Online Summary

We had three items in the online session on Wednesday morning:

Online Group Update and Plans   **Myself**

A talk about Spares for the experiment   **Craig Macwaters**

DAQ Overview   **Yordan Karadzhov**

Online Group Update
and Plans

Responsibilities

The Online group is responsible for:

Infrastructure
- Computers in the rack rooms and the MLCR
- Spares and Maintenance
- Overview of MICE-Net and Network Switches

Oversight of
- DAQ
- Online monitoring
- Data Mover
- E-Log

Interface with Operations, RAL Networks and MICE Computing

Controls and Monitoring is now its own group but the two group share Wed meetings on a biweekly basis – one meeting has a controls focus the subsequent meeting has an online focus.

Responsibilities – Step IV Readiness

It is the online groups responsibility to ensure that the machines and daq are ready for data taking at Step IV. Additionally we are required to be in a position where we can respond quickly to any problems, minimising the possibility of the experiment suffering significant downtime due to machine/network problems.

- **Integration** – Ensuring the smooth integration of computers onto micenet. This requires planning. It also required co-operation from other groups.

- **Pro-active** – Trying to establish possible causes of failure/problems before they happen and to have suitable plans in place. E.g. spares, backup of critical servers.

- **Staffing** – To ensure a suitable body of knowledgeable individuals are on-call to provide assistance when required.

- **Documentation/Procedures** – To improve the user documentation so that a trained MICE user can ensure that the computers are both in a healthy and functional state and that minor problems can be resolved quickly. Test procedures.

Networking Summary

We tried to swap the mice gateway over in late May so that access to MICENet could only be made through mousehole. Unfortunately this was not successful and this had to be reversed. (Certain epics PVs could not be accessed through mousehole making remote monitoring of the DS impossible)

We will try this again later on in the year – hopefully have a technical solution and be better prepared. (heplnv154 will be a test machine to simulate the firewall on micenet.)

In early June one of the network switches was swapped out as network dropouts were being regularly observed in the switching stack. Unfortunately this hasn't solved the problem and we are still seeing network dropouts. This is a critical issue as the whole network becomes unresponsive for about a minute during one of these dropouts.

We have been working with RAL networking on this issue but the reality is that we are likely to have to purchase a new network stack. (I think these are a few £k a piece). We will be taking advice on this issue.

Control Room Upgrade

We are going to give the control room a facelift!

We are introducing a number of very small Intel NUC devices into the control room. These will serve as the operator PCs and provide a uniform and flexible interface to the server PCs in the rack room by enabling any NUC to access any server. Each NUC will also permit connection to two high resolution displays, increasing the amount of usable screen space in the control room.

One (or both?) of the monitors next to the door will be KVM'd to all the machines in the server room so that we have direct access to all of the machines.

The control room will be redecorated and tidied up. New keyboards, mice, monitors, additional storage in the rackroom..

We will be moving to an electronic whiteboard system. This will be to notify shifters and hall staff/visitors of important information.

We are looking at utilising two of the existing desks in the current overflow space just outside of the MLCR. We will retain the old whiteboard on the wall outside there for all the doodlers.

3 seating positions - shorter desks and remove the curved section
Double HD monitors at each desk (1920 x 1080)
Large monitor/TV on Wall for the alarm handler and other status information

