Powering

Next Gen Nationwide Broadband Network Solutions for

Infinite Possibilities.

New Business Opportunities with IPv6 On Next Gen NBN

By
LGA Telecom

Agenda

- Introduction
- Challenges on IPv6 Implementation
- Business Opportunities with IPv6
- LGA IPv6 Experience
- Our Motivation
- Conclusion

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Introduction:

About LGA and Next Gen NBN

About LGA

3000 Companies Choose to Work with LGA because

WE ARE FULLY INTEGRATED
ONE Network.One Management.One Support

WE HAVE PROVEN EXPERTISE
We have been experts in IP centric Network Solutions since 1995

WE ARE TELCO NEUTRAL
We can offer diversity, redundancy and failsafe network services

WE ARE ACCOUNTABLE
We are accountable from consulting, design, implementing and managing your network solutions

National Infocomm Awards 2008
RECOGNISING EXCELLENCE IN INFOCOMM INNOVATION

iDA INFOCOMM DEVELOPMENT AUTHORITY SINGAPORE

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R6 ISP

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Next Generation Nationwide Broadband Network

- All Fibre Ultra-Fast Network
- Symmetrical Upload and Download Speeds
- IPv6 Ready on LGA NGNBN Network
- Nationwide Coverage
- LGA is a NGNBN wholesaler RSP

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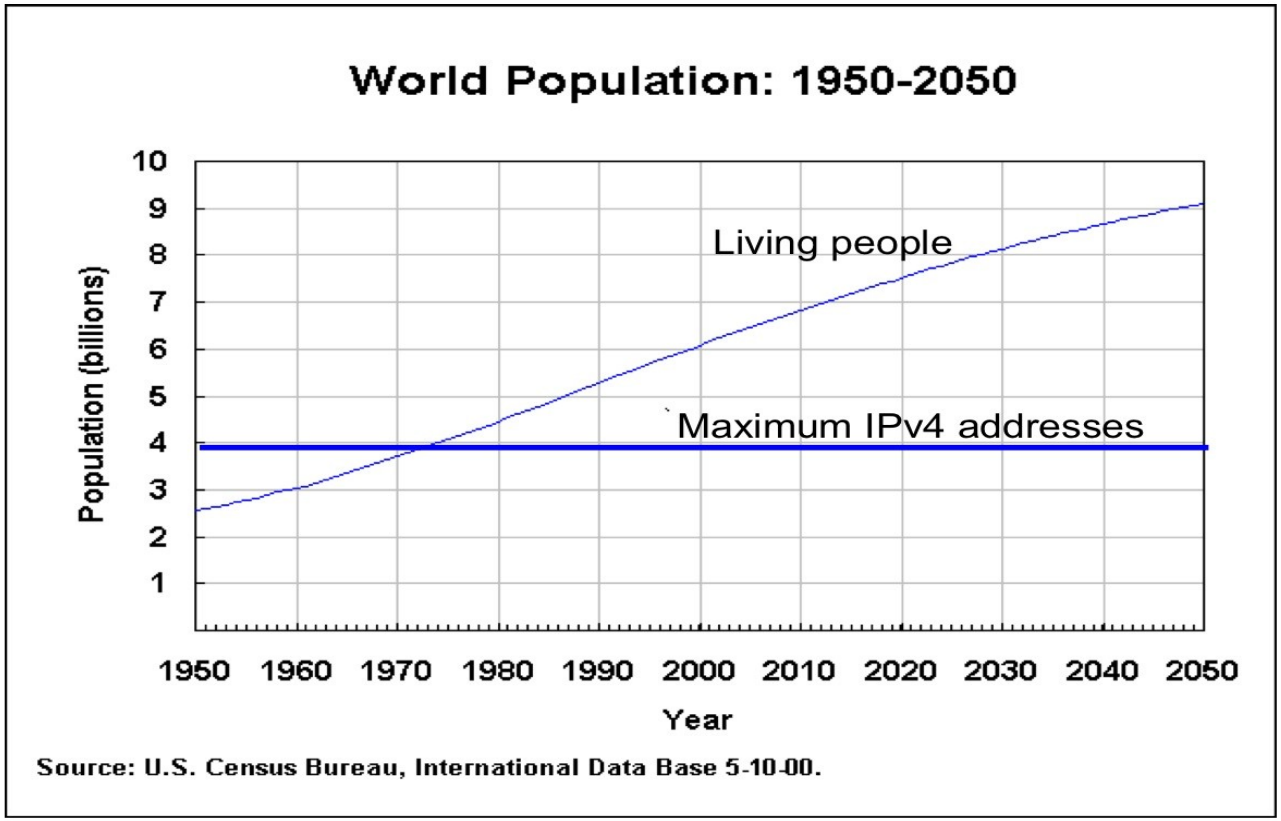
IPv6 Challenges

