



Enterprise IPv6 – Going Beyond the Edge

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Program Agenda

- About Oracle
- IPv6 on the Edge
- Killer App???
- IPv6 @ Oracle
- Enterprise IPv6
- Lessons Learned

About Oracle Corporation

You may have seen us?



About Oracle Corporation

And you may have heard of us?

- 115,000 Employees
- 25,000 Partners
- 390,000 Customers
- 15,000,000 Developer Community
- Hardware Products
- Software Products
- On-Demand Services / Solutions

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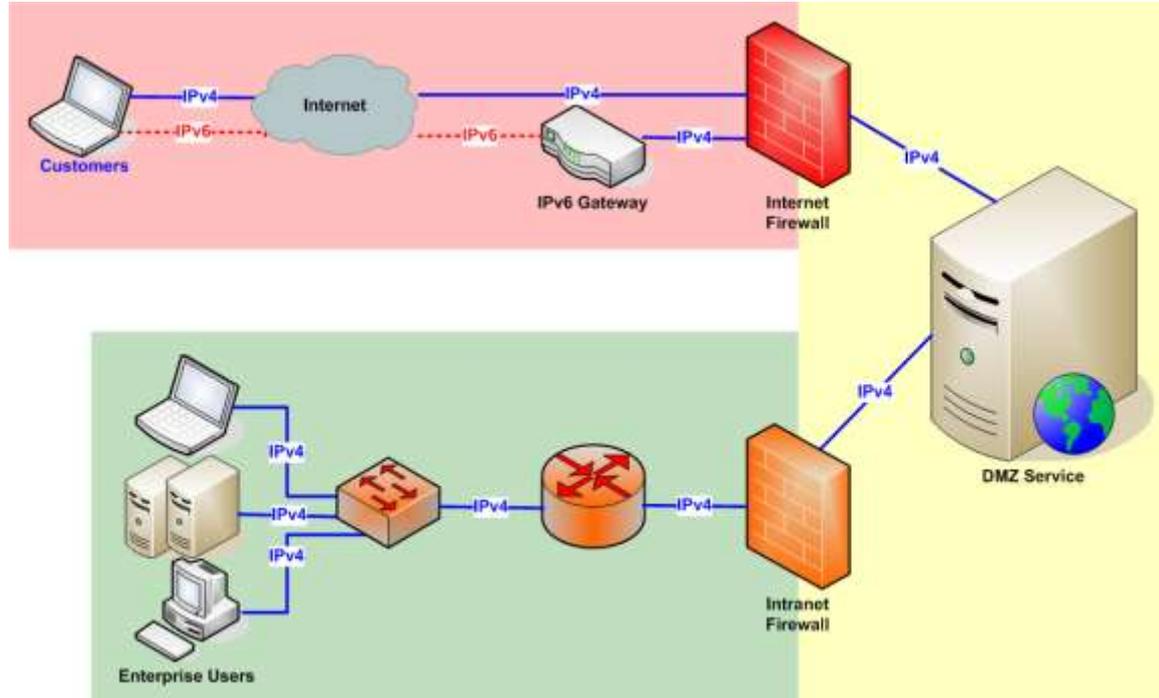


Oracle Fact Sheet 9/2012 - <http://www.oracle.com/us/corporate/oracle-fact-sheet-079219.pdf>

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Where to begin???

