

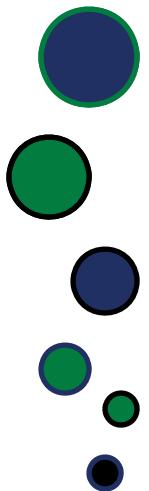
Real World IPv6 Enhanced Technologies

Yurie Rich

Native6, Inc.

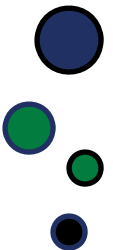
April 23, 2009

Rocky Mountain IPv6 Task Force Summit



Agenda

- The IPv6 Business case
- IPv6 Enhanced Technologies
 - Vidder
 - Microsoft's DirectAccess
 - NTT & Earthquake Warning Alert System
 - Nivis Street Light Monitoring
- Other examples
- Conclusions



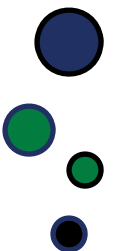
The IPv6 Business Case

- The “Killer App”?



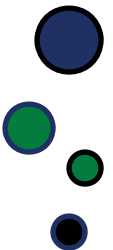
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- There is no universal business case for IPv6
 - What’s the business case for copper piping versus PVC?
 - Its not a “one size fits all” issue
- IPv6 is an enabler in numerous industries, serving as the basis for more cost effective and technologically sound solutions deployment



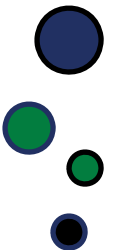
Real World IPv6 Enhanced Technologies

- Goal: Less crystal ball, more “get real”
- Structure:
 - Who makes it?
 - What is it?
 - What does it do?
 - How does it use IPv6
 - Why not use IPv4



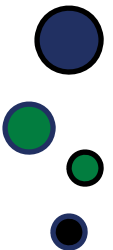
Special Thanks first

- People who helped or provided information for this presentation:
 - Junaid Islam, Vidder, Inc.
 - William Dixon, v6Security, Inc.
 - Cody Christman, NTT
 - Geoff Mulligan, Proto6



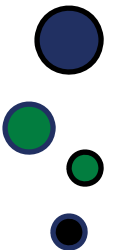
Vidder Streaming Application

- Who makes it?
 - Vidder
- What is it?
 - Real-time video streaming application
- How does it work?
 - Video source acts like a server, streaming content to authorized viewers in real-time.
 - Supports mobile video sources as well as viewers using Mobile IP



Vidder Streaming Application

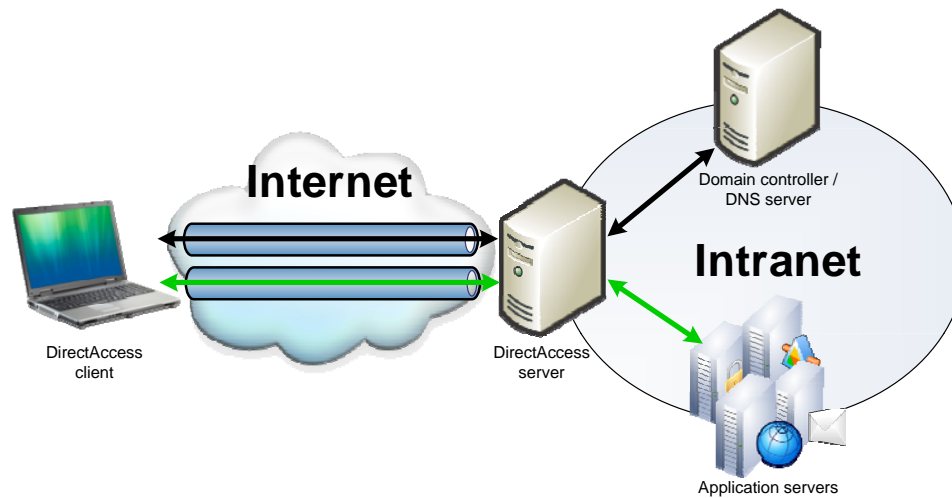
- Why IPv6?
 - Availability of end-to-end streaming (so less middleware)
 - Opportunities to use MIPv6 for solutions where both video sources and viewers may be mobile
 - Utilizes IPv6 multicast to support multiple viewers
 - Interoperability with legacy environments
- Why not with IPv4?
 - Do video with 90% less hardware in IPv6 – not same option in IPv4
 - Mobile IPv4 not robust enough to support the Vidder architecture