Shortage of IP addresses



Obviously, having fewer addresses than people is silly

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Implementation Challenges

2 main issues hindering IPv6 deployment:

- **Decision Making**
- **Network and Systems**

Implementation Challenges

1 . Making The Decision

- Lack of desire to move to IPv6 on a voluntary basis.

- Winning people over to support IPv6

- Traffic volumes still not significant compared to IPv4.
  - ➢Therefore not much associated revenue.

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Implementation Challenges

2. Network and Systems

Don’t Break The IPv4 Network

- Need to have IPv6 functionality in the infrastructure.
- Must not affect IPv4 functionality.
- Applications and Scripts still running on IPv4
- Traffic volumes still not significant compared to IPv4.
- Big Bang or Incremental Change to IPv6

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IPv6 Business Opportunities

Internet Business Trends

Increasing Trends in

- Always On
- Number of Devices
- Number of Addresses
- Need for Globally Routable Addresses
- Security
- Mobility

IPv4 and IPv6 Technical Comparison

IPv4	IPv6
Addresses Problems	Unlimited Addresses
NAT	Transparency
Service Limitations	Service Opportunities
Extra Management	OSS Opportunities
IPSec Limited	IPSec Ubiquitous
Mobility Support Limited	Mobile IPv6 Universal

IPv6 Business Opportunities

IPv6 offers:

- Internet Transparency
- Addresses for Mankind
- Equal Opportunity to access data

"Statements means little to most companies where shareholder value is concerned"

How to Increase Revenue/Decrease Cost?

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IPv6 Drivers

Technology Drivers	Business Drivers
• Solve P shortage • Restore P2P Communication • Quality of Service	• Opportunities for new applications • Application function as expected
• Security – IPSec Mandatory	• Network-Based Security
• Auto Configuration • Sensor Networks • Plug and Play Network	• Always On Internet
• Permanent Addresses • Identity • Traceability • Addressability	• Personalization