IPv6 on the Edge



The Current Trend

IPv6 on the Edge

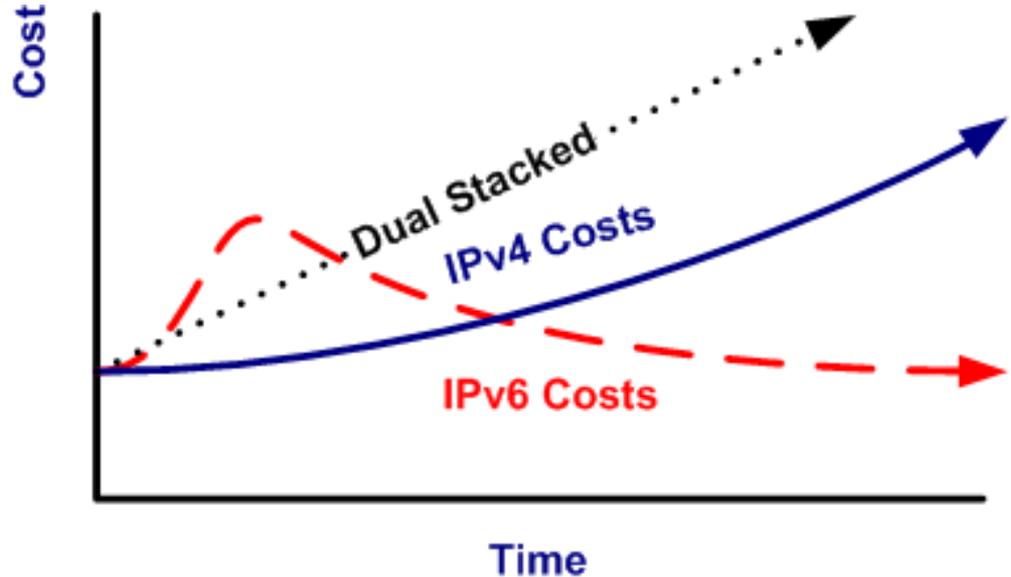
- IPv4 Routeable Space
- RFC 1918 Space / NAT Investment
- IPv6 Address for IPv6 Gateway

Testing the waters...

1. IPv6 Access for Internet Users
2. Minimal Changes
3. Minimal Benefit

Killer App???

- Customer Delivery
- Scalability
- Cloud Computing
- Enable Automation
- Drive Lower Cost

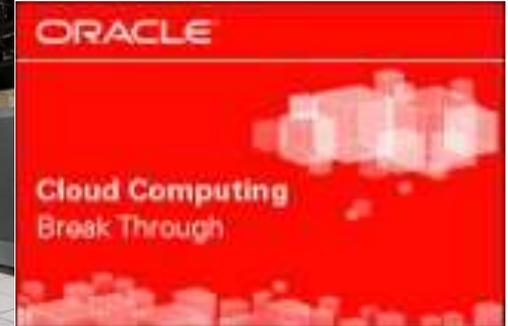


How long will you continue to invest in IPv4?

Consuming Addresses

Under the Waterline

- Higher System Density
- Virtual Solutions
- Relocatable Services
- Cloud Computing
- Network Scalability
- Internet of Things



Scale to 8 Racks by Just Adding Cables
Full Bandwidth and Redundancy



Scale to more than 8 Racks by adding InfiniBand switches

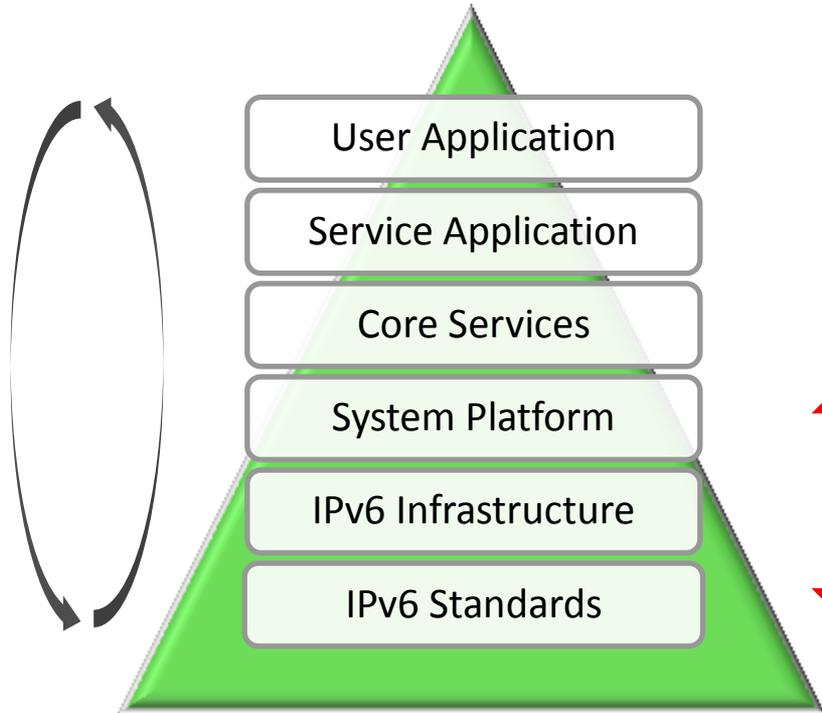
IPv6 @ Oracle

IPv6 Program

- Master Program
 - IPv6 Adoption Strategy
 - Multiple Strategic Projects
- Dual Stacked IPv6/IPv4 Architecture
 - ✓ Adopt IPv6.
 - ✓ Phased approach rollout.
 - ✓ Leverage Technology Refresh
- Build and Document Knowledge
- Identify IPv6 native opportunities.
- End State: IPv6 Internal w/ Dual Stack External (Customers).

