Windows Vista™ and IPv6:
Developing Seamless Applications

Mátyás Safranka

Senior Consultant
Enterprise Services
Microsoft Corporation

Topics

- Roadmap

- Next Generation Networking in Vista and Longhorn

- Seamless Applications

- Migration to IPv6

- IPv6@Microsoft

ROADMAP

Why is IPv6 Important for Microsoft?

- **PC Market Growth**: In last 20 years worldwide base of PC users grew to more than 600 million. By 2010, the market is expected that to grow to 1 billion.

- **Non-PC Consumer Electronics**: The opportunity is virtually unlimited to integrate the richness and intelligence of the PC world with everyday devices such as mobile phones, handheld devices, home entertainment, and TV.

- **Entertainment**: There is significant growth opportunity in delivering compelling entertainment experiences in key scenarios such as music, TV, movies, photos, and games.

- **Communications**: Broadband and wireless technology is increasing the amount of time people spend online. Younger users want communications experiences to build their social network on any device. Professionals and information workers need integrated, secure functionality that helps them manage their personal and professional lives.

IPv6 supports in Windows

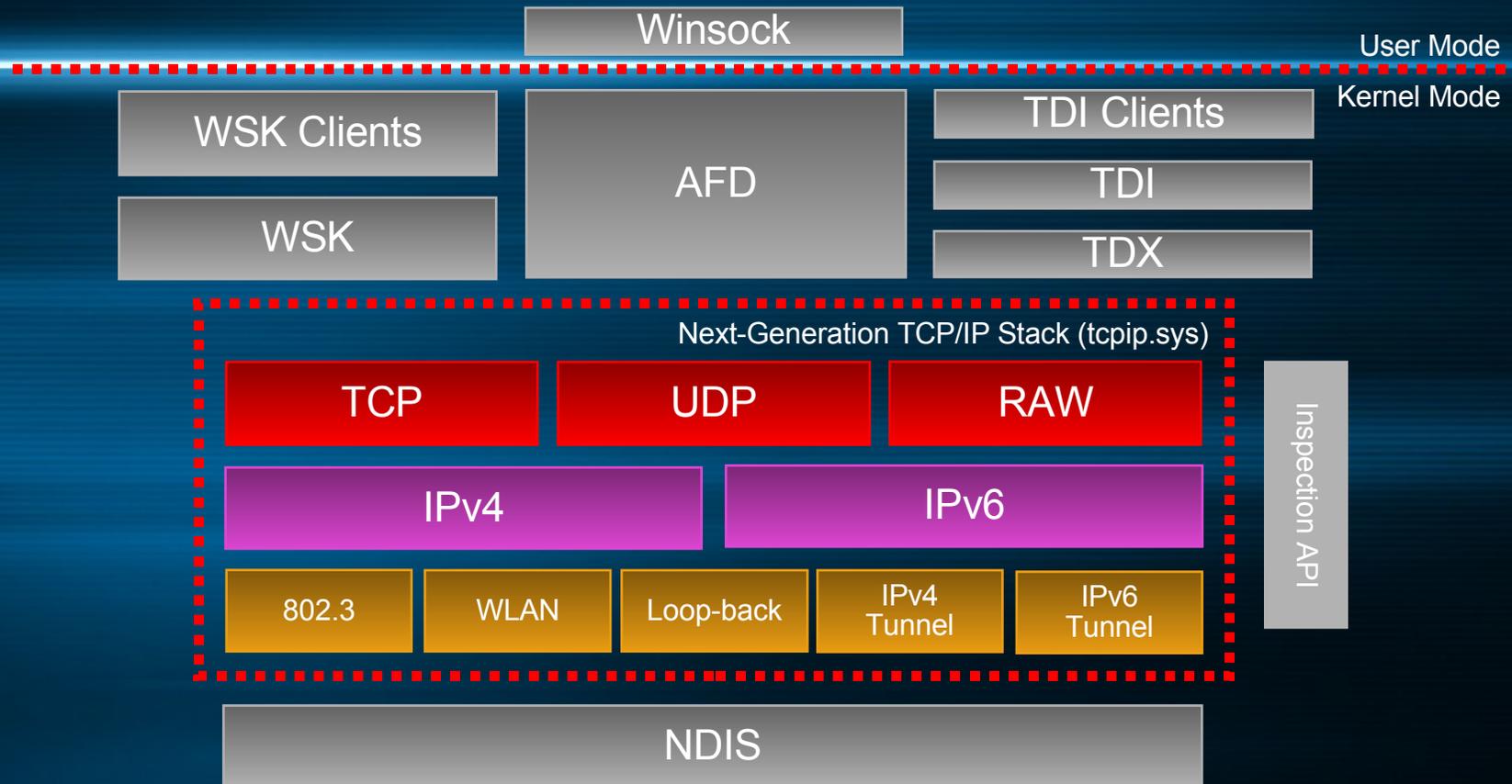IPv6 is supported in a production environment on the following Windows versions

