ATEC – Workshop IPv6

Microsoft Status on IPv6

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IPv6 - History

1998 - Availability of an IPv6 implementation from Microsoft Research.

March 2000 - Technology preview released for Windows 2000-based computers

October 2001 - Windows XP released with a developer preview IPv6 stack and some components of the system enabled for IPv6

September 2002 - Windows XP Service Pack 1 released with the first edition of a production IPv6 stack and some IPv6-enabled components.

March 2003 - Windows Server 2003 was released with a production IPv6 stack and some IPv6-enabled components

July 2003 - Advanced Networking Pack for Windows XP released. Included the IPv6 Internet Connection Firewall, a Teredo client, and support for Windows Peer-to-Peer Networking.

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IPv6 – History II

August 2004 - Windows XP Service Pack 2 released. Included the Teredo client, support for Windows Peer-to-Peer Networking and integrated IPv6 traffic support with the new Windows Firewall (replacing the IPv6 Internet Connection Firewall).

March 2005 - Windows Server 2003 Service Pack 1 released. Included the additional IPv6 features provided with Windows XP Service Pack 2.

July 2005 - Beta 1 of Windows Vista™ and Beta 1 of Windows Server 2008 released. Included the Next Generation TCP/IP stack, an integrated IPv4/IPv6 stack in a dual IP layer architecture

November 2006 - Windows Vista released

February 2008 - Windows Server 2008 released.

July 2009 - Windows 7 and Windows Server 2008 R2 released

…

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IPv6 – Strategy

High volume products - for the foreseeable future, Microsoft (as most manufacturers) will produce systems supporting both IPv4 and IPv6, so that if connections are not possible using IPv6 they can fall back and succeed using IPv4

Overall goal - to ensure a smooth transition and deployments where updated applications can take advantage of the new protocol, without breaking existing applications

Developer/Ecosystem care - New Windows APIs defined to specifically isolate the legacy applications from unintentional exposure to protocol differences.

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IPv6 – Adoption increase tactics

- CEC : Common Engineering Criteria
  - Compliance criteria list (revised annually) for server products.
  - Management Packs, Powershell commandlets, **IPv6 support**, …
  - Mandatory, but an exemption process exists ☹

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IPv6 – Adoption increase tactics II

IPv6 Dependent Solutions

- Peer to Peer API set
- Windows 7 Homegroup
- Parts of Remote Assistance
- Windows 7 DirectAccess
- Windows Meeting Space (and other applications that rely on the Windows Peer-to-Peer Networking platform or the Teredo transition technology)

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IPv6 – Adoption increase tactics III

Consulting Services!

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Microsoft | Services

Jun 8, 2011

MAXIMIZE YOUR MICROSOFT

Agenda

- IPv6: What Is It And Why Is It Important?
- Practical Scenarios Around Deploying IPv6
- The Pros and Cons of Deploying IPv6 and of IPv6/IPv4 Co-existence
- Myths About IPv6
- Concerns About IPv6
- Next Steps
- Conclusion
- Q & A

IPv6 introduction

A Brief Outline of IPv6

IPv4 is the current Internet carrier

Internet is growing beyond the limits of IPv4

IPv6 Designed by the IETF to Address IPv4 shortcomings

IPv6 offers:

- **Near unlimited addresses and subnet capability (no boundary to network growth)**
- **Standardized support for Internet Security Protocols (security built right in)**
- **More efficient node (host) discovery (rapid and automatic connectivity)**

IPv6 introduction

Why Is It Important ?

IPv6 introduction: Why

IPv4 Address Depletion

IANA
- Exhaustion in Feb. 2011

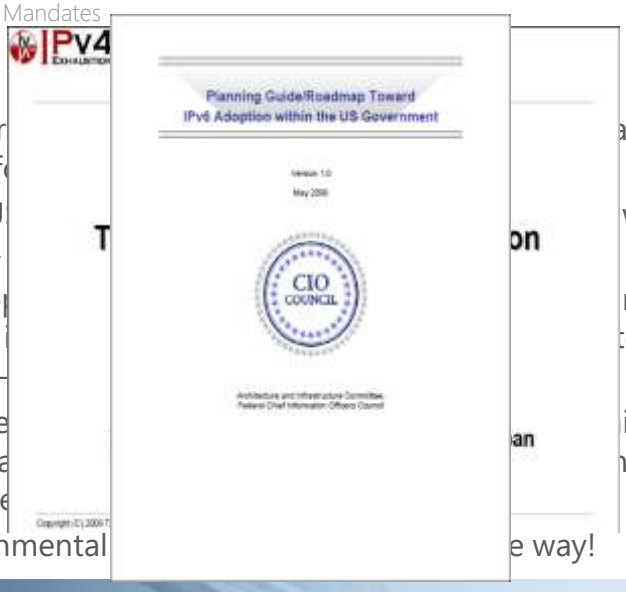
RIRs
- Will exhaust 2 to 8 months later
- APNIC / ARIN already in the red

ISPs
- It will depend

Customers
- Will feel shortage starting

IPv6 introduction: Why is it Important?

