IPv6 Broadband and Cable

NANOG46
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Overview

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Terminology

- CM – Cable Modem
- MTA – Media Terminal Adapter (VoIP device)
- STB – Set top Box
- eMTA – Embedded MTA (CM-MTA in one device)
- eSTB – Embedded STB (CM-STB in one device)
- CPE – Customer Premises Equipment
- IGD – Internet Gateway Device
- DOCSIS – Data over cable standard Interface specification
- PacketCable – Specification to provision and support MTAs behind a CM
- Provisioning – Assigning an IP-address and a service tier to device and subscriber
Core Concepts

• Deploy IPv6 to support management only using IPv6, example devices include:
  • Cable modems
  • Set top boxes
• IPv6 capable components to achieve this minimally include:
  • Core network
  • Access network
  • Device provisioning and management
• Leverage deployment of common infrastructure to enable IPv6 consumers and drive content and service availability using IPv6
Considerations

• Support for IPv6 in many products is still considered new and not nearly mature as their IPv4 counterparts
• Testing and interoperability are critical for a successful deployment
• Bugs and issues will arise in known entities
• Scale makes a difference
• Deploying IPv6 must not impact existing services
Background

• Availability of content and services over IPv6 to date appears to be lacking

• Simply having IPv6 connectivity available is not sufficient

• Availability of content and services over IPv6 must align with availability of the consumers to encourage adoption
Goals and Objectives

• Ensure that underlying infrastructure can support content and service parity over IPv4 and IPv6
  • Native IPv6 is preferred versus the use of tunnels and other techniques
• Understand and identify issues, challenges, and gaps associated with offering content and services over IPv6
• To broaden the adoption of IPv6 among consumers and those who provide content and services.
  • Availability of IPv6 should be transparent to subscribers
Approach

- Two approaches to consider
  - Subscriber CPE that supports IPv6 (computer in this case) connected directly to a cable modem
  - Subscriber IGD that supports IPv6 connected to a cable modem

- In both cases there are pre-requisites that must be met to support IPv6 in a deployable manner
Subscriber IPv6 CPE

Internet (IPv4 & IPv6)
Subscriber IPv6 IGD

Internet (IPv4 & IPv6)
Pre-requisite Highlights for CPE

• For subscriber CPE directly connected to cable modem
  • Support for dual stack CPE by underlying network which includes provisioning
  • IPv6 stack and stateful DHCPv6
  • Applications that support the use of IPv6 transport
Pre-requisite Highlights for IGD

• For subscriber IGD connected to cable modem
  • Support for dual stack CPE by underlying network which includes provisioning
  • IPv6 stack and stateful DHCPv6 (WAN) including prefix delegation
  • Configuration and addressing on subscriber LAN
  • IPv6 routing (and firewall)
  • Subscriber CPE must also support IPv6 including applications
Challenges

• Not all subscriber CPEs support the necessary IPv6 pre-requisites for use in some broadband deployments

• Availability and widespread deployment of IPv6 capable IGDs are lacking

• Challenges associated with routing for delegated IPv6 prefixes should be uniformly addressed
Content and Services

- Availability of content and services over IPv6 must also grow
  - If not, lack of consumption may cause delayed maturation of underlying infrastructure
- Start with core content and services
  - Portals and e-mail
- Additional enhancements to infrastructure will be required
Next steps

• Encourage third party content

• Interact and collaborate with third parties to exercise IPv6

• Define simple, yet functional IPv6 deployment requirements

• Document and share IPv6 experiences based on trials and deployment activities
Q&A

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