DirectAccess

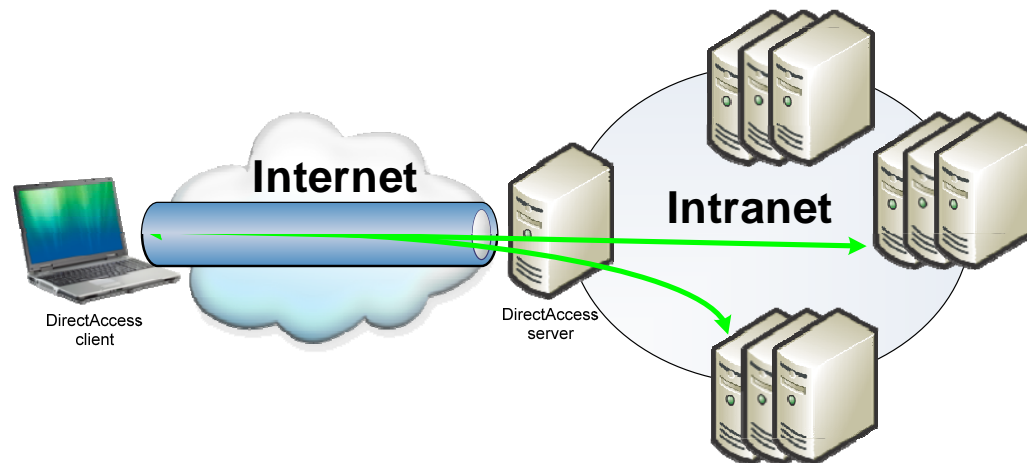
- Who makes it?
 - Microsoft
- What is it?
 - Service integrated into the Windows 7 and Server 2008 R2 releases that provides:
 - » Bi-directional Remote Access
 - » Designed to be a faster, less cumbersome alternative to VPN
 - » Provisions for device and user to connect to the “home” network
 - » Part of a greater architecture to improve remote access, organizational device management, and health maintenance

DirectAccess (DA)



DA client connects to DA server via IPv6 IPsec tunnels, even over IPv4-only networks

DirectAccess can be configured to provision IPsec end-to-end with internal resources, or end-to-edge.



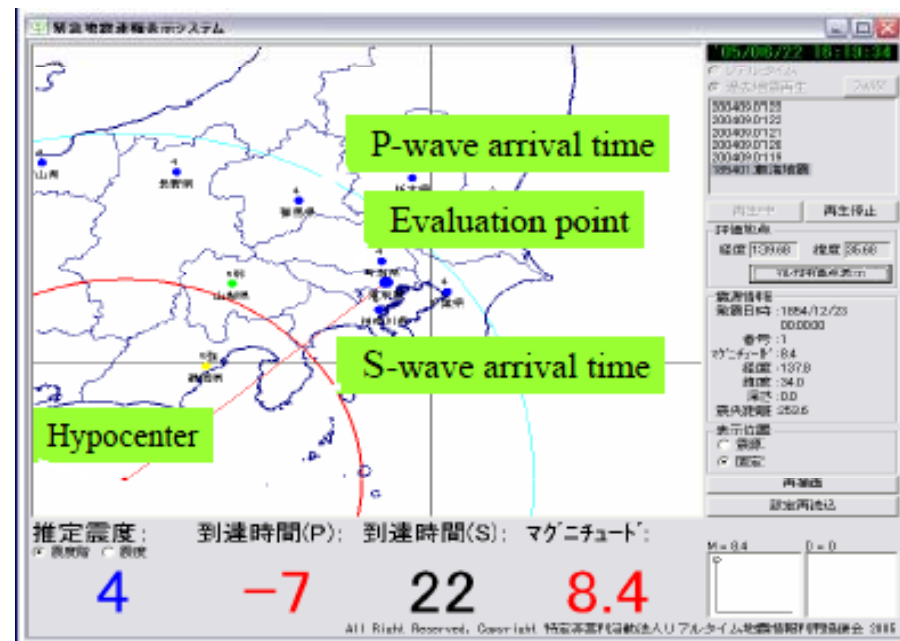
Source: Microsoft's "Technical Overview of DirectAccess in Windows 7 and Windows Server 2008 R2", January 2009

