FNAL & US-CMS IPv6 Update

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HEPix IPv6 WG Meeting

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FNAL IPv6 General Status

- Scientific computing systems are all dual-stacked:
  - CMS Tier-1 storage & worker nodes have been for ~3 years
  - Public dCache/FermiGRID nodes (DUNE, etc) for ~2 years
    - Reminder: OMB IPv6 mandate for scientific instrument systems is just dual-stack per OMB timelines, with IPv6-only as external collaboration allows

- Non-scientific computing systems to dual stack is proceeding more slowly...

- IPv4/IPv6 translation service in place for ~2 years
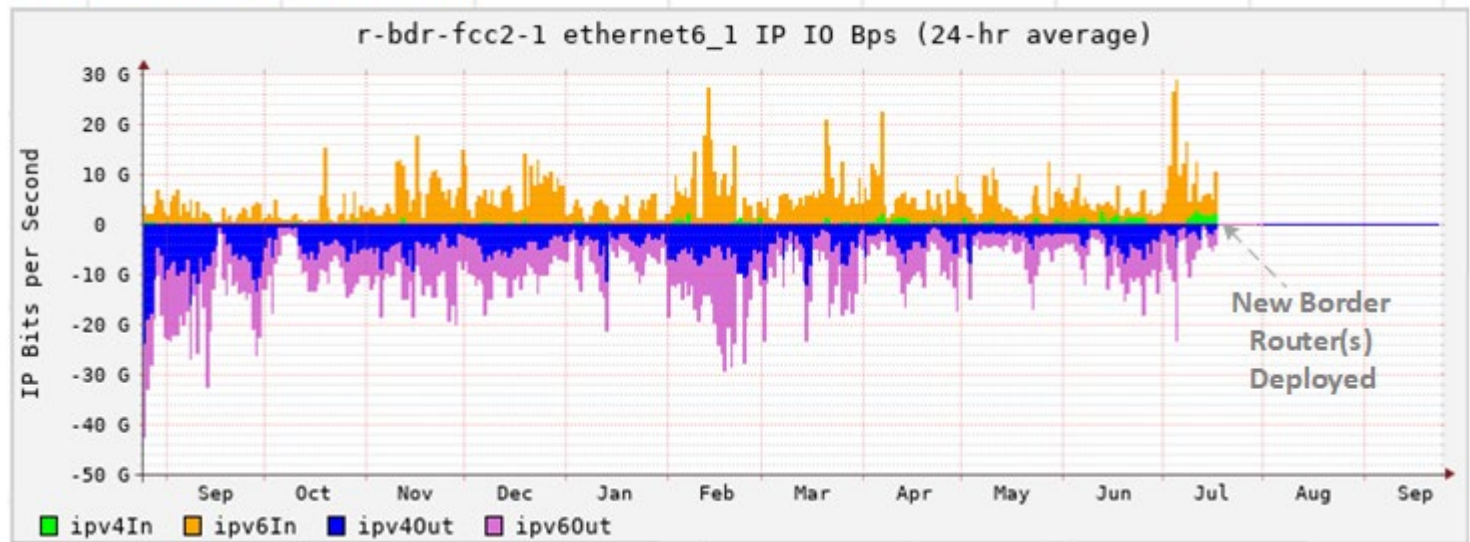 - But just used for tests & evaluations so far...

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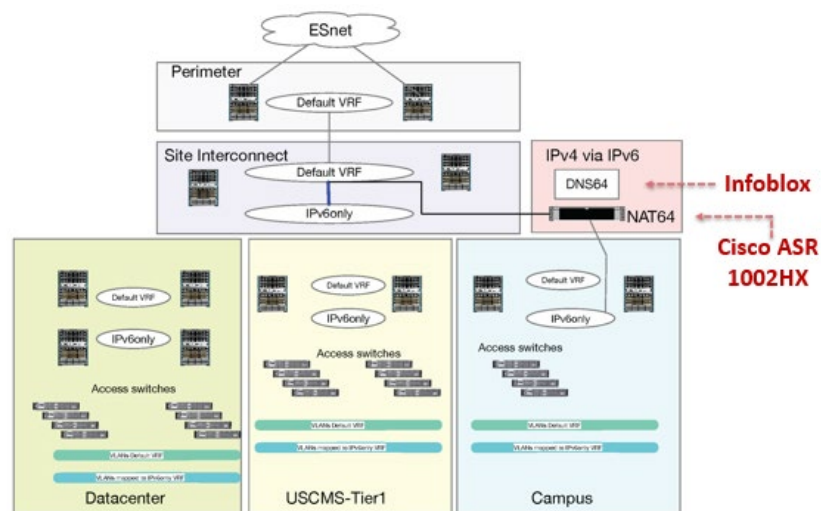
FNAL IPv6 Traffic Trends

- Not much change in % IPv6 usage over the past year...

	Inbound Traffic			Outbound Traffic		
	2022	2023	2024	2022	2023	2024
Science Networks (*)	77%	95%	89%	44%	65%	59%
General R&E Path	18%	33%	31%	33%	44%	48%

(*) LHCONE/LHCOPN/Pt-to-Pt Circuits

Science networks path

`Yearly' Graph (24 Hour Average)

r-bdr-fcc2-1 ethernet6_1 IP IO Bps (24-hr average)

New Border Router(s) Deployed

■ ipv4In ■ ipv6In ■ ipv4Out ■ ipv6Out

US-CMS IPv6 Status

- Progress here, US-CMS T2 storage is all dual-stack:

  – Worker nodes are mostly dual-stack:

US-CMS Site	Storage Nodes	Compute Nodes
FNAL (T1)	Dual-Stack	Dual-Stack
Caltech (T2)	Dual-Stack	Dual-Stack
Florida (T2)	Dual-Stack	Dual-Stack
MIT (T2)	Dual-Stack	Partially Dual-Stack
Nebraska (T2)	Dual-Stack	Dual-Stack
Purdue (T2)	Dual-Stack	Partially Dual-Stack
UCSD (T2)	Dual-Stack	Partially Dual-Stack
Wisconsin (T2)	Dual-Stack	Dual-Stack
Vanderbilt (HI-US-T1)	Dual-Stack	IPv4 Only
SPRACE (Brazil T2)	Dual-Stack	IPv4 Only
UERJ (Brazil T2)	Dual-Stack	Dual-Stack

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