Defense Research and Engineering Network IPv6 Pilot Introduction

– 2003 to 2008 –

IPv6-team

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Topics

- World history of IPv6
- DoD and NATO history of IPv6
- DoD actions to get ready for IPv6
- US Government actions to get ready for IPv6
- Why DoD and US aren't ready

Introduction

- In 2003, the DoD CIO said the DoD was going to transition to IPv6 by June, 2008
  - DREN became the first DoD IPv6 pilot network
- In 2005, OMB said all federal Agencies would transition to IPv6 by June, 2008
- A lot has happened in 5 years…

World History of IPv6

- 1990 – early published prediction IP address space will run out "soon"
- 1992 – Internet Architecture Board (U.S. based) suggests moving Internet to International Standards Organization (European) protocols – rejected
- 1994 – various Internet standards committees approve Internet Protocol for the next generation (IPng also known as IPv6)
- 1996 – Academic, industrial, and research organizations deploy dual stack IPv4/IPv6 backbones
- 1999 – Academic, industrial, and research organizations begin deploying native IPv6 backbones
- 2001 – Japan and Pacific Rim nations begin deploying native IPv6 production backbones

DoD and NATO History of IPv6

- 1995 – Navy NRL-DC develops IPv6+IPsec implementation for Advanced Technology Demo of data/voice integration
- 1998 – NATO recommends adoption of IPv6 rather than similar ISO protocol suite
- 1999 – NATO proposes multi-national interoperable network for secure communication (INSC) test bed
- 2000 – Navy SSC-Charleston deploys DEFENSENET IPv6 test bed (later merged into DISN-LES)
- 2001 – NATO deploys INSC test bed
  - DoD HPCMP deploys DRENv6 test bed at 7 sites
- 2003 – June 9, ASD NII/DoD CIO issues IPv6 transition memorandum – target completion FY2008
- 2003 – July 3, DREN identified as DoD IPv6 pilot for FY2004
- 2003 – 2004 DISA and each Service establishes an IPv6 Transition Office to plan future IPv6 transitions
- 2004 – Ministry of Defence, UK, establishes IPv6 policy

DoD actions to get ready for IPv6

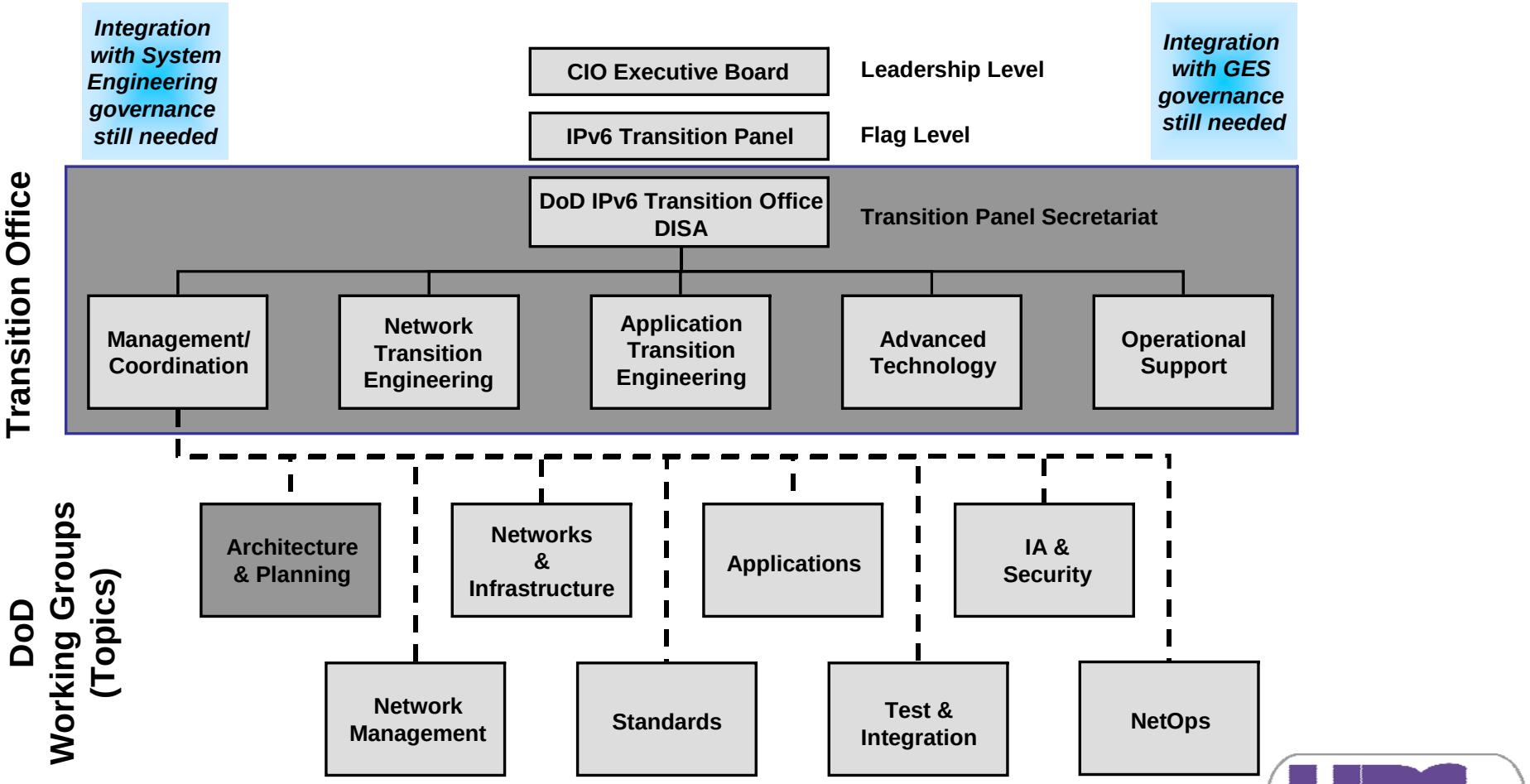
- When looking at the enormous effort needed:
  - Play the Waiting Game: Don't Do Anything and Wait for Others to Provide Details, useful Information
- OR
  - Overplan: So that you never get to the actual work
- OR
  - Take the Easy Way Out: Work on what you know. For example, worry about applications and devices later
- OR
  - Press the "I Believe" button: Jump in to the transition and quickly find out what works (and what doesn't)

