

# **NIST Activities on IPv6**

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# Draft USGIPv6 – v 1.0

- **Public Review:** February 1, 2007.
- **Closed:** March 2, 2007.
- 400+ Public Comments received
- 33 Individuals and Organizations commented.
- Comments received include Policy as well as Technical concerns.

# Outline of the Talk

- (1) A Walk Through the Profile.
- (2) Differences from other Profiles (IETF, DoD, IPv6ready).
- (3) Major Comments Received.
- (4) Other Procedural Consequences.
- (5) Testing Arrangements.
- (6) Harmonization?

# Walkthrough: Purpose and Scope

- **NIST SP 500-267**
  - Recommended acquisition profile from NIST for agencies seeking operational deployment of IPv6 technologies.
    - **Policy Free** – other USG and Agency specific policies may use this as a basis for further definition.
    - **Minimal Interoperability IPv6 subset for common devices and expected services.**
      - Defining the low bar to provide expected functionality, achieve interoperability, insure security and protect potentially significant resource investments.
      - In some areas our low bar is higher than current industry norms.
      - Not trying to specify everything that might be in a box; instead, what we think must be in a box.
    - **Expected that Agencies will add additional requirements as needed.**
      - Things missing from our profile are by definition “optional” and may be added by agencies/programs as needed.
    - **Focus on IPv6 Data Plane**
      - Get to viable IPv6 data plane first, then go for IPv6 only devices.
    - **Defines USGIPv6-v1.0 compliant Hosts and Routers.**
      - Expected to put a testing program in place to verify compliance to the profile.

# Walkthrough: Goals and Objectives

- **Support OMB/GSA policies.**
  - **Provide a basis** through which OMB and GSA can further refine either emerging acquisition and deployment policies.
    - Avoid policy confusion – allow policy sources to define “USG IPv6 Capable” and FAR in terms of (our) profile.
    - Fill in the technical pieces necessary to support these policies and their time frames.
      - E.g. provide interim specification of Network Protection Devices (firewalls and IDS systems) vital to ensure the security of Federal IT systems under OMB deployment strategy.
- **Leverage DoD/IETF/Industry efforts.**
  - DISR, IETF Node requirements, IPv6Ready, NSA, ICISA profiles and testing programs carefully analyzed.
    - Considered existing content capabilities, governance and timing issues.
  - USGv6V1.0 is a synthesis/intersection of these efforts mixed with USG specific requirements.
  - Long term goal is to get to the point where a distinct USG profile/testing program is unnecessary.

# Walkthrough: Profile Overview

- **Scope and Application**
  - **Strategic planning document** to guide acquisition of IPv6 technologies for large scale, operational deployments.
  - Defines minimal *low bar* of capabilities to:
    - Insure Interoperability.
    - Enable secure operation.
    - Protect early investments.
  - **Basis for further refinement and definition.**
    - Agency/mission specific technical requirements.
    - Acquisition/deployment policies.
- **USGIPv6-V1 Compliant**
  - Provides technical basis for product testing and certification program.

# Walkthrough: Profile Categorization

- **Sub profiles for 3 types of device.**
  - Host Profile.
  - Router Profile.
  - Network Protection Device Profile.
- **12 Functional Categories of Capabilities.**
  - 6.1 Base
  - 6.2 Routing
  - 6.3 Quality of Service
  - 6.4 Transition
  - 6.5 Link Technology
  - 6.6 Addressing
  - 6.7 IPsec
  - 6.8 Application Environment
  - 6.9 Network Management
  - 6.10 Multicasting
  - 6.11 Mobility
  - 6.12 Network Protection Devices
    - Sources of Requirements.
    - Common requirements for NPDs.
    - Firewall requirements.
    - Intrusion detection and prevention system requirements.

# Walkthrough:The Spreadsheet

- *See pages 30-40 of the profile.*



# Differences from other Profiles

| <b>Profile</b> | <b>Dev</b> | <b>FC</b> | <b>Rev</b> | <b>IPsec<br/>2401</b> | <b>IPsec<br/>4301</b> | <b>AH</b> |
|----------------|------------|-----------|------------|-----------------------|-----------------------|-----------|
| <b>IETF</b>    | 2          | No        | No         | obs                   | refer                 | agno      |
| <b>DISR</b>    | 6          | Yes       | Part       | M                     | M                     | Yes       |
| <b>V6Ready</b> | 2          | No        | Yes        | -                     | -                     | No        |
| <b>USG</b>     | 3          | Yes       | Part       | M                     | S+                    | No        |

# Major Comments Received

- Policy
- Security
- Product Classes
- Network Protection
- Routing Protocols
- Calls for Harmonization
- Applications
- Crypto Generated Addresses
- IPv4-IPv6 Translation

# Comments: Policy

- **From Agencies and from Industry:**
  - What is the Profile's applicability, i.e. what 'Must' agencies do or not do and when?
  - Does NIST have any plans to produce a 'Classified' Profile?

# Comments: Security

- Mandate AH (or not).
- Mandate RFC 4301 and deprecate 2401 (or not).

# Comments: Product Classes

- **Use DoD DISRs 6 product categories.**
  - Do not mandate ‘full’ IPv6 compliance for certain devices, such as IP phones.
- **Or, Current 3 categories are okay.**
- **Split the Router category into finer gradations.**

# Comments: Network Protection

- **Publish this as a separate Specification.**
  - It “doesn’t belong” in an IPv6 profile.
- **Advance** it to an **RFC** in the *IETF*.
- **Beef up** the **MUST/MAY** language to **RFC 2115**.

# Comments: Routing Protocols

- **More flexibility required for Interior Gateways:**
  - Do not require only OSPF.
  - Optionally allow one of OSPF, RIP, IS-IS, or others.
  - Allow BGP as an optional Interior Routing protocol.

# **Comments: Calls for Harmonization**

- Harmonize with the DoD DISR profile.



# Comments: Applications

- Calls to add a **DNS** specification.
- Calls to add **Applications**.

# Comments: Crypto-Generated Addresses

- Crypto Generated Addresses.
- Or, Do not require Crypto Generated addresses because there is IPR restricting their use.

# Comments: v4-v6 Translation

- Calls to include IPv4-IPv6 Translation as a transition method.

# Other Procedural Consequences

- **OMB/GSA** are in the throes of hatching a **FAR** clause that will depend on the NIST profile and Testing recommendations.
- Calls for *Industry interaction* may lead to a government organized 'Industry Day'.
- There is need for policy to include *Revision Management* beyond a June 2008 'Red Flag' day.

# Testing Arrangements

- **Existing Analysis**

- DoD JITC
- IOL/IPv6 ready
- ICOSA
- Commercial Tool Industry

- **What We Need**

- Interoperability
- Conformance
- Approved Products List

- **Steps**

- Public Meeting.
- NIST recommendations to OMB.
- Establishment of a Testing program and APL.

# Harmonization

- **Initial DOD Profile WG group reaction:** “*there is very substantial overlap*”.
- **IPv6Ready reaction** is *positive*.
- But **USG** now makes it 3.
- **De facto compliance** Today is to DOD or IPv6Ready.
- **USG compliance** not likely before 2Q/3Q 2008.
- **Harmonization efforts** with IPv6Ready and DoD after this Rev. should lead to 2 or 1 remaining profile.
  - (Optimistically) harmonized profile applicability by 18m – 2yrs after USG applicability.
- **Is there a need** for Incremental profiles involving IPv6 Applications?