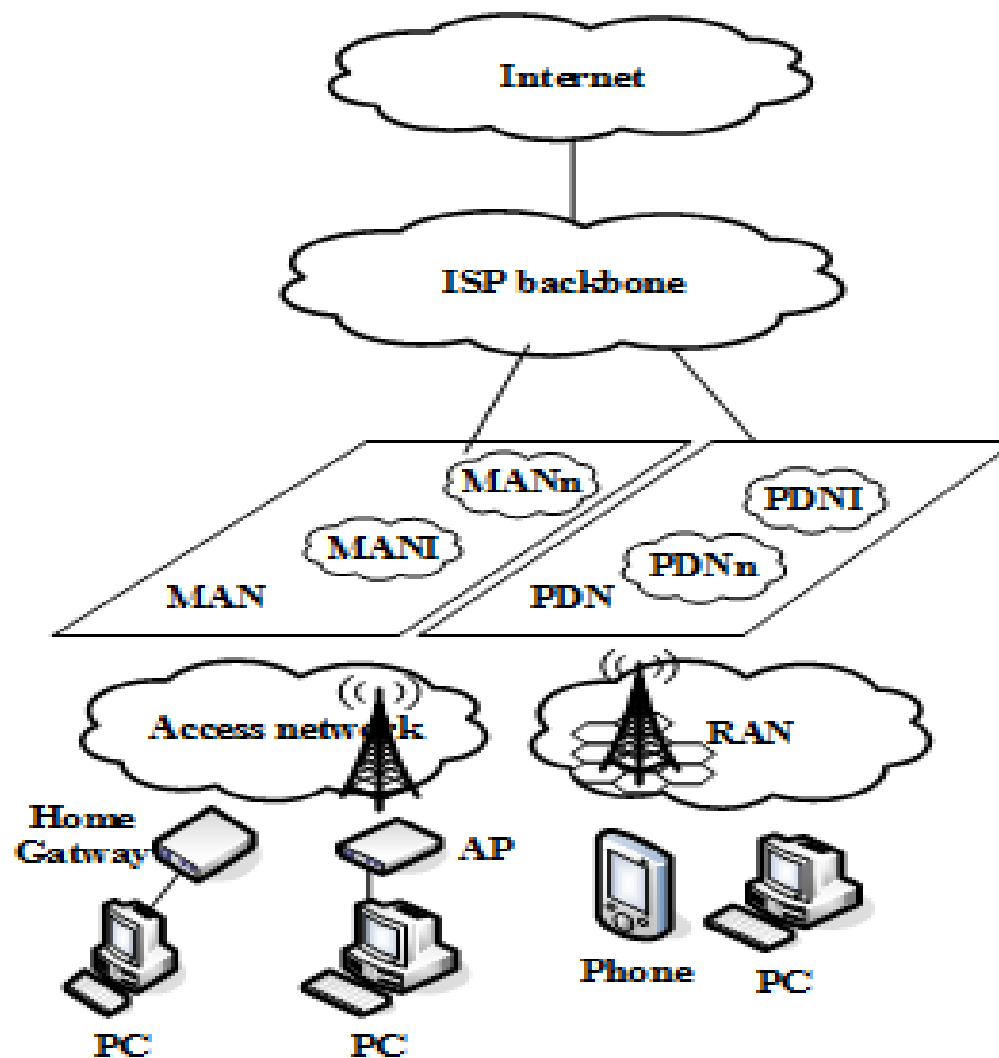
3

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# ISP network architecture



# The time-varying transition phases

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- Phase 0: IPv4-only
- Phase 1: IPv4-dominated, a few IPv6
- Phase 2: IPv6-dominated, a few IPv4
- Phase 3: IPv6-only

# Transition Scenarios of Core Network

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- ❑ IPv4-only Core network
- ❑ IPv6-only Core network
- ❑ IPv4/IPv6 Core network



# Transition Scenarios of Access Network

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- ❑ IPv4-only Access network
- ❑ IPv6-only Access network
- ❑ IPv4/IPv6 Access network

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# Category

- IPv4-IPv6 transition mechanisms
- IPv6-over-IPv4 transition mechanisms
- IPv4-over-IPv6 transition mechanisms

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# Deployment considerations in ISP core networks

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- ❑ MPLS Core network
- ❑ IP Core network
- ❑ New IPv6 Core network

# Deployment considerations in ISP access networks

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## The comparison of transition strategies

- IPv4-IPv6: Public/Private dual stack
- IPv4-IPv6: Stateless translation(IVI), Stateful translation(NAT64)
- IPv6 single-stack: IPv6-over-IPv4 tunneling(6RD)
- IPv4 single-stack: IPv4-over-IPv6 tunneling(DS-Lite), double translation(MAP-T)

# IPv6 Transition Deployment in CSTNet

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- ❑ IPv6 network covers 100 research institutions
- ❑ The core network, MAN, user network and desktop application support IPv4/IPv6
- ❑ Network management system supports IPv4/IPv6
- ❑ Secure network environments supports IPv6



# THE WORLD IS DIFFERENT NOW!

