

DAQ servers and network

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daqnet / b2nsm / b2epics

● Logical configuration

- Three parallel network: daqnet, b2nsm, b2epics
- Private network inside daqnet: COPPER, HLT, PXD, SVD, beast
- Flat network with a large number of hosts (**387** daqnet / **305** b2nsm / **214** b2epics)
- User entry point only at bdaq
- User exit point only at b2stone
- Connection to SuperKEKB network (EPICS, file transfer)

● Physical configuration

- Two physical network: daqnet, b2nsm/b2epics
- Spanned only over B3 (both sides), E-hut, on-detector, and a few lines from E-hut to B4
- 10G Ethernet backbone between bdaq and main network switch in B3
- Fiber between B3 and E-hut was recently added
- No 10G switch in E-hut yet (procure this FY?)

● Security policy

- No written policy yet
- Requested by KEK to define and provide

Host management

● Private host database

- Hostname, MAC address, assigned date, and contact person's name are kept in my private PC
- No information about the physical location of PCs
- Very often the MAC address is missing
- Some of the contact persons have already left the collaboration
- There was a case the PC was replaced (MAC address is different)
- Some hosts no longer exist

● Need a review of the database

- Should check the MAC address of all entries (by a script)
- Should check the contact person names (need to be done manually)
- Would be nice to include the physical connection info (huge work!)

● b2nsm / b2epics

- Probably it was not a good idea to separate b2nsm and b2epics address space
- Every b2nsm host probably should also have a b2epics address
(although probably b2epics only host does not need a b2nsm address)

User management

● bdaq users

- Required for local/remote shift
- B2MMS id is included in LDAP table
- **570** current users, **158** expired users

● bdaq user registration

- KEKCC account required
- Need to pass a quiz after reading some security instruction
- For many novice users who have difficulty in public key, FAQ on confluence is updated

● bdaq user expiration

- Daily B2MMS database check for expired members
- Monthly expired member list by email
(I just found the mail was not properly forwarded since June...)
- Actual expiration is done by hand
(I expired 26 more users just now...)

● Handled on my private PC

- Because it involves B2MMS, it is more complicated to implement on a more public host

Backbone servers

● bdaq

- Login server to daqnet for users (ssh to daqnet/b2nsm/b2epics hosts)
- Otherwise the usage is very restricted (not many apps are available)
- SSH connection to outside is blocked

● bdaqa

- NFS server for bdaq
- Network boot server for ttd11
- Server for various services: DNS, NTP, LDAP

● b2stone

- HTTP proxy server for the selected sites (Linux distros, software sites, ...) based on host names
- SSH-login tunnel to KEKCC, Git access tunnel to stash.desy.de
- A few more app-specific tunnels, not open to general users

● b2skbgate

- EPICS CA gateways to send / receive EPICS PVs to / from SuperKEKB
- rsync temporary storage area to transfer MDI related data to SuperKEKB

DAQ servers

Hosts relevant for DAQ operation (other than those for readout chain and environment monitors)

- **rc01, rc02**

- Global run control, HV control, and most of the centralized slow control processes

- **b2db-primary, b2db-replica, b2db4**

- Configuration DB server and two replicas

- **b2db1, b2db2**

- NSM2 master and deputy hosts

- **cvmfs-primary, cvmfs-mirror-hlt, cvmfs-mirror-ehut**

- CVMFS servers

- **b2arch1** (b2arch2 as backup)

- EPICS Archiver Appliance

- **daqslc-elk**

- Elasticsearch server

Shifter PCs

Hosts relevant for B3 and remote CR shifters (and DAQ shifters)

- **shiffl, shiftc, shifta**

- Shifter PC for operation of DQM, Run and HV Control, and rocketchat
- Lower 4 monitors in B3 control room, except the rightmost one

- **b2runmtg.kek.jp (not in daqnet)**

- SpeakApp PC for run meeting and communication to remote shifters
- Lower rightmost monitor in B3 control room

- **panela, panelb, panelc, paneld**

- Monitors for the SuperKEKB status, event display, Kibana dashboard, environment monitors
- Upper 4 monitors in B3 control room

- **remotea, panele**

- Provides VNC desktop for remote shifters

- **vnc01**

- Provides VNC desktop for DAQ shifters

Backup and disk failure

● Backup readiness

- Backup system ready — bdaq, b2stone, b2arch1, b2db-primary
- Backup system in preparation — bdaqa
- Not so sure, but probably can run on other PCs — rc01, rc02, shifter PCs
- Virtual hosts — daqslc-elk, cvmfs-primary

● Disk failure

- Disk failure occurs on readout PCs
- b2db1 and b2db2 SSD in software RAID were broken and replaced
- Software RAID disk replacement requires system shutdown, but better than nothing
- b2db-replica RAID6 SSD failure — replaced without any down time

Operating system

● SL6 or CentOS6

- Monitor PCs (monpc02, monpc03, lumi-zd01) are still running CentOS6
- KLM HV should have moved out from CentOS6

● SL7 or CentOS7

- Most of the PCs in daqnet is operated either on SL7 or CentOS7 now
- **EOL 2024 June 30, only ~1.5 years from now**

● Rockylinux 9

- No major obstacle found so far (Xorg is still supported)
- Plan to update shifter PCs (Seokhee)
- Plan to update backup server of bdaq (NFS and network boot yet to be tested)

● Old servers and Rockylinux 8

- Many old HLT testbench servers are reused now (b2stone, b2skbgate, etc)
- Unfortunately, these servers cannot run Rockylinux 9
- To cope with CentOS7 EOL, they should be upgraded to Rockylinux 8
- We'd like to replace them with by-that-time-retired COPPER readout PCs

Thoughts

● Do we need 10G Ethernet for daqnet?

- No monitoring of bandwidth / bottleneck
- Not so sure the necessity of the 10G Ethernet switch in E-hut

● Host/user management

- Would like to move out from my private PC to bdaq
- It would be nice to maintain the physical connection map

● Preparation for PC failure

- Backup PCs have never been tested?
- Many apps can be moved from one PC to the other, but never tested?
- Probably we should try a drill

● Security policy

- We will introduce a security policy on DAQ network