Increase Revenue

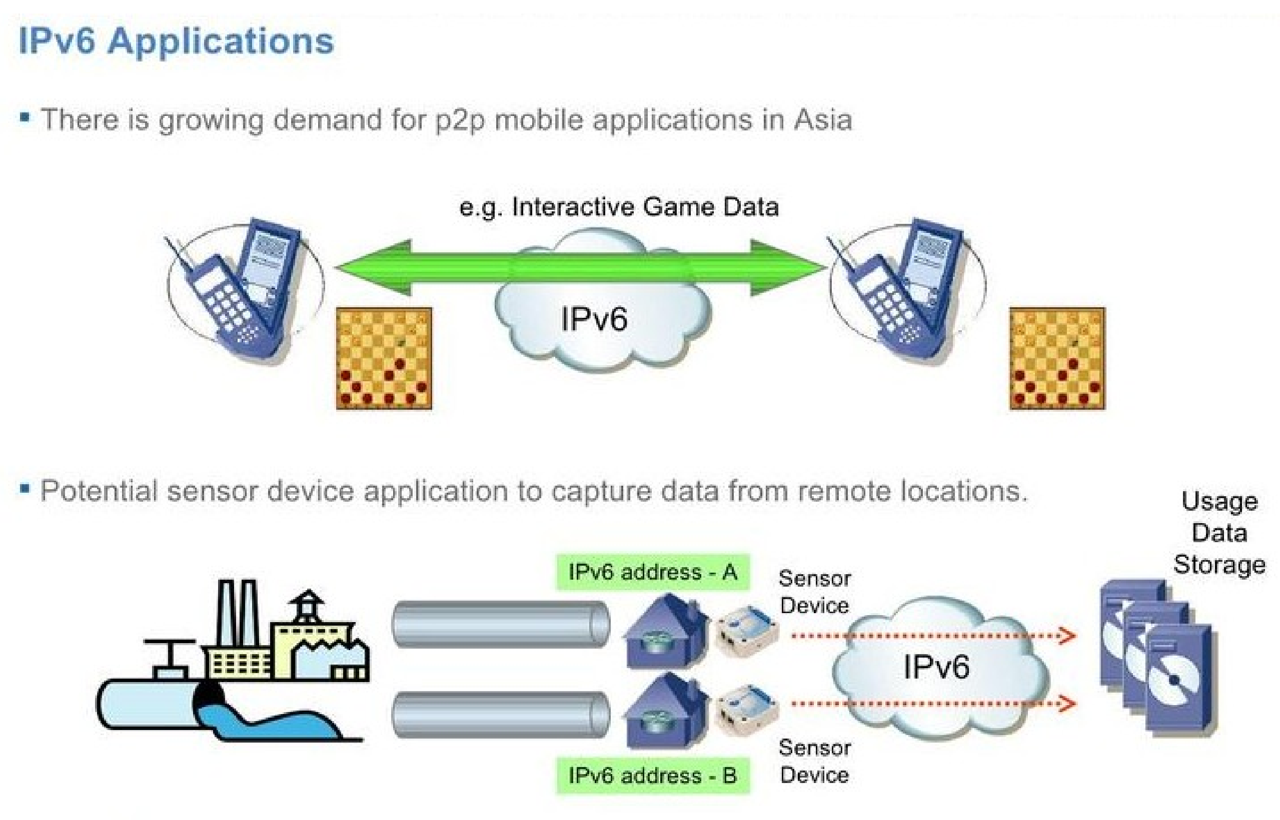
Increase revenues:

- New Customer Categories such as healthcare, automotive, gaming, internet of things, sensor network etc
- New Mobile Applications

More services:

- Voice service substitution
- Innovative P2P applications
- Support new customer categories in Security, Training, Equipment and Consultancy

IPv6 Applications



LGA IPv6 Experience

IPv6 Deployment

In three key phases:

- Providing an IPv6 service at the customer access level
- Running IPv6 within the core infrastructure itself
- Interconnecting with other IPv6 service providers

IPv6 Deployment

1. Deploy IPv6

- Goal – Lower dependency on IPV4 addresses to manage end devices
- Technologies – Native IPV6, Dual Stack

2. Maintain IPV4 Service after IPV4 Address Exhaustion

- Goal – Provide IPV4 Service without unique IPV4 address to customers
- Technologies – NAT444/DS Lite/NAT64

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IPv6 Transition Stages

Stage I

Stage II

IPv6 Deployment Strategy

Native Dual-Stack

Gradual deployment of IPV6 with IPV4

IPv6 Exhaustion Strategy

- DS-Lite
  IPv4 over IPv6
- NAT444
  Double NAT
- NAT64
  Greenfield IPv6 Networks