IPv6 Adoption

Evolving 30+ years of networking



- User Applications
 - Custom In House Apps
- Core Services
 - Desktop, Help
- Core Services
 - DNS, DHCPv6, NTP, Monitoring
 - Proxy, VPN, WiFi
- Linux / Win 7 / Solaris / Mac / VM
- IPv6 Transport
 - Core / Routers / Switches
- IPv6 GIT Standards

Enterprise IPv6

Deploying from the inside to outside.

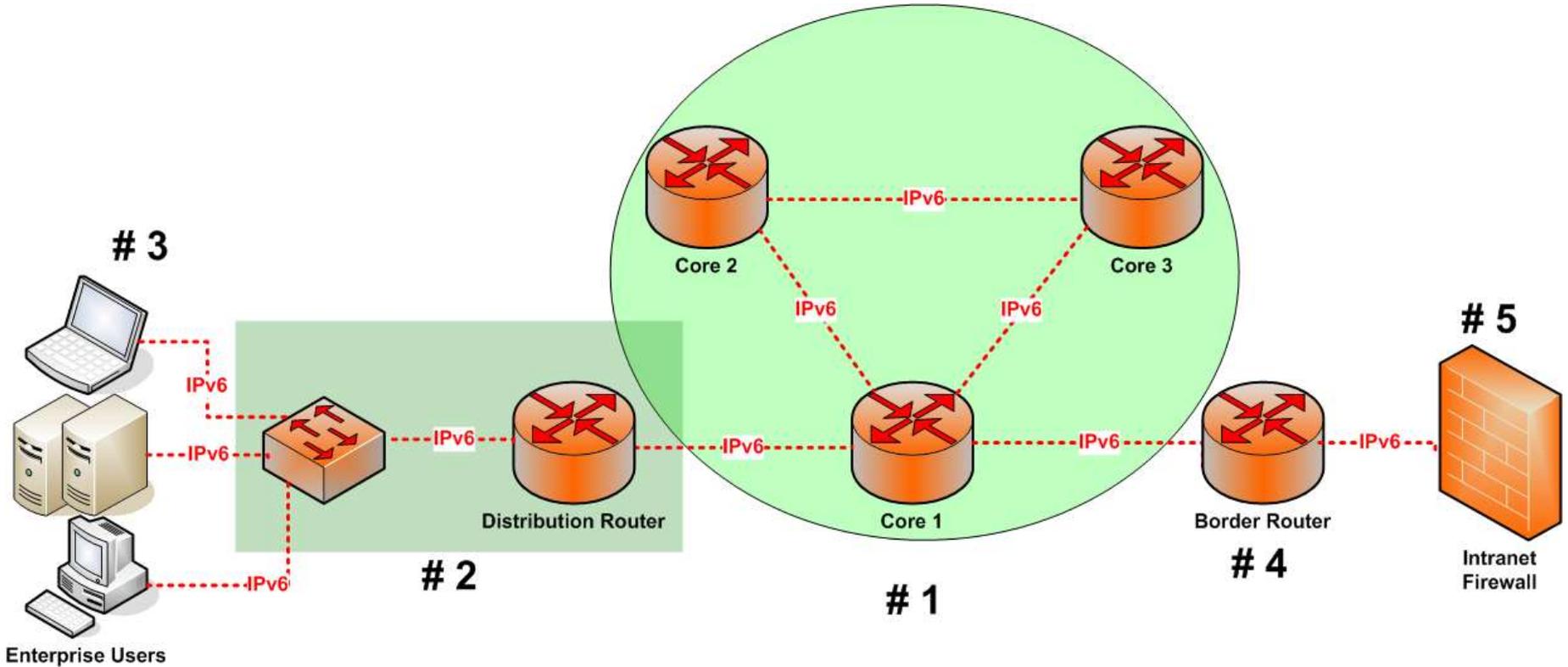
1. IPv6 Address Plan (PI / PA / ULA)
2. IPv6 Payload vs Transport
 - DNS, Monitoring, Netflow, etc...
3. Deploy to Core
 - Small subset / finite resources
4. Expand to DC
 - Organic growth out
5. Enable Remote Sites
 - Diverse environments



