SCTE CABLE-TEC EXPO '13
OCTOBER 21-24 / ATLANTA, GA

MASTERING THE IPV6 TRANSITION

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Introduction

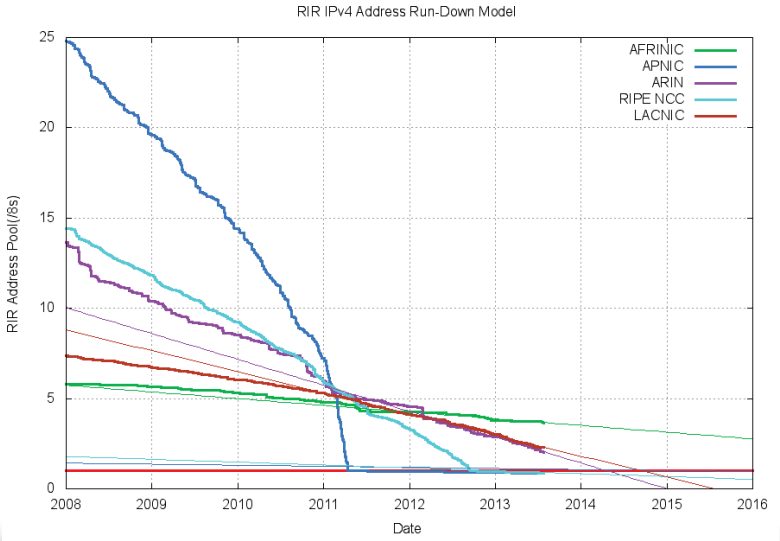
Placeholder for Introduction Video

- Video will be embedded in presentation. For reference, video can be viewed online - http://www.youtube.com/watch?v=HEKZpV125SM

IPv4 Exhaustion Is Real

IPv4 is in its last days

- IANA officially out as of February 3, 2011
- ARIN has just over 2 /8's available
- ETA to doomsday: January 1, 2015



Service Provider Challenges

The complexity of IPv4 exhaustion

- Content/demand concerns
- Compliance concerns
- Upstream carrier concerns
- Knowledge gap
- Budget

IPv4 vs. IPv6

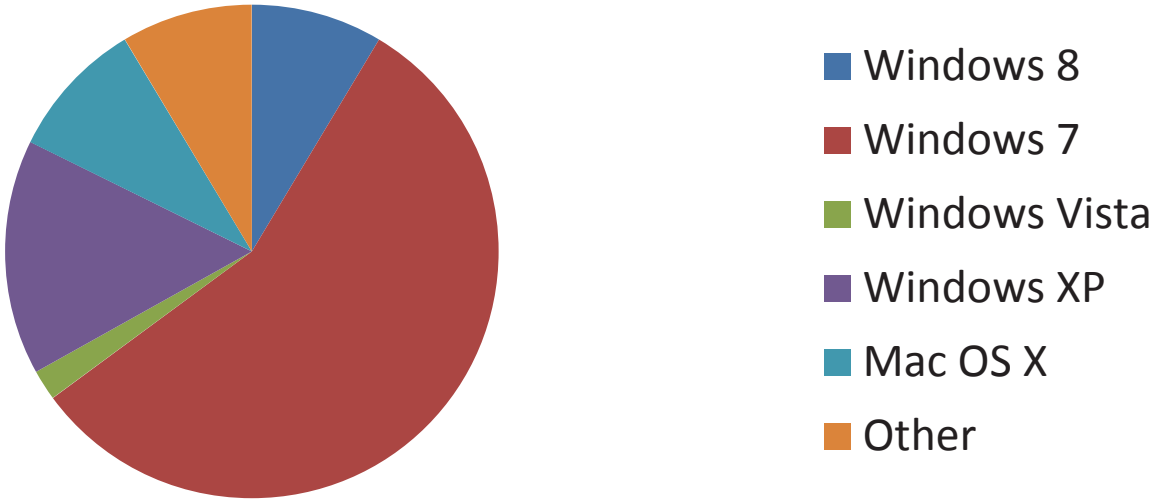
Address Comparison

- Difference at the bit level
  - IPv4
    - 192.168.1.1
  - IPv6
    - 2001:0050:0000:0000:0000:0AB4:1E2B:98AA
  - Number of IPv4 Addresses:
    - 4,294,967,296
  - Number of IPv6 Addresses:
    - 340,282,366,920,938,463,463,374,607,431,770,000,000

IPv6 Transition Issues

Consumer devices primary hurdle

Estimated OS Distribution as of July 2013



**Other OS: All Windows Server OS, Linux, and Mobile Devices*

Other issues –
Consumer routers
Outdated firmware
Businesses needs
Lack of content

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Brokering

- IPv4 Brokering
  - ARIN STLS
    - Listers
    - Seekers
    - Facilitators
  - Legacy IPv4 Resources
- Pros/Cons
  - Simple IPv4 solution
  - No direct path to IPv6

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Reclamation

- Not all devices require public IPs
  - MTAs/Cable Modems
- Public IPv4 space = premium service
  - Customers can pay for a public address
- Pros/Cons
  - Allows redeployment of ineffectively utilized IPv4 resources
  - Process intensive, CALEA/Subpoena issues, no direct path to IPv6