- Windows XP (SP1/SP2)
- Windows Server 2003 family
- Windows CE 4.1 and newer (Windows Mobile 2003 and newer)
- Windows Vista (Next Generation TCP/IP stack)
  - Installed and enabled by default
- Windows Server „Longhorn" (currently beta3)
  - Installed and enabled by default

NEXT GENERATION NETWORKING

Complete Redesign of TCP/IP

Winsock

User Mode

Kernel Mode

WSK Clients

AFD

TDI Clients

WSK

TDI

TDX

Next-Generation TCP/IP Stack (tcpip.sys)

TCP	UDP	RAW

IPv4	IPv6

802.3	WLAN	Loop-back	IPv4 Tunnel	IPv6 Tunnel

Inspection API

NDIS

- Architecture for native IPv4, IPv6 and IPsec support
- New performance capabilities via hardware acceleration
- Network auto-tuning and optimization algorithms
- Greater extensibility and reliability through rich APIs

A Short List of New Features

Technologies	Security	Experience	Scalability
IPsec	X		
VPN Routing Compartments	X		
Windows Filtering Platform (WFP)	X	X	
Secure Sockets API	X		
IPv6			X
TCP Chimney			X
TCP-A (I/OAT)			X
Receive Side Scaling (RSS)			X
Receive Window Auto-Tuning		X	X
Compound-TCP (CTCP) – Congestion Control		X	X
Wireless Reliability		X	
Black-Hole Router Detection (BHRD)		X	
Dead Gateway Detection		X	
Network Diagnostics Framework/Extended TCP Statistics		X	
Policy-based Quality of Service (eQoS)		X	X

Even more details available in recent "The Cable Guy" Articles:
http://www.microsoft.com/technet/community/columns/cableguy/cgarch.mspx

Microsoft IPv6 Roadmap

2007+

- Windows Server "Longhorn"
  - Active Directory
  - Internet Information Server
  - Internet Authentication Server
  - Remote Access Server
  - Network Access Protection
  - File & Print
  - Terminal Server
  - Windows Media Server
- Exchange 2007 Server SP1
- Live Communication Server
- System Management System

Now

- Windows Vista Client
- Office 2007 System
- Sharepoint Server
- Windows Vista Media Center Edition
- Windows XP and Server 2003 developer platform ready
- SQL Server 2005
- Some Applications/OS Services with IPv6 support
  - Windows 2003 File & Print, IIS – IPv6 optional install, DNS
  - Windows 2003 ISATAP/6to4 and Port Proxy
  - Windows XP SP2 – IPv6 optional install, selective apps IE, Windows Media Player, MSN Messenger

SEAMLESS APPLICATIONS

The Connectivity Imperative

- Always on, Mobile users
- New Devices, PC form factors
- Data driven business and regulations

- Interoperability & Integration
- Secure, Reliable, Transacted Messaging
- Decoupled, Dynamic Applications

Seamless Applications

- Software combined with Services

- Unified experience across devices

- Distributed sharing, storage and access

- Rich client experience with mobility of web

- Virtual and remote hosted applications
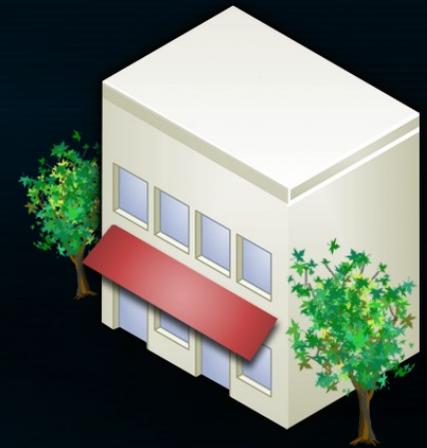
Seamless Applications Impact