Control Room Upgrade
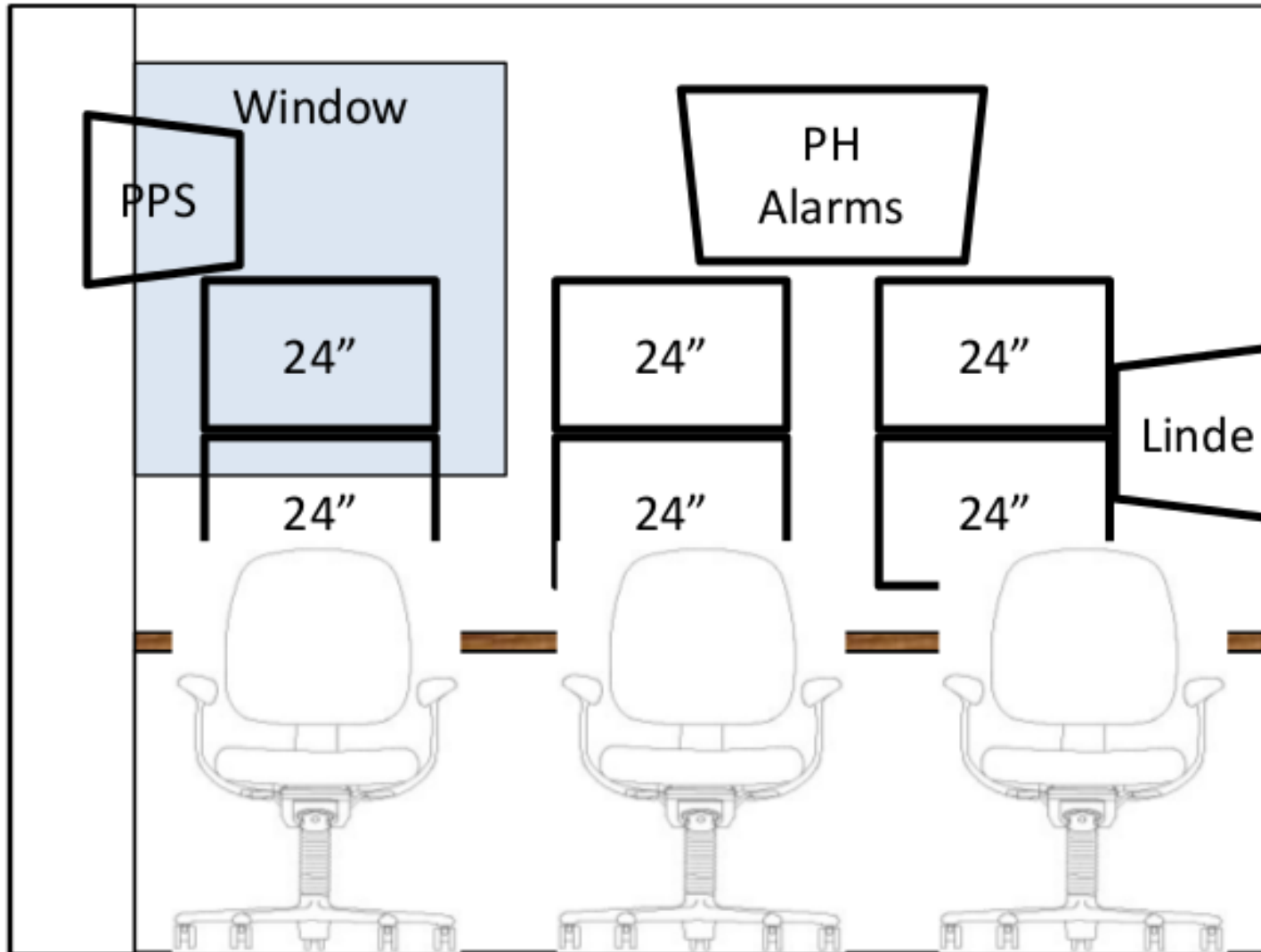
3 seating positions - shorter desks

Double HD monitors at each desk (1920 x 1200)

Whiteboard to be replaced with an electronic whiteboard (current whiteboard to be placed outside of MLCR)

Aim:

- To provide a spares and replacement service of "mission critical" electronic items to allow the reliable running of MICE Step IV operations
- More formalised version of what I do now
- To be point of contact when a problem occurs, particularly if electronics owner is not at RAL
- To hold stock of lead-time items
- Not hold items we can get in 24Hr from RS, Amazon, Scan, Ebuyer etc.

Details

- Will have conversation with Roy about available budget

- Remember mission critical items only

- Keep current available spares list on Excel sheet on MICEmine

- Sent out email to System managers 1st May to distribute

- If I do not get a list of spares back from the electronics owners then I will assume they are sorting out their own kit & problems. If they are not present at RAL could prove difficult!

