

# IPv6 Emerging Stories of Success

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**NANOG47**

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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

# Scope

- Native, dual stack core and access networks
- Backoffice, where applicable, also dual stack
- Cable modems (DOCSIS) single stack IPv4 or IPv6
  - eMTAs remain IPv4
  - eSTBs targeted to support IPv4 only or IPv6 only
- Native dual-stack subscriber services
- Leverage well-known transition technologies to enable enterprise desktop IPv6 connectivity, as needed

# Core Concepts

- Deploy IPv6 to enable and support device management, example devices include:
  - Cable modems
  - Media terminal adapters
  - 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

# 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

# Lessons Learned

- IPv6 must become business as usual for staff from every area of the business
  - Lack of attention here will continue to be problematic for the deployment of IPv6
  - Deferring or avoiding IPv6 will be problematic and complicate the deployment of IPv6
- Large scale testing and interoperability is critical to success of any IPv6 deployment
- Leverage and coordinate other network upgrades and enhancements

# Challenges

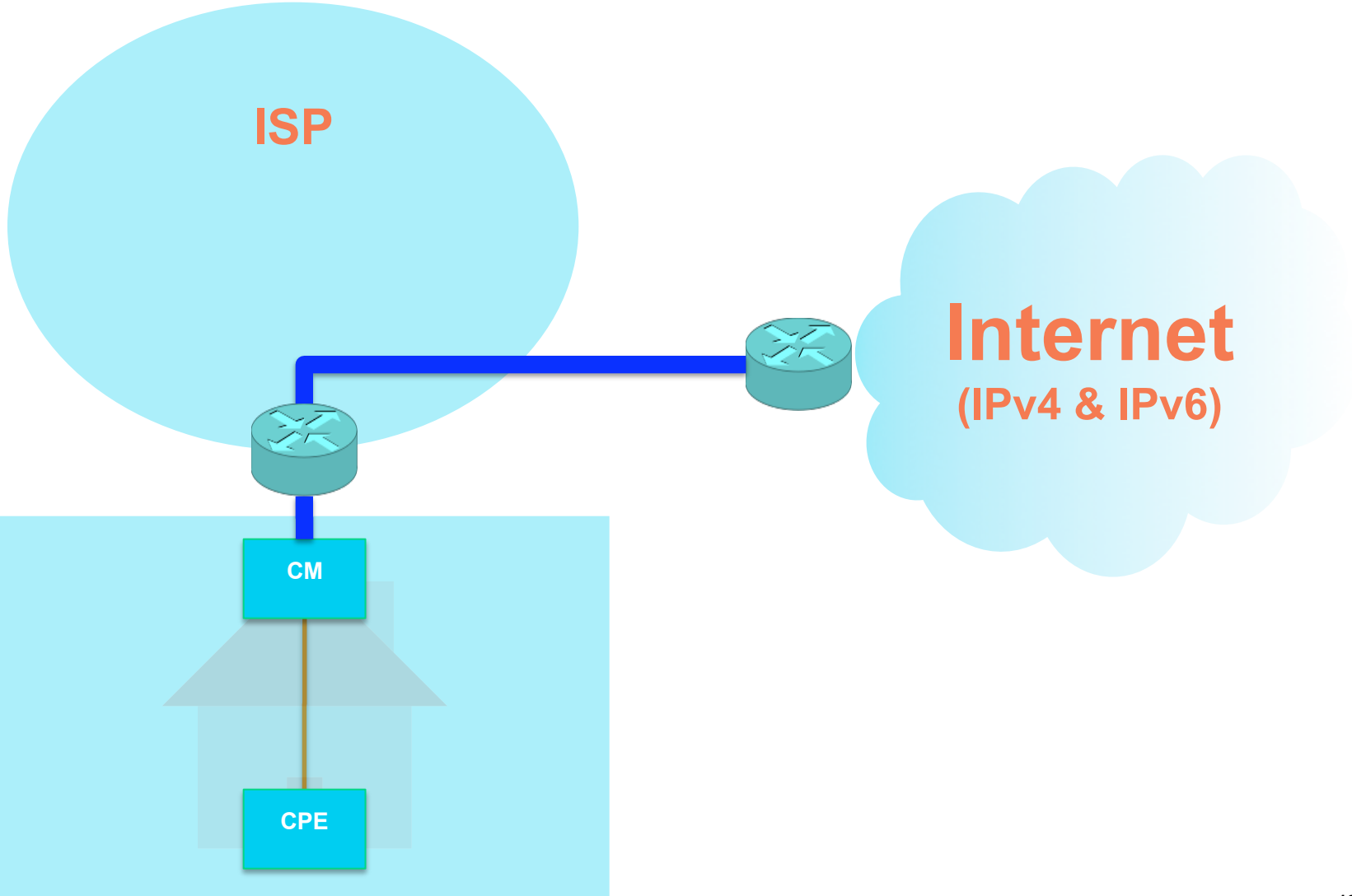
- Manage impact of non-IPv6 features relative to IPv6 program goals and objectives
- Support for IPv6 remains a gap for various security components
  - These need to be addressed to ensure IPv6 can be extended and offered to subscribers
- Back office and tool upgrades to support IPv6 are non-trivial
  - Ideal to divide these efforts into smaller activities



