

**IPv6 Features
[and lack thereof] in
current network hardware
...or, what you should tell your
vendors you want.**



Nick Buraglio | Network Engineer CITES / NCSA / ICCN
University of Illinois at Urbana-Champaign



Why compile a list?

- Many network environments are thinking about, or in the process of deploying IPv6.
- There are many facets to this, many of which are easy to overlook.
- Feature sets of network devices are often a limiting factor.
- No vendor agnostic list (that we could find) that had what we were looking for.
- We needed one.



The state of deployment

- Many R&E customers are still planning and upgrading equipment.
- Consumer networks in US are arguably behind in native IPv6 transport.
- Driving force to update not at critical point yet; many will wait until they absolutely have to.
- Cost to update to supported hardware / software sometimes prohibitive.
- A good reference would be nice for what is actually necessary / desirable / highly desirable.



None of this is really news

- Same problems as always.
 - No money
 - Cost prohibitive
 - Security FUD
 - Excuse of the day.



Learning is fun!

KNOWLEDGE IS POWER

IPv6 Features [and lack thereof] in current network hardware



Background

- On UIUC campus, we needed a strategy.
- Backbone had been plumbed with v6, NCSA had some pockets of v6, RON had v6...
- No users = nonexistent.
- Edge had no v6.
- Deployment strategy? Match IPv4 deployment?
- Hardware hurdles led to much research and much disappointment.



The feature matrix was born

- For my own knowledge (and because I'm unorganized), I attempted to create a feature matrix.
- Once the process started, we were very disheartened at the lack of feature parity.
- Large gaps in the matrix.
- Vendors contacts either don't have the info or don't want to share it (or we're not asking the right questions to the appropriate folks).
- Much interest by community, details trickle in.



The feature matrix was born.

- Grew into a much larger "project" than I anticipated.
- Security product matrix.
- Layer2 feature matrix.
- Layer3 feature matrix.
- ** Please contribute knowledge, experiences



The feature matrix was born.

- Lack of full support is a systemic issue that is potentially delaying the deployment of IPv6.
- The purpose of the documents is multi-faceted.
 - Get the information all in once place.
 - Create visibility into the holes that exist.
 - "Encourage" vendors to fill the gaps.
 - Provide knowledge and therefore leverage to encourage deployment.



Feature gaps

- The largest gaps seemed to be in the security products.
- Edge devices had decent but spotty support.
 - No RA-Guard
 - Pieces missing from v6 support
 - RADIUS
 - Syslog



Feature gaps

- Routing generally ok, some vendors had significant gaps in things expected to work.
 - mBGP not fully supported, features missing from IS-IS.
 - Not all protocols and features supported in VRF / Routing Instances.



What is needed?

- In addition to all of the normal IPv4 features, IPv6 features with matching functionality.
 - RA-Guard or equivalent.
 - MLD snooping
 - DHCPv6 Snooping
 - DHCPv6 Relay
 - Features available in all routing instances / VRFs
 - Features available in logical systems
 - Management via IPv6
 - Radius over IPv6
 - Syslog over IPv6



What is needed?

- And.....
 - IPv6 ACLs
 - Firewall Rules
 - Flow data export (both flows and transport)
 - IDP / IPS / DPI
 - SNMP OIDs for all v6 attributes equivalent to relevant v4 implementations (or better).



Feature gaps

- In an ideal world, the ability should be there to completely disable IPv4 and everything should work as it did with your IPv4 net (given destination content).



Where are the documents?

- <http://bit.ly/network-hardware-v6-feature-matrix>
- <http://bit.ly/ipv6-security-matrix>
- <http://people.ucsc.edu/~warner/switch-features.html>
(via Jim Warner @ucsc.edu)



How can you help?

- Tell your vendors that you need this stuff!
- Deploy IPv6!!
- Test the features of existing gear!
- Send updates to be added to the documentation!
 - Security device list needs more!
- Add exclamation points to every sentence on this slide!!