- I will only be operating a basic debug and swap out service. The owners will need to support this and be involved. Beyond this it is there responsibility to get their kit back online

Slide From Craig MacWaters Presentation – 25/06/2014

New trigger system for MICE based on CAEN V1495

CAEN V1495 - General Purpose VME Board

1. Spill gate generator
   - All parameter are controlled by the user.
   - Possible to enable/disable all type of events (Start of spill, End of Spill, DAQ event and Calib. event)

2. Particle trigger generator
   - Trigger condition controlled by the user;
   - Trigger condition masks controlled by the user;
   - Pulser trigger with constant frequency;
   - Pulser trigger frequency controlled by the user;
   - Randomly generated pulser triggers.

3. Data recording
   - Trigger pattern and time recorded in a FIFO;
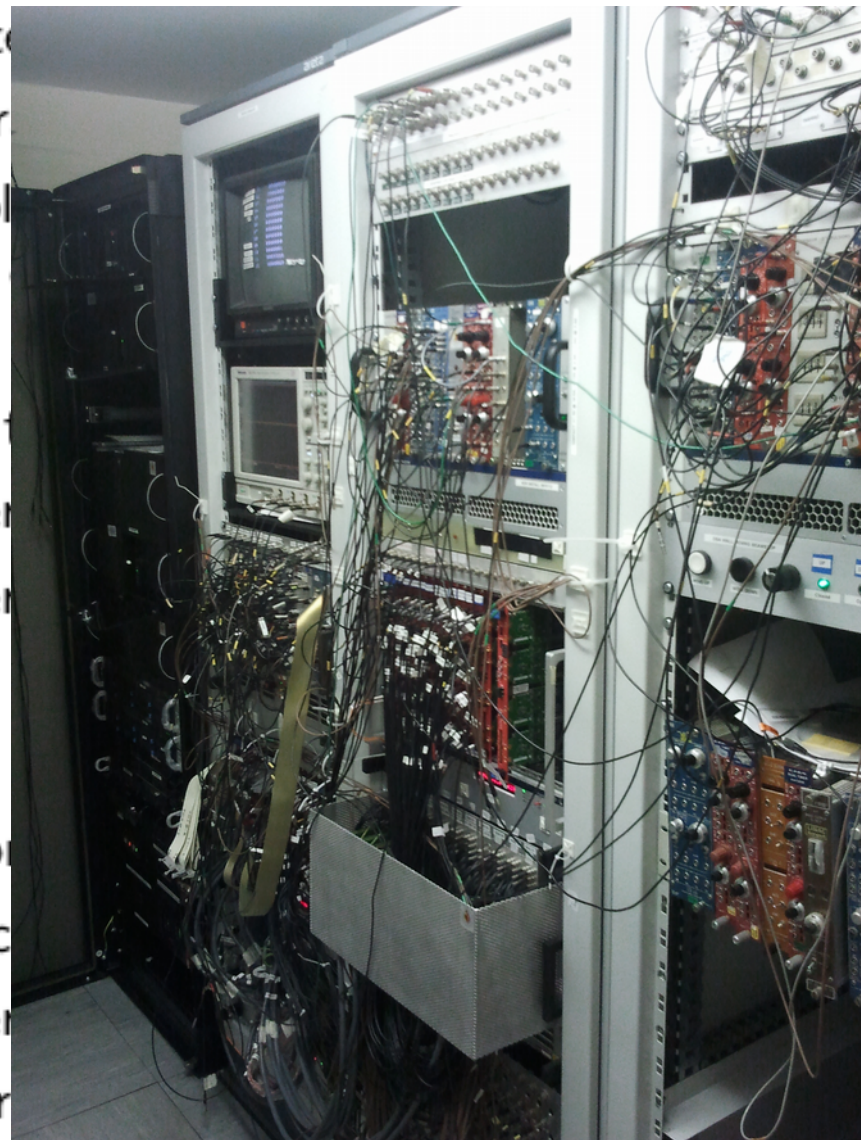   - FIFO readout through the VME bus.