The Future of Personal Computing
- From personal computer to personal computing
- Across multiple PCs and devices
- Blurring of digital workstyle and lifestyle
- Individual in control of their digital world

The Future of Business Computing
- Revitalization of IT
- Focus on business success
- Employee productivity and impact
- Customer experience

Seamless Application Platform

Microsoft® .net™

VB	C#	C++	J#	. . .

ASP.NET	SQL/Data	Compact Framework	COM/COM+

Microsoft® Visual Studio 2005

Windows Peer to Peer Fundamentals

Identity	Discovery	Communicate

Windows Communication Foundation

Web Services	Transaction	Messaging

Windows Vista™   Windows Server® Code Name "Longhorn"

Windows Peer to Peer Fundamentals

Server independence

- Eliminate bottlenecks
- Improve scalability, performance

Less expensive
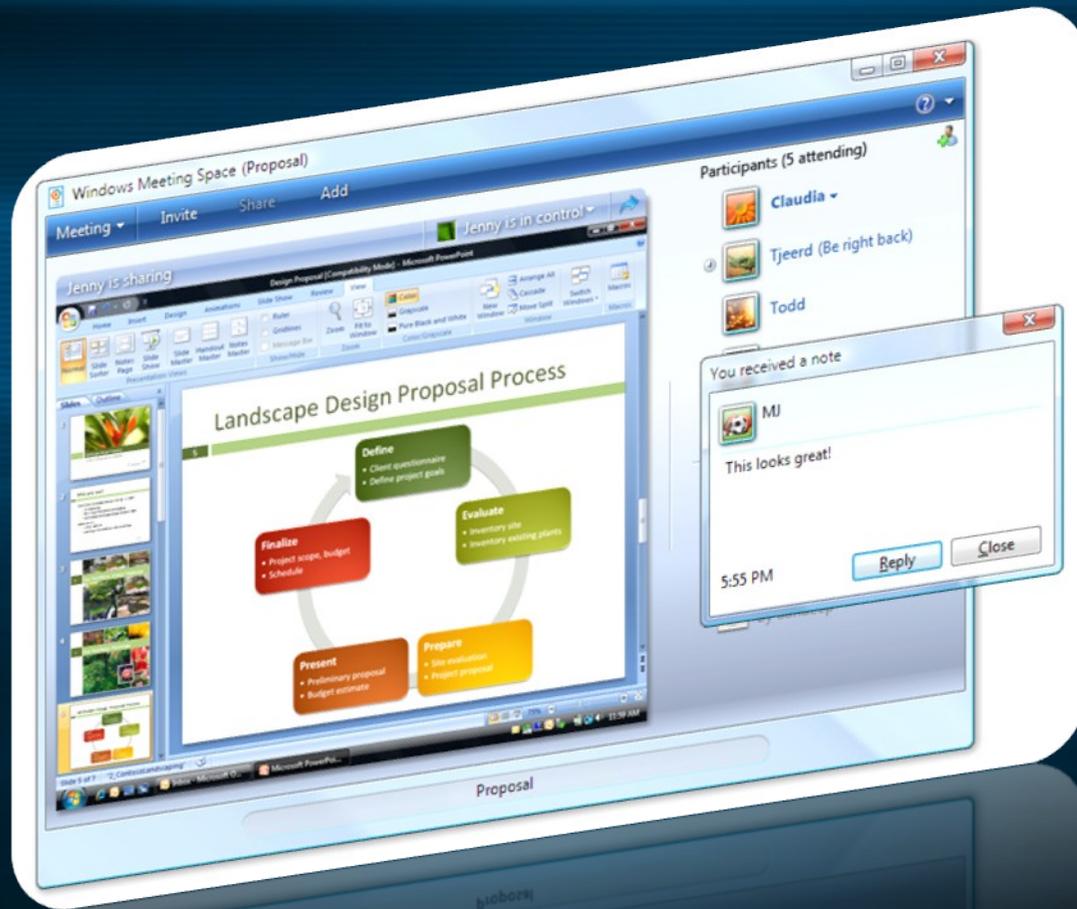
- Reduce deployment costs
- Reduce complexity