Government Mandates



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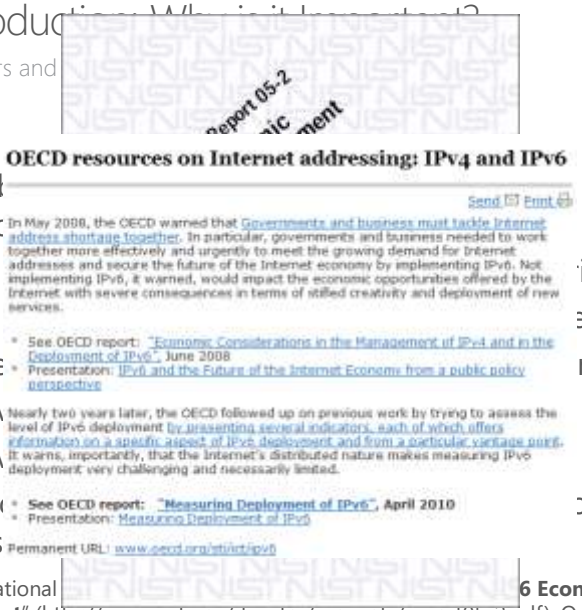
IPv6 introduc

Business Drivers and



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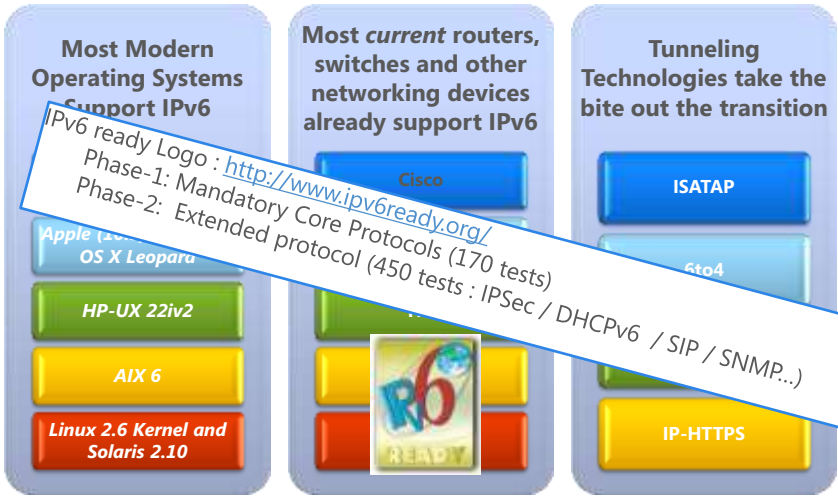
* RTI International **6 Economic Impact Assessment**" (http://www.nist.gov/director/prog-ofc/report05-2.pdf), October, 2005

Practical Scenarios Around Deploying IPv6

- The Widely Distributed and Remote Workforce
- Reduction of Risk and Overhead when Merging with Other Networks
- Mandate to Provide IPv6 Capable Services
- Long-Term Corporate Network Planning
- Controlling IPv6 Within Existing Corporate Infrastructure
- Heightening the Security Posture

Pros and Cons of Deploying IPv6

IPv6 Deployment Landscape – Overall



Pros and Cons of Deploying IPv6

IPv6 Deployment Landscape – Microsoft's Commitment

- IPv6 ready
  - Phase 1
    - Windows Se
    - Windows C
  - Phase 2 (core p
    - Windows Vi
    - Windows 7
    - Windows Se
    - Windows m

- CEC : Common Engineering Criteria
  - Compliance criteria list (revised annually) for server products.
  - Management Packs, Powershell commandlets, **IPv6 support**, …
  - Mandatory, but an exemption process exists
  - http://www.microsoft.com/cec/en/us/default.aspx

Pros and Cons of Deploying IPv6

IPv6 Deployment Landscape – Microsoft IPv6-Dependent Features and APIs

- Peer to Peer API set
- Windows 7 Homegroup
- Parts of Remote Assistance
- Windows 7 DirectAccess
- Windows Meeting Space or any application that relies on the Windows Peer-to-Peer Networking platform or the Teredo transition technology

Pros and Cons of Deploying IPv6

Microsoft KB Articles (1/2)