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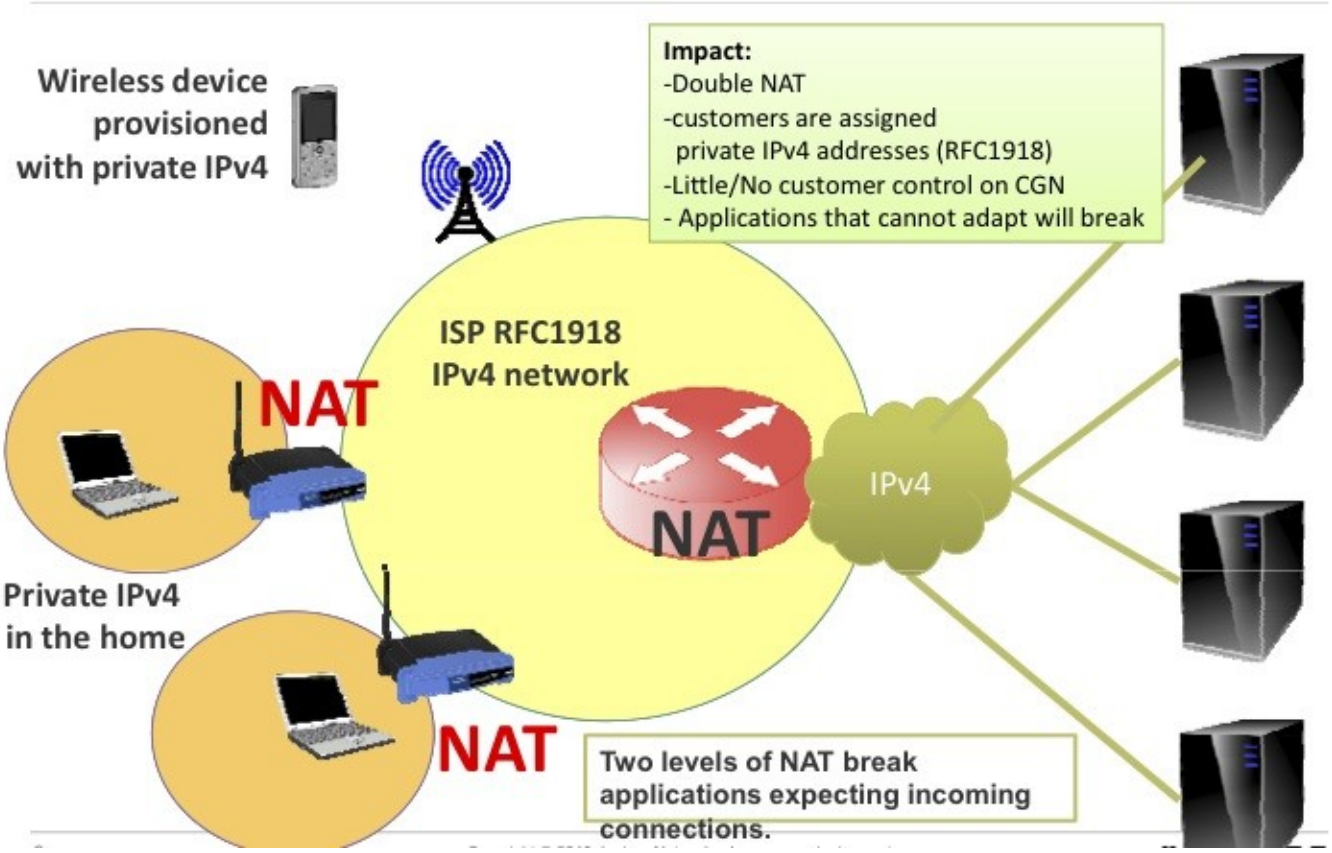