Better Experience

- Interact from the edge
- Ad-hoc and private networks

Windows Meeting Space

- Seamless meeting and collaboration experience

- Peer to peer discovery, identity and communication

- Instant connectivity and support for ad-hoc wireless

Networking Vision from Microsoft

"*Seamless Networking*"

- Internet <u>IS</u> the network
- Logically zoned
- Access controlled by identity and policy
- All communications authenticated and optional encrypted
- Traffic management at the edges and network attachment points

Untrusted Unhealthy PC

Trusted Enterprise

Isolated

Remediation Server

New Customer

Web Server

Infrastructure Servers

Trusted home

Malicious Users

Remote Access Gateway

Unmanaged Devices

Mobile Trusted Home PC

IPv6 Ready

'On by default' experience → Automatic deployment

Management and diagnostics → IT ready

Complete infrastructure → Support for IPv6-only

Firewall and IPsec support → End to end security

New experiences → Increased Productivity

IPv6 Adoption cycle

Consumer:
- Automatic with adoption of Windows Vista™ and new applications
- IPv6 home Internet gateway routers available this year

Enterprise:
- Application driven adoption
- Network transition solutions will be used first
- Full transition to dual IP version network on hardware refresh cycles

Service providers:
- Services available now
- End to end services as application adoption occurs

IPv6 Migration Phases

Infrastructure Phase

Transition network:

Automatic tunneling:

ISATAP, 6to4, Teredo

Dual stack

Enterprise work items:

Deploy network solution

Enable/deploy IPv6 DNS

Provide core services:

  Active Directory

  Web, File/Print etc.

  DHCPv6

Basic Security:

Deploy IPv6 to control connectivity

Limit/block IPv6 at edge FW

Application Phase

Migrate applications:

3rd party applications

Line of business applications

Enterprise work items:

Inventory & Assess Impact

Leverage MSDN tools *(checkv4.exe)*

Port applications

Test applications in IPv6 environments

Increase Security:

Deploy Host Firewall and protection solutions

Update/purchase new IDS/IPS solutions

Operational Phase

Operate environment:

Application and host management systems

Enterprise work Items:

Helpdesk training

Host monitoring

Systems management

Patch update

Best practices:

Monitor all traffic in/out

Deploy IPsec Isolation solutions

Infrastructure Phase Options

Deployment option	Solution(s)	*Cost	Availability
Automatic transition	Teredo, 6to4	$	Windows XP and Vista™ Microsoft Teredo service
Managed transition	ISATAP	$	Windows Server 2003 ISATAP Cisco IOS 12.x
Dual native IPv4, IPv6	Network update or upgrade	$$$	~All production routers
IPv6-only	Network upgrade plus Access to legacy IPv4 via Proxy	$$$$	Windows Server 2003 Port-proxy Cisco IOS 12.4 NAT-PT

*Relative cost; not based on study

Microsoft's IPv6 Internal Deployment

- ☐ ISATAP available in all buildings world-wide
- ◯ Native v6 connectivity in all development buildings world-wide
- ▷ Microsoft hosts public Teredo service

Microsoft IT Case Study

World's largest IPv6 enterprise network!
- 89,000+ users, 300,000+ potential machines

Goals
- Gain operational experience and provide customer deployment guidance
- Validate Windows Vista™ and Server "Longhorn"

Deployment Approach
- Deploy managed transition first
- Upgrade to native on hardware refresh cycle

Lessons
- Enterprises can provide low cost IPv6 deployment
- Operational phase missing products and tools

Partners in IPv6 Deployment

CISCO   Microsoft®

Enabling deployment of IPv6 today

We are helping customers explore innovative ways of doing business through next generation, standards-based IP networks

We're ready when you are.

Summary

➢ Microsoft believes in IPv6 and has a clear vision

➢ Microsoft is committed to building and enabling development of Seamless Applications

➢ Windows Vista™ and Windows Server code-name "Longhorn" will enable Seamless Applications and Networking

➢ Enterprises can adopt Seamless Applications and IPv6-based experiences using network transition solutions today