KB	Title	Comment
923398	How to configure an IPv6 resource for a SQL Server 2005 cluster on a Windows Server 2008-based computer	
975951	You receive an error message when you set up a SQL Server 2008 failover cluster on a subnet that contains only IPv6 addresses	SQL CU7 to correct
963042	IPv6 network connectivity problems occur on a Windows Server 2008-based computer when the Network Load Balancing feature is enabled	Fixed
2000919	Network Load Balancing (NLB) can not connect with IPv6 addresss on Windows Server 2008	Fixed in Windows 2008 R2
947050	Advanced resource configuration in Windows Server 2008 failover clusters	Info
941754	Incoming messages may be rejected by the queue manager on the cluster after you configure the clustered instance of Message Queuing to use HTTP messaging in Windows Server 2008	IPv6 lookup zone
969256	The validation fails when you run a cluster validation wizard for a Windows Server 2008 cluster	Teredo should be disabled
947044	When you use a cluster name instead of a node name to make a connection in Windows Server 2008, the DHCP MMC responds very slowly	IPv6 Reverse lookup for the cluster name

Pros and Cons of Deploying IPv6

Microsoft KB Articles (2/2)

KB	Title	Comment
980054	Recommended hotfixes and updates for Windows Server 2008 R2-based server clusters	Info
978309	IPv6 transition technologies, such as ISATAP, 6to4 and Teredo do not work on a computer that is running Windows Server 2008 R2 Server Core	
976571	Stability update for Windows Server 2008 R2 Failover Print Clusters	
981953	An incorrect IP address is returned when you ping a server by using its NetBIOS name in Windows Server 2008 or in Windows Server 2008 R2	Covers both IPv4 / IPv6
2018583	Windows 7 or Windows Server 2008 R2 domain join displays error "Changing the Primary Domain DNS name of this computer to "" failed...."	Display error due to lack of Netbios (IPv4 or IPv6)
944007	You cannot access shares by using an IPv6 address that has a colon (:) character in the command	IPv6 litterals explanation
929852	How to disable certain Internet Protocol version 6 (IPv6) components in Windows Vista, Windows 7 and Windows Server 2008	
2014131	Microsoft iSCSI Initiator never reconnects after failing and re-establishing a path to iSCSI storage when Multiple Connected Sessions and both IPv4 and IPv6 addresses are configured	Switch to IPv4

Pros and Cons of Deploying IPv6

Pros

- End-to-End Connectivity Solutions
- Greater Network Scalability
- Prepares Network for Future Developments
- Greater Infrastructure Supportability
- Support for IPv6-Only Apps and Services
- Easily Obtainable Global Address Space

Pros and Cons of Deploying IPv6

Disadvantages of Not Deploying IPv6

- Higher TCO
- Lower ROI
- Reduced Capability to Deploy End-to-End Solutions
- Decreased Scalability
- Decreased Ability to Deploy New Technologies
- Reduced Communications Capabilities

Top 10 Myths About IPv6

Dispelling the Most Prevalent Un-Truths

Top 10 Concerns About IPv6

Addressing Valid Issues

Next Steps

How Can Microsoft Help?

Conclusion

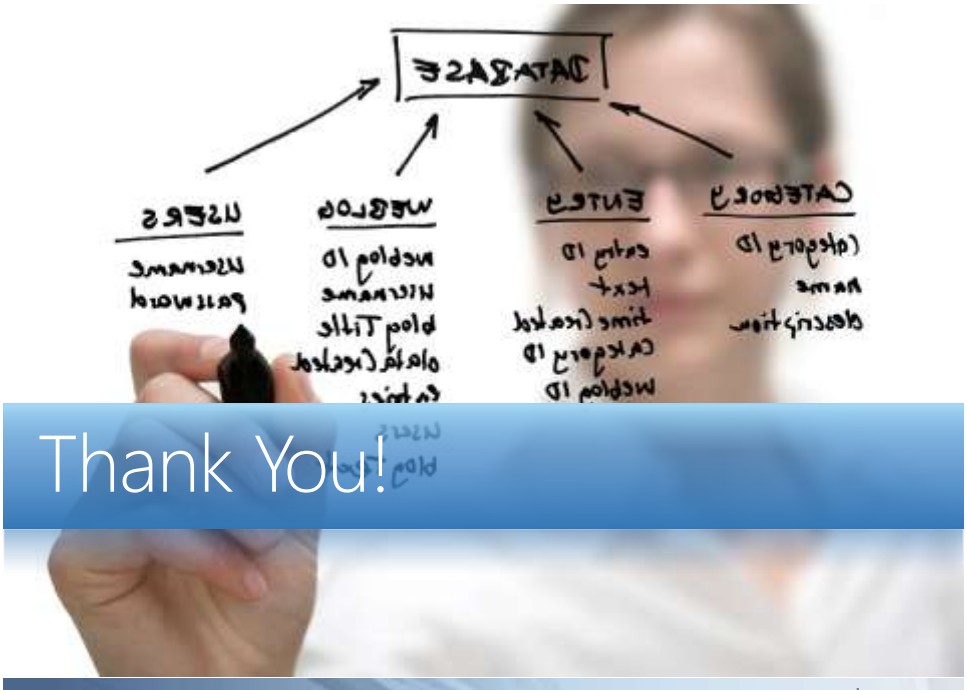
- In the new decade the demands on the Internet and internetworking technology will continue to grow

