

Dual stack tests for ALICE job submission

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IPV6 in BITP

Dual-stack services & hosts:

- TopBDII - topbdii.bitp.kiev.ua
- CE+SiteBDII+Torque+Argus - ce.bitp.kiev.ua
- VOBOX - vobox.bitp.kiev.ua
- Squid for CernVM-FS + LFC - lfc.bitp.kiev.ua
- SE(DPM)+xrootd - se.bitp.kiev.ua
- WMS - wms.bitp.kiev.ua
- VOMS - voms.bitp.kiev.ua

IPv6 network structure

Networks:

- 2a00:fc00:5:1::/64 (for CE and WNs with better bandwidth/special direct routing to CERN)
- 2a00:fc00:6::/64 (for other services)

All hosts are registered in DNS & created reverse zone

Experience with IPv6: VOBOX

By default IPv6 support is done for:

- GSISsh (Listened on 1975) - works!
- CernVM-FS client <-> Squid server - works!
- MonaLisa (Listened on 9000) - works!
- MonaLisa FTD (Listened on 1093) - works!
- ClusterMonitor (Listened on 8084) - works!

Experience with IPv6: SE DPM&xroots

- From DPM services we have DPM, DPMcopy, dpnsdaemon, rfiod enabled for IPV6 by default

```
dpm      19305 dpmmgr  6u IPv6 4197858855  0t0 TCP *:fmwp (LISTEN)
dpmcopyd 19623 dpmmgr  5u IPv6 4197859664  0t0 TCP *:5017 (LISTEN)
dpnsdaemo 19725 dpmmgr  24u IPv6 4197860102  0t0 TCP *:telelpathstart (LISTEN)
rfiod     423 dpmmgr  4u IPv6 4196263997  0t0 TCP *:complex-link (LISTEN)
```

- BDII isn't listening by default

Add BDII_IPV6_SUPPORT=yes to /etc/bdii/bdii.conf

- XROOTD: IPv6 is not supported till 4.0.0
- Problems with mysql (old version of mysql in EMI3 for SL6)

mysql-5.1.73-3.el6_5.x86_64 doesn't support IPV6

*MySQL 5.6.6 supports both IPV4/IPV6 (allows MySQL to bind to IPv6 interfaces by default)

Experience with IPv6: LFC +SQUID

- LFC daemon & SQUID are both listened on IPV6

```
tcp    0    0 :::5010          :::*              LISTEN    28355/lfcdaemon
tcp    0    0 :::3128          :::*              LISTEN    5663/(squid)
```

- Except of BDII, mysql, LFC-dli

```
tcp    0    0 0.0.0.0:3306     0.0.0.0:*         LISTEN    31493/mysqld
tcp    0    0 0.0.0.0:8085     0.0.0.0:*         LISTEN    28514/lfc-dli
tcp    0    0 0.0.0.0:2170     0.0.0.0:*         LISTEN    14545/slapd
```

- For BDII just enable BDII_IPV6_SUPPORT=yes in /root/siteinfo/siteinfo.def and re-yaim & configure 2170 port for ipv6tables
- For SQUID IPv6 support is enabled by default in [Squid-3.1](#)
- Problems:
 - Old version of Mysql for EL6 in EMI3
 - How to enable lfc-dli (?)

Experience with IPv6: TopBDII

- OpenLDAP is supporting IPv6

```
tcp    0    0 0.0.0.0:2170      0.0.0.0:*        LISTEN  8482/slapd
tcp    0    0 :::2170           :::*              LISTEN  8482/slapd
```

- We can see some connections..

```
slapd  29268 ldap 59u IPv6 267919012  0t0 TCP topbdii.bitp.kiev.ua:eyetv-
>[2001:720:1014:41:21e:c9ff:fe41:82ad]:46383 (ESTABLISHED)
slapd  29268 ldap 73u IPv6 267918916  0t0 TCP topbdii.bitp.kiev.ua:eyetv-
>topbdii01.grid.hep.ph.ic.ac.uk:33491 (ESTABLISHED)
```