DirectAccess (DA)

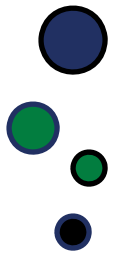
- Why IPv6?
 - DirectAccess clients want globally routable addresses
 - » Avoids RFC1918 overlaps
 - For enhanced security, DA leverages IPsec, inherently supported by IPv6
 - Take advantage of IPv6 transition mechanisms that do NAT traversal well (i.e. Teredo) or IP-HTTPS
- Why not IPv4?
 - NAT overlap
 - Not future proof
 - Cleaner architecture in IPv6 (supposed to make things easier – not more complicated!)

Earthquake Early Warning System

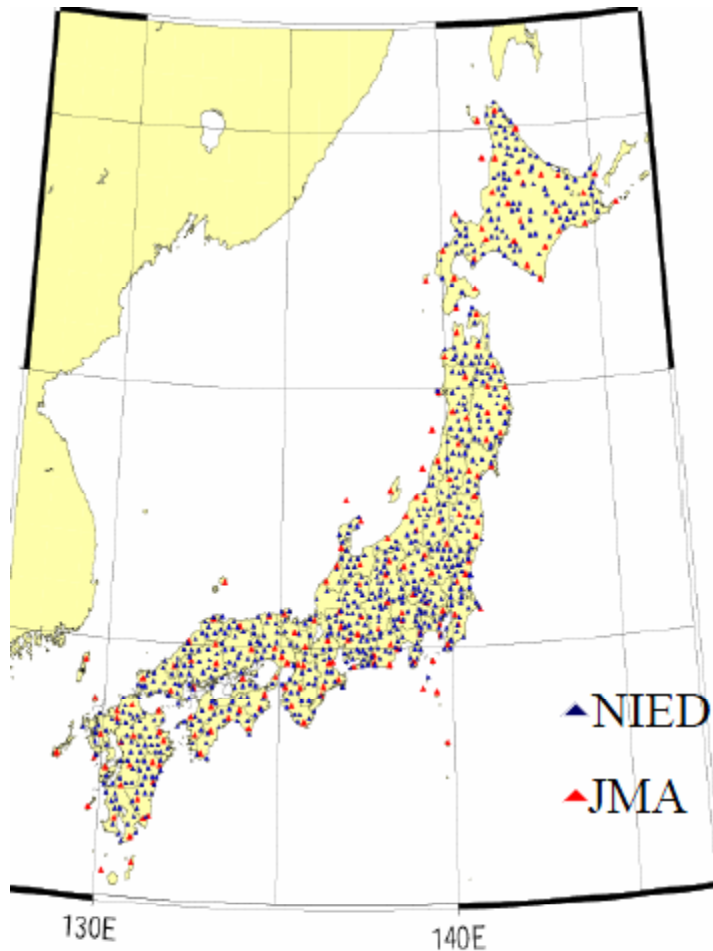
- Whose it from?
 - Japan Meteorological Agency (JMA) & NTT Communications
- What is it?
 - Warning system that notifies participants of an earthquake occurrence
 - » Epicenter
 - » Magnitude
 - » Estimated arrival at participant's location



