Open Science Grid

OSG IPv6 Compatibility Preparations

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Open Science Grid – Operations Area Coordinator

- Two Main Area concerned with IPv6 Compatibility
  - OSG Operations – All infrastructure services operated by OSG Operations
  - OSG Technology – Middleware Components Shipped by the OSG Software Team

Operations Definition

- Goal of every operations service dual-stacked
  - Listening on both IPv4 and IPv6 address
  - No break in IPv4 service during testing and upgrade
  - The system's routing table should be able to direct packets appropriately and the DNS resolver routines should be able to properly look up both IPv4 and IPv6 addresses

Operations Preparations

- IPv6 Block Allocation – Completed
  - Requested and received from DNS Adimistration
- Firewall – Completed
  - The servers at the OSG Operations Center each run their own individual Netfilter firewalls, part of the Linux kernel, so it was a matter of setting up IPv6 firewalls similar to the existing IPv4 ones.
- Network Infrastructure Test – Completed
  - Configuring machines with their new IPv6 VLAN addresses, we were able to communicate from one to the other using ping6 and ssh. The switching infrastructure therefore seems to be IPv6-ready.

Operations Preparations (Cont.)

- IPv6 Address Allocation – Completed
  - This has been done for all hosts at OSG Operations
  - Future hostnames will be assigned both IPv4 and IPv6 addresses.
- Limited Testing – In Progress
  - We will enable IPv6 over the public network for certain test virtual machines whose failure, if it were to happen, would not affect any crucial services, or ideally, any services at all.
- ITB Testing – In Progress
  - On service-by-service basis.

Operations Preparations (Cont.)

- Underlying Code Updates – Ongoing
  - Network setup scripts
  - Service configuration scripts
  - HA services
- Production Deployment
  - As testing completes
  - Must maintain production quality of ops services
- Final Status
  - All service dual-stacked

Slight Difference for Software Definition

- The same as Operations with the following caveats
- Two Environments
  - A - Server is dual-stack, and client is dual-stack
  - B - Server is dual-stack, and client is IPv4 only
- Three question to be answered
  - If client and server are mixed-mode, does the software still function? (Environment "A" above)
  - If client and server are mixed-mode, does the communication happen over IPv6? (Environment "A" above)
  - If the client is IPv4-only and the server is mixed-mode, does the software still function? (Environment "B" above)
- IPv6 Only client and servers will not be tested in this round

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The Statuses

- **Yes**: We at OSG Operations have tested this service and found it to be IPv6-compatible to our satisfaction.
- **Yes with Caveats**: We have tested this service and found it possible to use under IPv6, but there are shortcomings — special requirements on the client side, nonstandard OS configuration, an inability to be simultaneously IPv4- and IPv6-compatible, not all features IPv6-compatible, etc.
- **Claimed**: We have not yet tested this service, but someone else that we feel has some knowledge of the matter (perhaps at another site on the OSG, perhaps the software's developers) claims that it is IPv6-compatible.
- **Claimed No**: We have not yet tested this service, but someone else that we feel has some knowledge of the matter (perhaps at another site on the OSG, perhaps the software's developers) claims that it is not IPv6-compatible, at least not as it is currently installed.
- **No**: We have tested this service and found it not to be IPv6-compatible, at least not as it is currently installed.
- **Unknown**: To our knowledge, no one has tested this service for IPv6 compatibility yet.

First Infrastructure Incompatibility Reported Friday Evening

Mail From Brian Bockleman Friday, October 3rd 16:30 EDT.

I also can't access the OSG display from my house!

It appears that (maybe recently?) IPv6 addresses was added to the DNS entry but the service is not responding on IPv6. Perhaps this is a hole in our monitoring?

Seems that everyone who responded "works for me" on this thread should go chide their IT department about keeping up with that conference on IPv6 support. :)

Brian

Problems with LVS and Heartbeat

- Operations Uses LVS for two things
  - Load Balancing
    - Works fine and no IPv6 problems
  - Failover – High Availability
    - Heartbeat – Neighbor discovery and removal
      - Doesn't seem to parse IPv6 addresses correctly in it's config
      - Documentation is lacking
      - This may be version specific
    - keepalived – alternative that has some favor with our sysadmin

The Document and Tables

- Full Document is at https://twiki.grid.iu.edu/bin/view/Operations/OperationsServicesIPv6Compatibility
- Operations Table is at https://twiki.grid.iu.edu/bin/view/Operations/OperationsServicesIPv6Compatibility#The_Table
- Software Table is at https://twiki.grid.iu.edu/bin/view/Operations/OperationsServicesIPv6Compatibility#OSG_Software_Stack

Questions???