New trigger system for MICE based on CAEN V1495

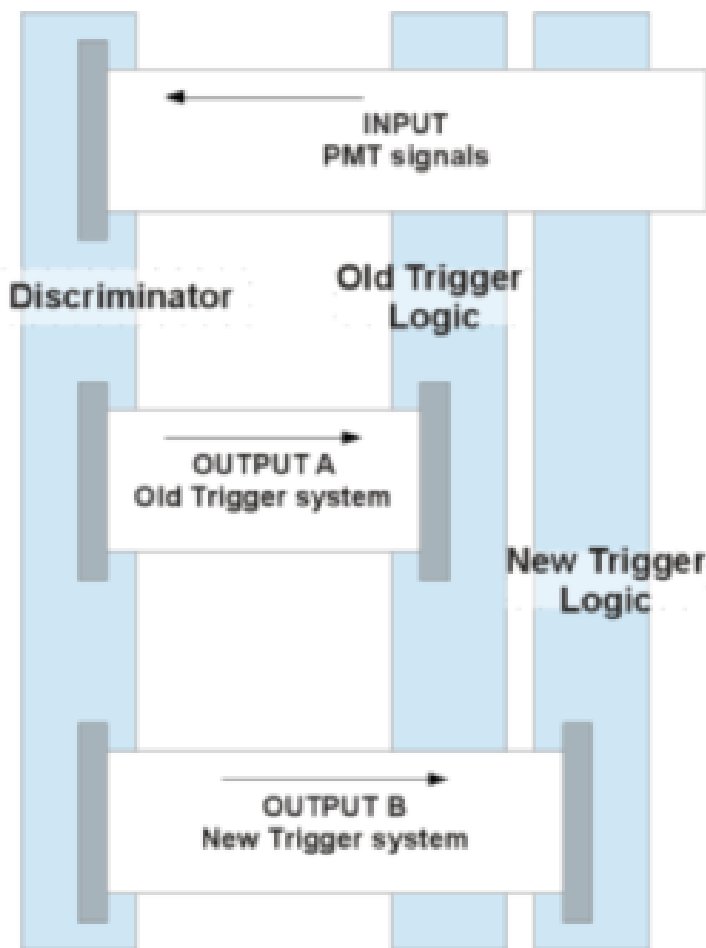CAEN V1495 -
General Purpose VME
Board

1. Spill gate
   - All par
   - Possibl   ts
     (Start   d
     Calib.
2. Particle t
   - Trigger
   - Trigger   user;
   - Pulser
   - Pulser   user;
   - Random
3. Data rec
   - Trigger   O;
   - FIFO r

DAQ test - 6th April 2014

Test of a new trigger system for MICE, based on a programmable FPGA logic

Goal: create a setup in which the old and the new system will work in parallel and compare the output of the two systems.

- The first output of the discriminators feeds the old trigger logic (unchanged).

- The second output of the discriminators, which originally goes to the TDCs has been connected to the new trigger logic.

- Outputs (Particle Trigger and Particle Trigger request signals) of the both systems are connected to a TDC for time measurement.

Results of the test:

- The integration of the new board into the MLCR DAQ has been tested;
- All triggers generated by the old system are presented also in the output of the new system.
- The new system generates $\sim 10\%$ extra triggers, which are not register by the old system.

Current status:

- The old trigger system is still in place;
- Switching between the old and the new system is quite trivial and takes ~20 min.
- Final test of the new trigger system is scheduled for June 29th. This test will include a data taking with the full MICE DAQ and new TOF calibration.

Conclusions

I think that the main direction that the online group has to take is to ensure that the computing is robust enough that it can take whatever Step IV throws at it. Primarily I see the following as priorities:

Being able to deal with machine/parts failures (and the same for DAQ).
Having the correct spares and backups in place.

It is important that system owners contact Craig with a list of their requirements for spare components.

Detailed understanding of what machine processes need to be running & suitable test procedures so that we can check that these processes are running.

Having the correct documentation so that there is a defined chain of events when failures occur.

There is a requirement for suitable on-call expertise – This will be addressed very soon.

Congratulations to Yordan on the new trigger system – this will prove to be a big improvement upon the present trigger system!