- For IPv6 support just add `BDII_IPV6_SUPPORT=yes` to `/etc/bdii/bdii.conf` & configure 2170 port for IPv6tables

Experience with IPv6: CREAM CE + SiteBDII+ARGUS

- Tomcat, BNotifier, glite-lb-logd listened on IPv6
- ARGUS (pap/pepd/pdp daemons) listened on IPv6 (but I have some problems in configuration ARGUS <-> WNs)

```
java 5533 tomcat 152u IPv6 1267545926 0t0 TCP ce.bitp.kiev.ua:44805->ce.bitp.kiev.ua:8154  
(CLOSE_WAIT)  
java 7264 root 48u IPv6 1267546208 0t0 TCP ce.bitp.kiev.ua:49176->ce.bitp.kiev.ua:8152 (CLOSE_WAIT)  
java 7264 root 49u IPv6 1267545932 0t0 TCP ce.bitp.kiev.ua:58568->ce.bitp.kiev.ua:8152 (CLOSE_WAIT)  
java 7264 root 50u IPv6 1267546232 0t0 TCP ce.bitp.kiev.ua:53562->ce.bitp.kiev.ua:8152 (CLOSE_WAIT)  
java 7264 root 53u IPv6 1267546241 0t0 TCP ce.bitp.kiev.ua:51990->ce.bitp.kiev.ua:8152 (CLOSE_WAIT)  
java 7264 root 61u IPv6 238987752 0t0 TCP ce.bitp.kiev.ua:8154 (LISTEN)  
java 7669 root 43u IPv6 1267294802 0t0 TCP ce.bitp.kiev.ua:59753->ce.bitp.kiev.ua:8150 (CLOSE_WAIT)
```

```
[root@ce ~]# host ce.bitp.kiev.ua  
ce.bitp.kiev.ua has address 194.44.249.3  
ce.bitp.kiev.ua has IPv6 address 2a00:fc00:5:1::2  
[root@ce ~]# telnet ce.bitp.kiev.ua 8152  
Trying 194.44.249.3...  
Connected to ce.bitp.kiev.ua.  
[root@ce ~]# telnet 2a00:fc00:5:1::2 8152  
Trying 2a00:fc00:5:1::2...  
telnet: connect to address 2a00:fc00:5:1::2: Connection refused
```

- For IPv6 support in SiteBDII just add BDII_IPV6_SUPPORT=yes to /etc/bdii/bdii.conf
- Problems with maui, pbs_server in dual stack
- Globus-gridftp-server (?)

Experience with IPv6: WMS and VOMS (future tasks)

- WMS
 - lb-bkseverd, lb-logd listened on IPv6
 - JobControllers - > Does Condor supports IPv6 without workarounds (?)
 - Globus-gridftp-server (?)
 - For IPv6 support just add `BDII_IPV6_SUPPORT=yes` to `/etc/bdii/bdii.conf`
- VOMS
 - Voms-admin listens on IPV6
 - Problems with old version of mysql
 - For IPv6 support just add `BDII_IPV6_SUPPORT=yes` to `/etc/bdii/bdii.conf`
 - VOs Vomses are listened only on IPv4 (by default)

SO..

- ALICE job submit in dual stack works without any problems
 - After enabling IPv6 some problems were observed in the Nagios tests, not affecting production
- Iptraf shows IPv6 traffic between services/hosts
- Some services need to be reconfigured for better IPv6/IPv4
- WNs are still not configured because of problems with Torque
 - Can we try to find workaround for Torque/Maui or we need to move to other scheduler?
- Future plans:
 - To test VOMS, ARC-CE cluster for ALICE job submit with dual stack;
 - Help with testing new Xrootd 4 (with IPv6 support);

Thank you for attention!