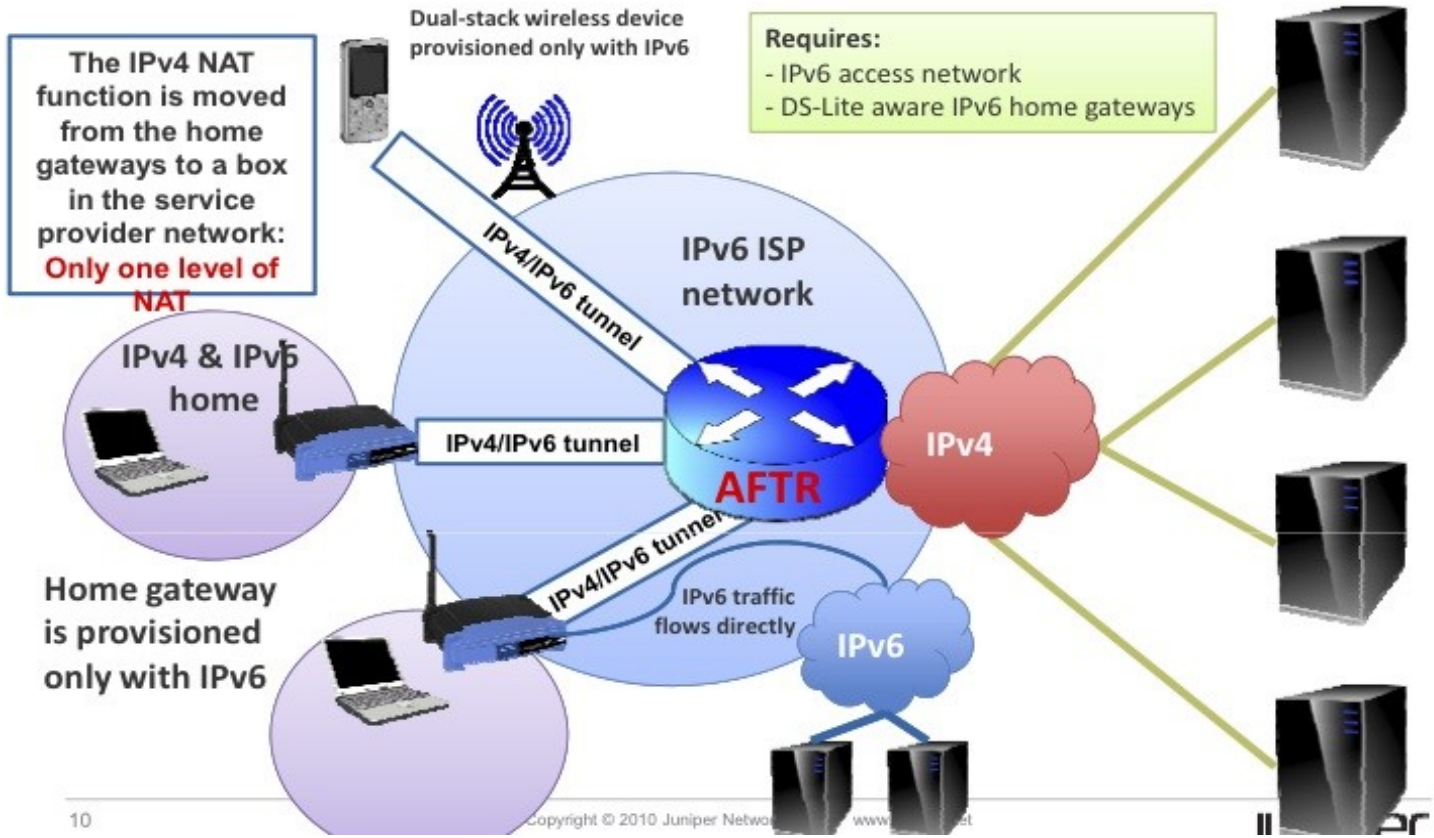
Evaluating IPv6 Technologies