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Software NAT

- Software-based Network Address Translation
  - Network Address Translation performed at CMTS/Edge
  - Hardware dependent
  - Scaling/Application concerns
- Pros/Cons
  - Mitigates IPv4 exhaustion, relatively inexpensive, can be used to provide path to IPv6
  - Hardware/Software intensive, causes issues with ALGs, not scalable, not CALEA/Subpoena compliant

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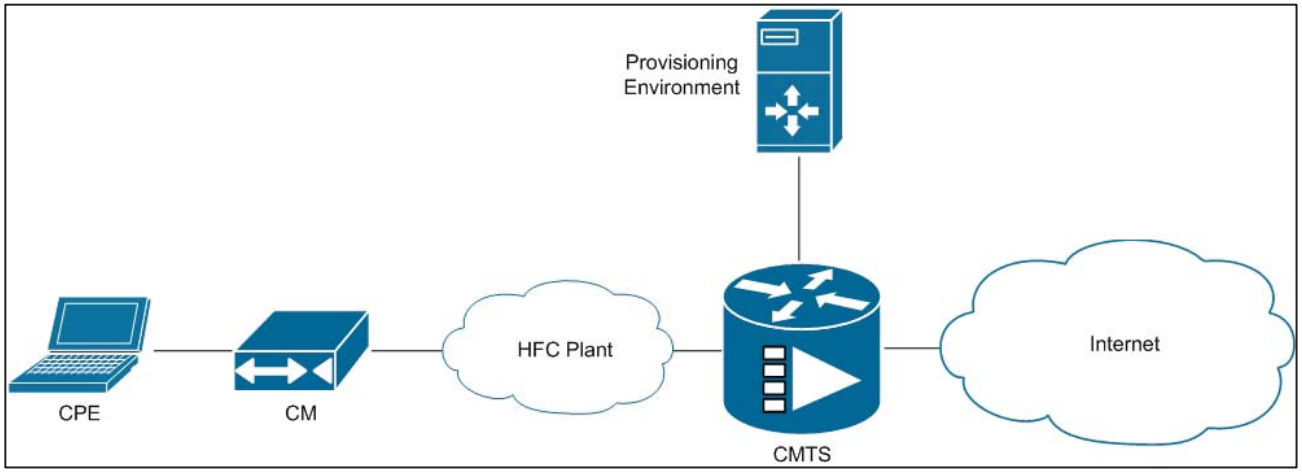

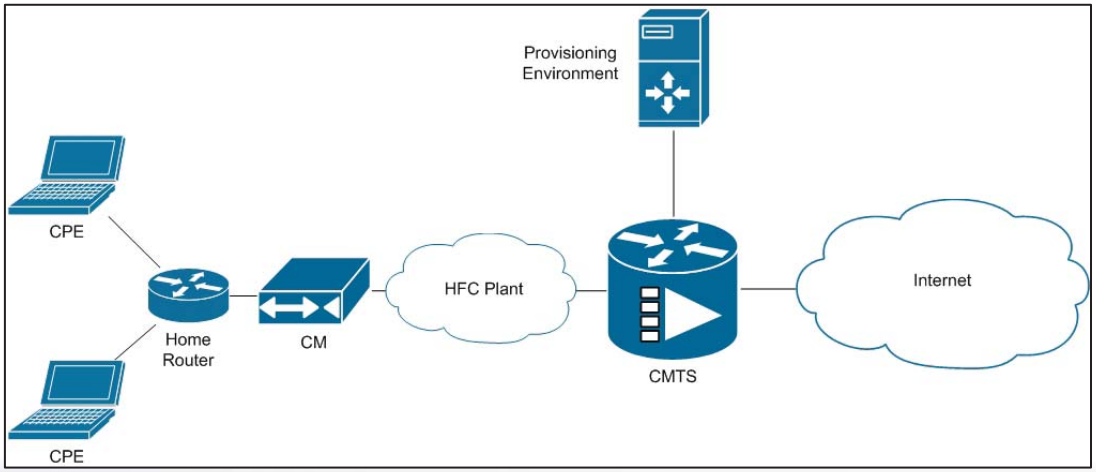

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Hardware NAT

- Hardware-based NAT Implementation
  - Carrier Grade or Large Scale NAT (CGN/LSN)
  - Separate physical box processing NAT requests
  - Various implementations
- Pros/Cons
  - Mitigates IPv4 exhaustion, scalable, compliance with CALEA/Subpeona, can be used to provide path to IPv6
  - Expensive, additional point of failure, introduces additional configuration complexities, storage concerns

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Implementing IPv6

- Protocol differences
  - Header changes
  - Removal of Broadcast/ARP
- Differences in implementation
  - SLAAC vs. DHCPv6
  - Prefix Delegation

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Implementing IPv6

- Important steps to take
  - Allocation from RIR
  - Bandwidth provider IPv6 capable?
  - Internal network deployment
  - Cable bundle deployment
    - 2 Prefixes
    - Prefix size
  - Test functionality

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Summary

- IPv6 deployment does not fix IPv4 exhaustion
- IPv6 small percentage of total internet traffic
- IPv4 will be here for awhile
- IPv6 is the future
- Assimilation is inevitable
- Deploy IPv6!

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