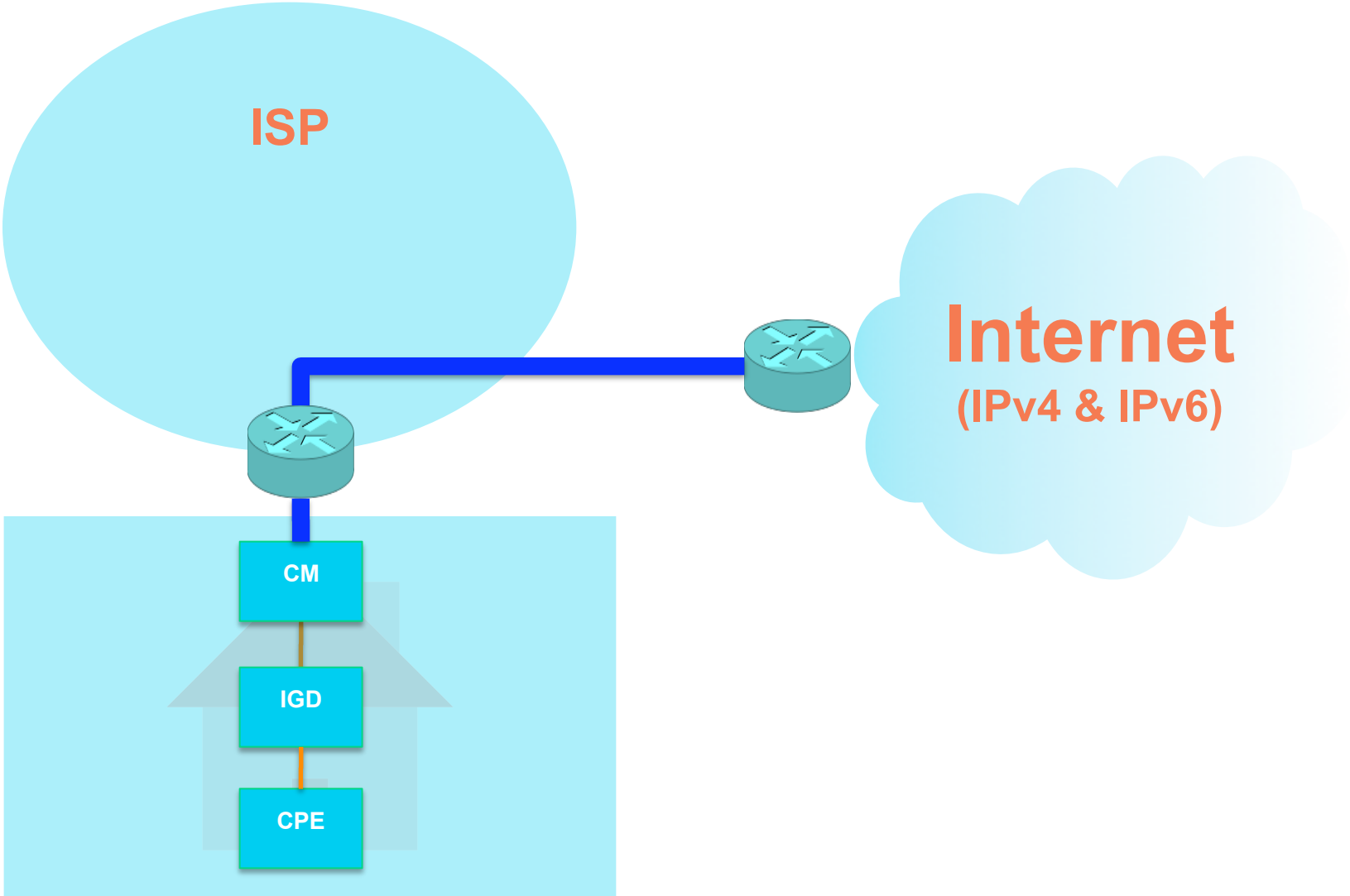
# IPv6 Data Services

- 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

# IPv6 CPE



# IPv6 IGD



# Considerations

- Not all subscriber CPEs support the necessary IPv6 pre-requisites for use in some broadband deployments
- Availability and widespread deployment of IPv6 capable IGDs is lacking
- Challenges associated with routing for delegated IPv6 prefixes should be uniformly addressed

# Considerations (continued)

- 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
- Scale makes a difference
- Deploying IPv6 must not impact existing services

# Content and Services

- 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

# Q&A

- Contact information

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# Backup



# 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