Exhaustion Strategy 1
Carrier Grade NAT : Double IPV4 NAT (NAT444)



Exhaustion Strategy 2
DS-Lite : Native IPV4 + IPV6 Overlay Service



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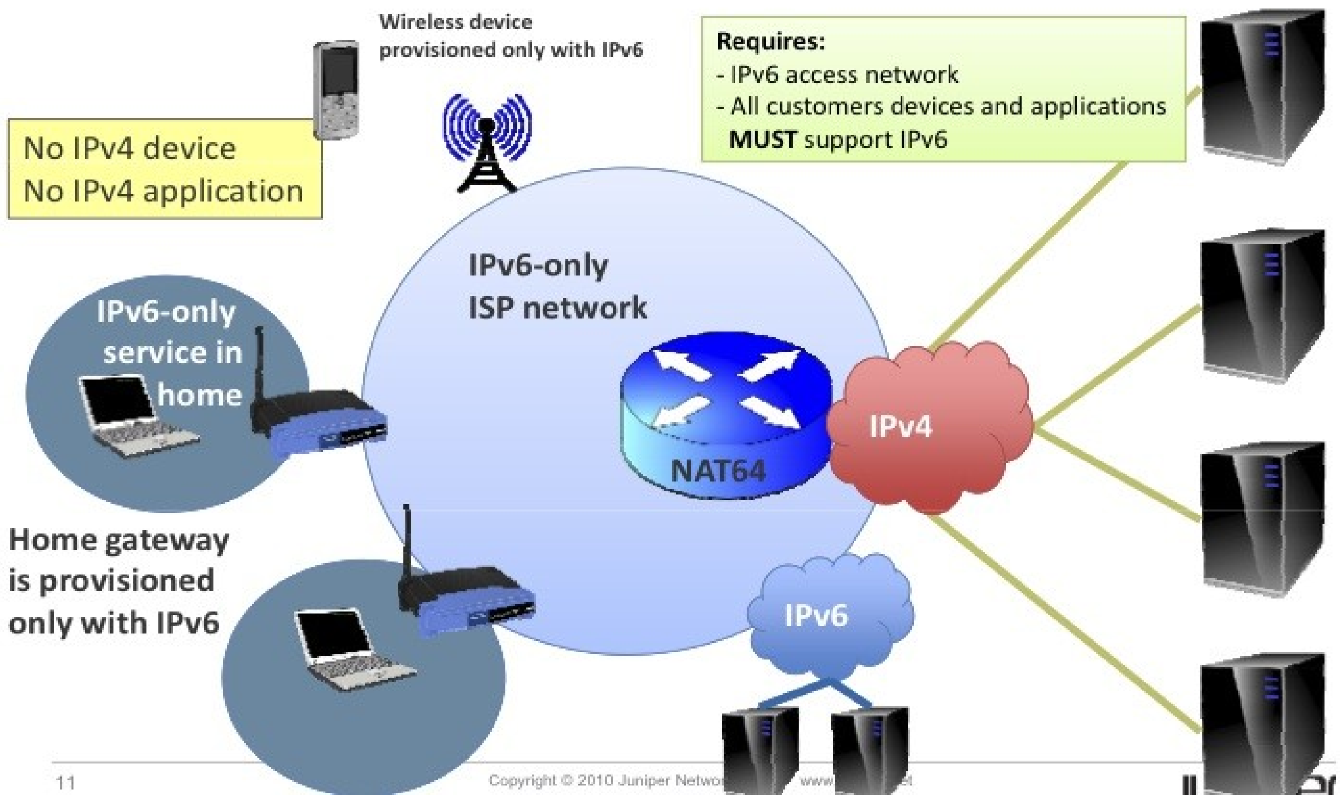
Exhaustion Strategy 3
NAT64: IPV6-Only for Green Field Deployments



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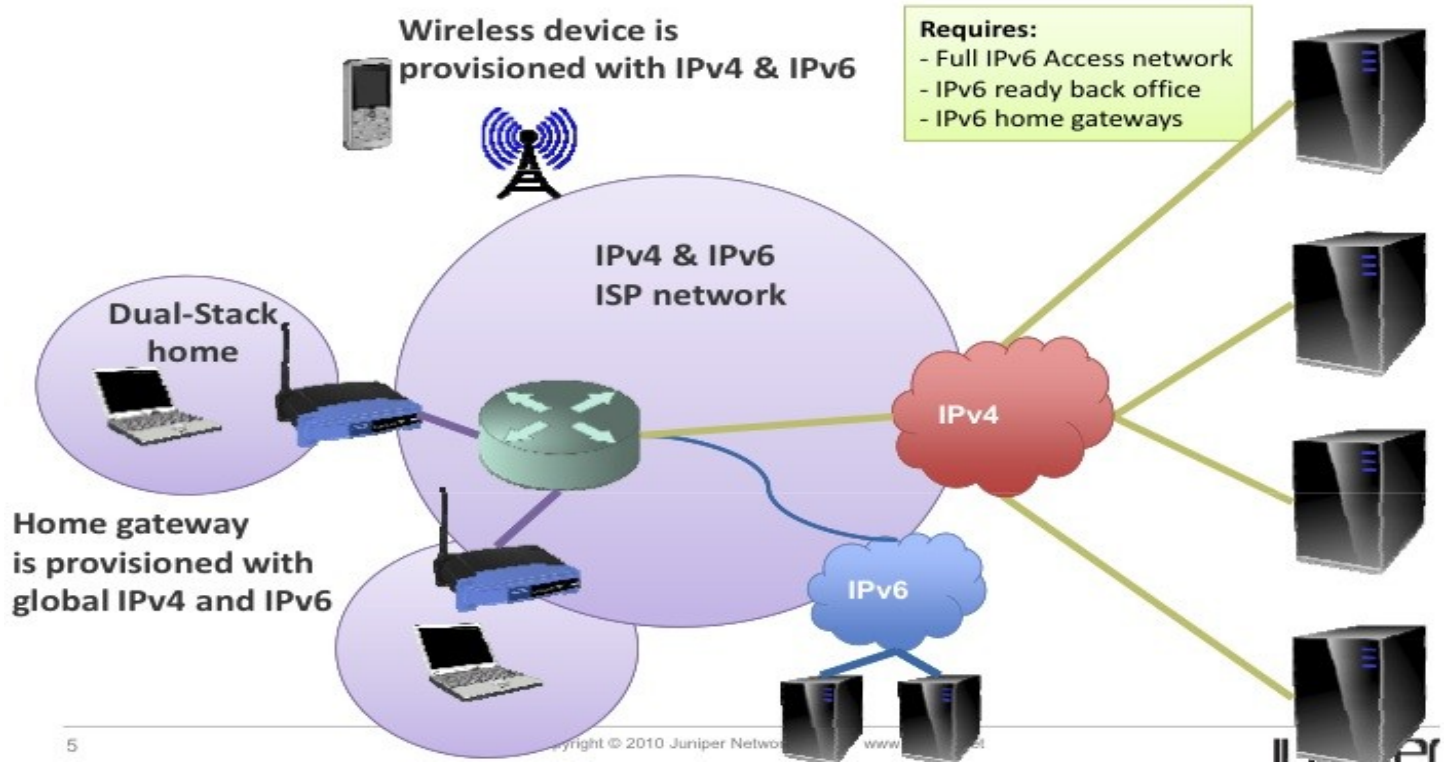
Deployment Strategy
Dual-Stack : Native IPV6 and IPV4



