

Overview of MICENet

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November 9, 2015

Abstract

Overview of MICENet for internal purposes.

1 Network overview

MICENet is a class C network hosted by the RAL PPD network. Usually the non-Controls and Monitoring machines have an IP address with an host number lower than 100, while all other IP addresses (100-253) belong to Controls and Monitoring machines. The network switch is a Hewlett Packard 5406R z12 replaced on January 2015.

The IP address is DHCP assigned but every machine always gets the same IP address each time. A DNS server is used, while two fail-over servers are in place.

The network can be isolated from the external network without causing any problem to the normal activity (data acquisition included). A dedicated network link is in place with the ISIS network.

ACTION: static IP address can be assigned to critical machines.

1.1 SSH access

The access on all the machines on MICENet is permitted through the PPD bastion called `mousehole` hosted by the PPD. The login on the `mousehole` is available using ssh key pairs. Access to OPI machines is available using `epics` account. The other accounts used around MICENet are `mice` and `daq`. Access to IOC machines is available only using a specific password protected ssh key.

2 Machines

2.1 Operator Interface (OPI) machines

The OPI machines are general purposes EPICS client interface PCs. These include the Intel thin clients refurbishing the Control Room, a couple of desktop machines in the hall and three EPICS laptops allowed to connect into the MICENet.

Table 1: IOC machines

IOC machine	description	H/W connected	network dependencies
miceiocpc1	trackers IOC		
miceiocpc2			
miceiocpctk			
miceiocpc1	HV IOC		
miceiocpc2			
miceiocpctk			
miceiocpchv			
miceiocpca			
miceiocpcb			
miceiocpcc			
miceiocpcd			
miceiocpce			
miceiocpcf			
miceiocpcg			
miceiocpch			
miceiocpci			
miceiocpcj			
miceiocpck			

2.1.1 Dependencies on other machines

One OPI machine should be able to login into an IOC machine to start the RunControl. One OPI machine should be able to run the DAQ software.

ACTION: disable ssh into IOC machines when we are running (can we start the RunControl from a general OPI?).

2.2 Input/Output Controllers (IOC)

General purpose EPICS server PCs used to provide software derived EPICS variables to the system as in Table 1.

2.2.1 Dependencies on other machines

The machine running the RunControl should be able to access in read and write mode the master CDB and of course need to communicate with the DAQ. If configuration scripts (tracker, hall probes, etc.) are going to be run from the RunControl other machines need to be directly accessible as well.

2.3 Data Acquisition (DAQ) machines

The DAQ machines include the Local Data Concentrator machines (which blindly reads out a crate and stuff numbers into the event building and the data-taking user-

interface (DATE)) and the Global Data Concentrator machines (which combines all the data together and does the control, event building and writing to disk).

2.3.1 Dependencies on other machines

The Global Data Concentrator machines should be able to access the Online reconstruction machines.

2.3.2 Target machines

Target machines are two DAQ machines and they serve several purposes. They communicate with the target controller and issue instructions to the controller for the operation of the target. They collate digital data read back from the target controller, this data gives both status and operational data. These machines also read the output from a daq card located in a PCI slot in the target controller PC. This card digitizes several analogue signals from target/ISIS related sources. Communication with the daemon is done via RATS, a php based server that can be run on a web client.

2.3.3 Dependencies on other machines

Should be possible to restart the RATS daemon from an OPI machine in the MLCR.

2.4 Configuration Data Base (CDB) machines

The Configuration DB is considered to be the actual database plus the web service that gives access to the database. Right now there are three separate copies of the database running in the MLCR (master machine) and on two different PPD machines (slave machines). Write access to the master machine is possible only from the MICENet. Access to the data by other users is provided on a publicly accessible machine `cdb.mice.rl.ac.uk`.

2.4.1 Dependencies on other machines

NTR

2.5 Gateway machines

One machine is the EPICS channel access gateway machine, that provides read-only access of any EPICS variable through `mousehole`. This permits remote monitoring of the status of any equipment or variable that may be of interest to a collaborator.

The other machine constitute a link between MICENet and the ISIS machines that provide the beam values to EPICS: beam loss values and beam intensity are passed to EPICS through this gateway.

2.6 Online and Offline reconstruction machines

The Online machines are used for

- online diagnostics of the detectors during the running of MICE, i.e. run MAUS online reconstruction,
- online diagnostics of the DAQ during the running of MICE, i.e. run online monitoring,
- process the tracker calibration,
- upload MAUS real time reconstruction output.

The Offline machine will be used for the real reconstruction of the raw data, a feasible alternative to the reconstruction on the Grid.

2.6.1 Dependencies on other machines

The machines should be able to export files to the DAQ Global Data Concentrator machines and to the datamover machine.

2.7 Web Cams

A number of network IP cameras have been deployed around the MICE Hall. Images and streaming video are accessible from within the RAL site network and MICENet, and still images are also captured once a minute and made available via the a web page.

2.8 Data storage machines

A machine (`migestoreea`) is used as shared data cache, receiving the data from the DAQ concentrator machines moved by the `datamover` script.

The datamover machine upload tarballs of the data held on the shared data cache to the Grid.

A NAS drive is used to hold selective backups of various machines on MICENet.

2.8.1 Dependencies on other machines

Online and DAQ machines should be able to connect to the data storage machines, included the backup drive that is NFS mounted.

3 NFS mounts

A `Data` folder is NFS exported on most of the machines, containing the Archiver data, the tracker Hall probes output and other configuration files; 1.6TB are available for other shared data.

Part of the EPICS software is exported from one EPICS client in order to have machines easily synchronized.

ACTION: Could `epicsPro` be an NFS mount?