DoD actions to get ready for IPv6

- DoD and each service have established an IPv6 transition planning organization and have a Transition Plan
  - DoD tasked DISA to establish the DoD IPv6 Transition Office (DITO)
  - The Army established an IPv6 Transition Plan Working Group (ITPWG)
  - The Navy established a Navy IPv6 Transition Project Office (NITPO)
  - The Air Force established an IPv6 Transition Management Office (TMO)
  - The Marine Corps established an IPv6 Transition Working Group (IPv6TWG)

DoD actions to get ready for IPv6

- **The DITO organization looked like this in 2004:**



DoD actions to get ready for IPv6

- The DoD Working Groups have produced useful documents:
  - The T&E WG has engaged various Service T&E organizations to do IPv6 testing, and published annual reports to congress on the results
  - The IA WG published guidance on how to protect classified enclaves running IPv6
  - The Network Integration WG has published a DoD IPv6 Address Plan
  - The Standards WG has published several versions of a DoD IPv6 Profile standards document
- DITO has established a portal on the DKO web site
  - https://www.us.army.mil/suite/page/474695

DoD actions to get ready for IPv6

- The DISA NIPRNet conducted a formal IPv6 Compliance test in June 2008, but hasn't transitioned
- Wait for Others to Provide Details, useful Information
  - The Joint Interoperability Test Command has established a test process to validate vendors IPv6 capability and publishes results at jitc.fhu.disa.mil/apl/
  - The Intelligence Community performed extensive analysis of IPv6 standards for possible security vulnerabilities
  - DREN established a knowledge base of IPv6 lessons learned
    - https://kb.v6.dren.net (CAC accessible)
- So a lot has happened in 5 years…

US Govt actions to get ready for IPv6

- OMB established the Federal IPv6 Transition Working Group and published IPv6 Transition Guidance for the Agencies in 2006
- Each Federal Agency has its own designated lead to coordinate IPv6 planning and its Transition Plan
- The National Institute for Standards and Technology (NIST) published a USG IPv6 Profile standards document in 2008
- Each Federal Agency conducted a formal IPv6 Compliance test by the end of June 2008
- So a lot has happened in 5 years…

Why DoD & US aren't ready

- There is extremely low customer demand for IPv6 products
- Consequently, there is no money in it for the manufacturers
  - So other products and features take precedence
- Implementing basic IPv6 capabilities takes precedence over advanced features
  - Manufacturers just want to check the "IPv6 capable" box to sell products
- Lack of advanced IPv6 functionality discourages deployment
  - IPv6 isn't any better than IPv4, so why use it?
  - Lack of security components hinders ability to deploy it in some environments
- If nobody else is deploying it, then there's nothing you are missing by not having it
- Lack of incentives to deploy results in lack of customer demand
- So, loop back to top and repeat *ad naseum*