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”?  

  WHOA WHOA! I JUST GOT AN IDEA THAT COULD CHANGE EVERYTHING…  

  WHAT IF WE LOWERED EXPENSES AND INCREASED REVENUES? THAT COULD HELP OUR FINANCIAL SITUATION.  

  AAAGH! I CAN’T SEE!!  

  SOUNDS LIKE A BLINDING FLASH OF THE OBVIOUS, SIR.  

©1993-2009 Scott Adams, Inc.

• There is no universal business case for IPv6  
  – What’s the business case for copper piping versus PVC?  
  – It’s 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.
  – 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.

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........
“I never stream video, nor live in an earthquake zone. I’m a die hard Linux user and they don’t have street lights were I live. What now tough guy?”
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
yrich@native6.com
www.native6.com

Training, Planning, Integration, IPv6 ROI