Source: Yoshinori Rokugo, presentation at REIC in Sept. 2007

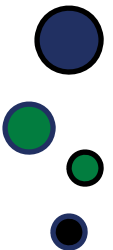


Earthquake Early Warning System



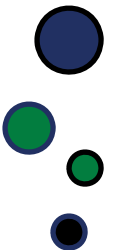
- JMA concentrates data from ~1000 sensors.
- Data is processed and analyzed in real-time
- Distributed to various destination through various means, including NTT IPv6 multicast network

Source: Yoshinori Rokugo, presentation at REIC in Sept. 2007



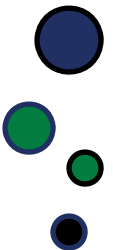
Earthquake Early Warning System

- Why IPv6?
 - Distribution of data to service participants is done over IPv6 multicast network for simultaneous distribution
- Why not IPv4?
 - IPv4 multicast space is just not large enough to support global multicast distribution
 - Long term, sensor system can work with 6lowpan and other v6 based technologies to more readily integrate into future networks

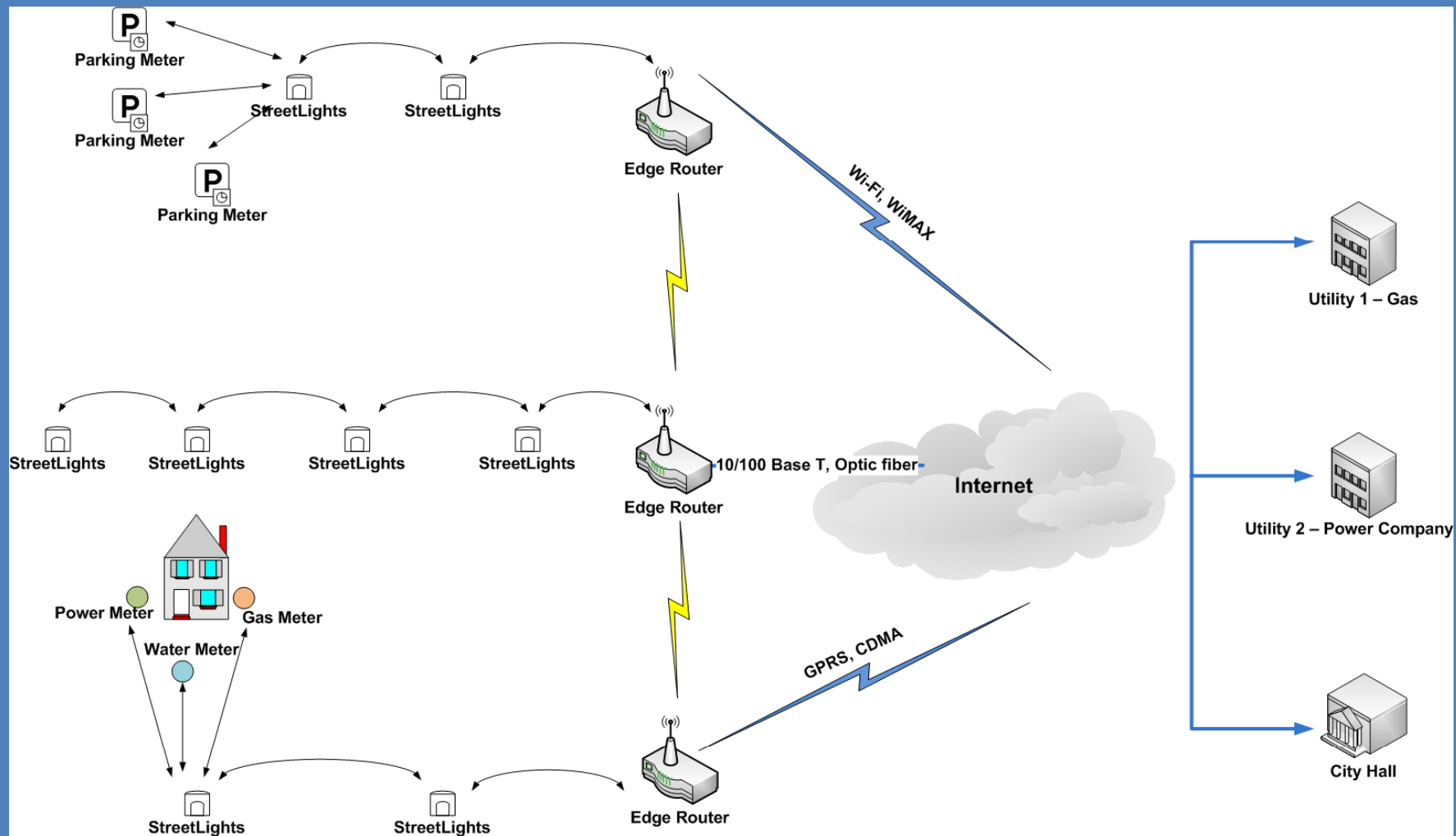


Smart Street Light Solution

- Who makes it?
 - Nivis
- What is it?
 - Energy management solutions for street lights
 - Does double duty carrying other municipality services traffic
- How does it work?
 - 6LowPan meshed network
 - Sensors provide individual light management
 - » Significant cost savings associated with dimming control



Smart Street Light Solution



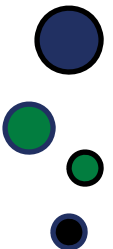
Source: Geoff Mulligan, Google IPv6 Implementers Conference

Smart Street Light Solution

- Why IPv6?
 - Scalability: Requires large volume of addresses
 - Autoconfiguration – reduced infrastructure requirements
 - 6LowPan is an “open” global standard – nonproprietary with smaller code footprint
- Why not in IPv4?
 - Not scalable
 - NAT is problematic
 - No comparable autoconfiguration feature in IPv4

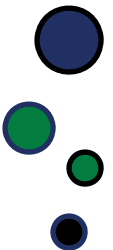
See more information at:

<https://sites.google.com/site/ipv6implementors/conference2009/agenda>



Additional IPv6 Solutions

- Hikari TV (IPTV over IPv6 multicast) – NTT