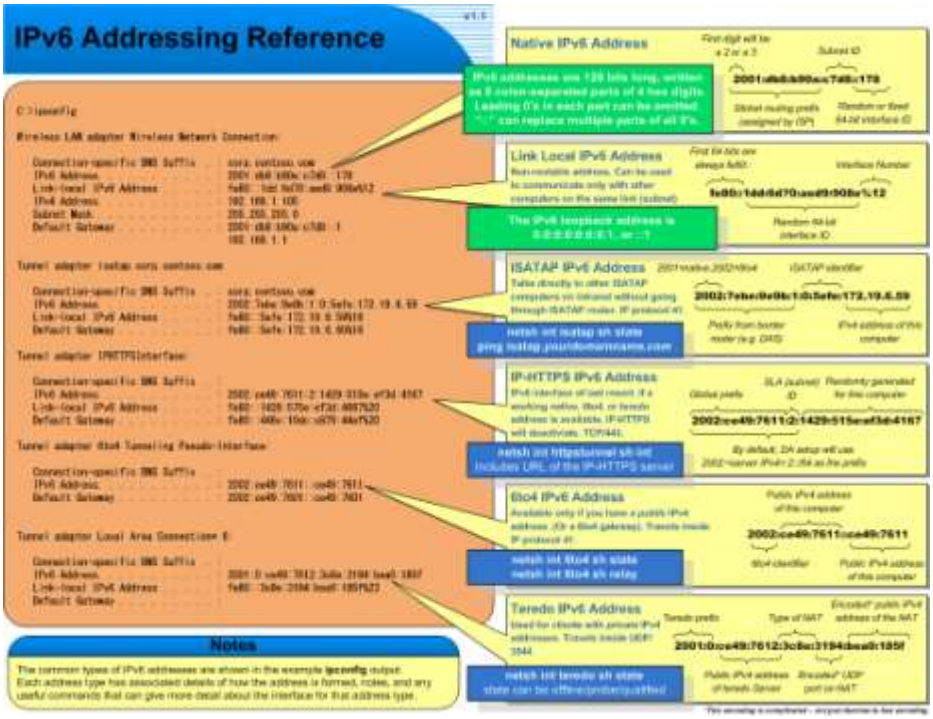
"Implementing IPv6 has consumed less than 1 percent of our IT budget, and the IT budget is only a small part of the overall corporate budget. These costs are modest compared to the expected benefits."

Fred Wettling, Bechtel Fellow and Technology Strategy Manager, Bechtel Corporation

References

- ARIN Board Resolution: https://www.arin.net/knowledge/about_resources/v6/v6-resolution.html
- Planning Guide\Roadmap Toward IPv6 Adoption within the US Government: http://www.ipv6council.de/fileadmin/documents/Planning_GuideRoadmap_Toward_IPv6_Adoptionin_USG_May_2009_final1.pdf
- Action Plan for the Deployment of Internet Protocol version 6 (IPv6) in Europe: http://ec.europa.eu/information_society/policy/ipv6/docs/european_day/comm-ipv6-final_en.pdf
- Action plan and Milestone Toward IPv4 Address Exhaustion (Japan): http://www.kokatsu.jp/blog/ipv4/en/data/091005_v4exh_actionplan_en.pdf
- IPv6 Economic Impact Assessment (Report to the US Department of Commerce): http://www.nist.gov/director/prog-ofc/report05-2.pd
- IPv6 Ready Logo Program: http://www.ipv6forum.com/dl/white/IPv6_Ready_Logo_White_Paper_Final.pdf
- Microsoft 's TechNet IPv6 Site: http://technet.microsoft.com/en-us/network/bb530961.aspx





Controlling IPv6

- Described in KB 929852
- All components behavior in :
  - HKLM\SYSTEM\CurrentControlSet\Services\tcpip6\Parameters\DisabledComponents

Behavior	DisabledComponents value
Disable all tunnel IPv6 interfaces	0x1
Disable 6to4	0x2
Disable ISATAP	0x4
Disable Teredo	0x8
Disable Teredo and 6to4	0xA
Disable native IPv6 interfaces.	0x10
Disable all IPv6 interfaces except loopback interface	0x11
Use IPv4 instead of IPv6 in prefix policies	0x20
Disable all IPv6 components, except the IPv6 loopback, use IPv4 instead of IPv6	0xFF