Sample Address Plan

Site	2001	:	0db8	:	0000	::	/48		
Internal/Researved	2001	:	0db8	:	0000	:	0000	::	/50
Internal	2001	:	0db8	:	0000	:	4000	::	/50
External/Researved	2001	:	0db8	:	0000	:	8000	::	/50
External	2001	:	0db8	:	0000	:	b000	::	/50
Buiding	2001	:	0db8	:	0000	:	0x00	::	/52
Floor	2001	:	0db8	:	0000	:	00xx	::	/56
VLAN	2001	:	0db8	:	0000	:	0000	::	/64

Focus on the Core



IPv6 Data Centers

Create a blueprint...

- Identify the easiest to tackle first.
 - DC Age, Architecture, Standards
 - Staffing Level, Location
- Staff Training.
- Inventory HW & SW.
- Apply IPv6 Address Plan.
- Test Deployment (couple vlans).
- Execute across Data Center.



IPv6 Desktops

Make it scalable...

- Client Considerations
 - SLAAC vs DHCPv6, Why not both???
 - Security, Security, Security...
- IPv6 VPN Configuration
- IPv6 WiFi Adoption
- Application Considerations



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Lessons Learned

- Enlist champions.
- Publicize Wins.
- Identify new opportunities.
- Small steps, achievable milestones.
- Build on successes, recycle and reuse.
- Overcome IPv4 thinking, design for the network.
- Get over the hump...

Remember there is a safety net...



Lessons Learned – Cont.

IPv6 as a Game Changer...

- Require IPv6 from your vendors
 - Not all IPv6 is created equal.
 - Supports doesn't mean it works in your environment.
 - Vendors that deliver IPv6 may lack IPv6 experience.
 - Service providers still lack support in many areas.
 - Formalize requirements and drive delivery.
 - Be cautious of middle layers lagging support of IPv6.
 - Verify IPv6 Support, take the Missouri approach “Show Me!”
 - Best practices are not always followed, and may differ.

Remove IPv6 Obstacles

1. Define an IPv6 Adoption Policy.
2. Create a target for IPv6 connections.
3. Centralize training and documentation.
4. Try it on the Network.
 - Linux, Solaris, VirtualBox,
 - Windows, Mac
5. Enable IPv6 support using IPv4 transport.
6. Adopt IPv6 for existing environments.



What we've see so far...

1. Scanning Host `2001:0db8:beef:café:0123:4567:89ab:cdef` but log shows `2001:0db8:beef:café:0123:4567:89ab:cd`
2. IPv6 Address Config →
3. What's address `2001:db8::` 😬
4. Identity Crisis, what's my address?
5. I see you got a /32, let's scan it...



What we've see so far...

6. IPv6 implement in SW.
7. Router Memory
8. Why is IPv6 running?
9. Let's disable Multicast.
10. DHCP Relay / NTPv4

```
Administrator: C:\Windows\system32\cmd.exe
C:\Users\Administrator>ipconfig

Windows IP Configuration

Ethernet adapter Local Area Connection:

    Connection-specific DNS Suffix  . : 
    Link-local IPv6 Address . . . . . : fe80::d9e:bed6:4917:c7df%12
    IPv4 Address. . . . . : 10.0.1.114
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . . : 10.0.1.1

Tunnel adapter Local Area Connection* 11:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix  . : 

Tunnel adapter isatap.{59E12CBD-0FED-41CF-A684-6A685829ED37}:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix  . : 

C:\Users\Administrator>
```

What we've see so far...

11. My network address is

42540766411282592856903984951653826561

12. Feature Parity Myth...



Public IPv6 at Oracle

- www.oracle.com/us/technologies/ipv6/index.html
- blogs.oracle.com/ipv6
- www.ipv6.mysql.com





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