- Meeting Space (Collaboration) – Microsoft
- IPv6 VoIP – Freebit & Asterisk
- Security & Monitoring network using IPv6, 2008 Olympics – BII in China
- IPv6 BACnet for building energy control – Japanese consortium of private companies, universities, and government
 - Used in 2008 Olympics as well as in Tokyo in several major buildings and at the Univ. of Tokyo
- etc.....

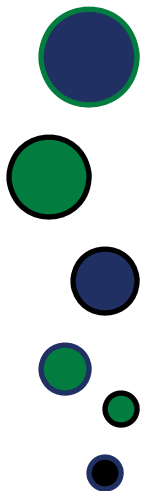




So What?

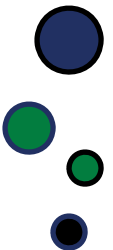
"I never stream video, nor live in an earthquake zone. I'm a die hard Linux user and they don't have street lights where I live. What now tough guy?"

2009 RMv6TF IPv6 Conference



So What?

- To borrow a phrase
 - “Don’t be in denial”
- A move to IPv6 is inevitable
- Being prepared is better than being surprised
- High probability that some technology that is in the works that will be advantageous to your organization
- Will you be ready?



The Path

- Get educated
 - What don't you know?
- Start planning
 - Technical and business planning should occur hand-in-hand
- Encourage your vendors
 - "I'll build it when they ask for it" - So ask for it!
- Integrate smartly
 - Reasonable time frame, reasonable costs. Procrastination means expensive
- Generate ROI on day 1
 - It has to save you money, make you money, or give you a competitive advantage

Native6 Services

- IPv6 Training
 - Executive level education
 - IPv6 Best Practice thought leadership
 - Hands-on instructor-led training for
 - » Network and Systems Integration
 - » Network and Systems Security
 - » Application porting and development
- IPv6 Integration Services
 - Full service shop providing expertise in planning (technical and business), and integration assistance
 - Native6 partnerships ensure that we provide the most experienced and rounded IPv6 integration team possible!

Thank you very much!

Yurie Rich
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Training, Planning, Integration, IPv6 ROI