Comparison of IPv6 Technologies

Technology	Benefits	Limitations
Double IPv4 NAT (NAT444)	Easy to deploy	Applications may break
IPv4 over IPv6 Overlay (DS-Lite)	Offer initial IPv6 service. Minimum investment	Complex to manage. DS-Lite is not widely supported on CPE
IPv6 Only (NAT64)	Easy to maintain.	Need customer to support IPv6 only.
Native IPv4 + IPv6 (Dual Stack)	Easy to implement with mixture of IPv4 and IPv6 applications	Complex dual management of routing protocols

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Our Motivation

Our Motivation

- Visibility
- Early Mover Advantage
- Differentiator in the Marketplace
- IPv6 Support in winning bid
- Stimulate IPv6 traffic growth

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Start Thinking About…

- Where do you *really* see IPv6 going?
- Do you think you will have to deliver IPv6?
- Who in your organization knows about IPv6?
- Start with a Trial Deployment

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IPv6 Trial Deployment

- Educate IT staff
- Verify transit connectivity for IPv6
- Build list of products and applications and check IPv6 support plan
- Create IPv6 test-bed subnet.
- Verify support of IPv6 firewalling.
- Enable AAAA records and dual stack access to DNS.
- Create test IPv6 web server.

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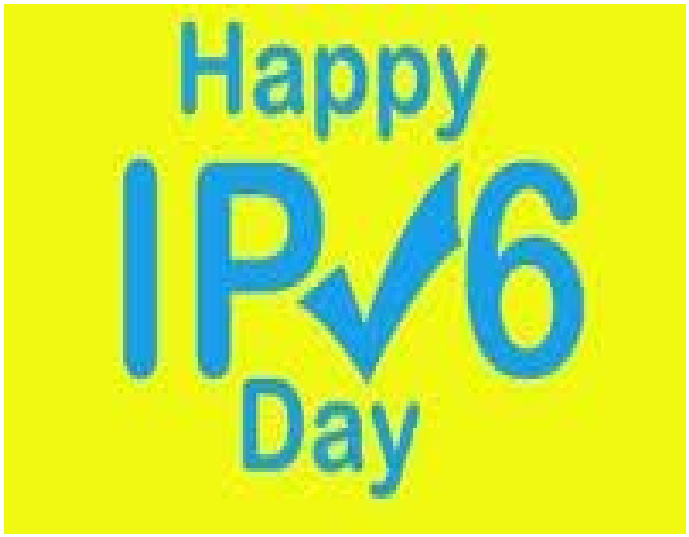
Conclusion

Every organization should:

- Understand IPv6 today with Trial Deployment to see how it affects technical architecture and business
- Look for niche commercial deployment within next 12 months
- Expect IPv6 to seriously affect their businesses in next new years



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