Ros Expert Training Note
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20/05/2012
Based on training from Markus

Important Links

https://twiki.cern.ch/twiki/bin/viewauth/Atlas/MaintenanceOfROSOnCall

https://twiki.cern.ch/twiki/bin/viewauth/Atlas/MaintenanceOfROS

https://twiki.cern.ch/twiki/bin/view/Sandbox/HowToUseGrape

https://twiki.cern.ch/twiki/pub/Atlas/MaintenanceOfROSOnCall/ros-software-tools.txt

https://twiki.cern.ch/twiki/bin/viewauth/Atlas/ROSInterventionRecords

If there is no data

There could be a problem with the physical read out fibres, in which case you would need to identify the subsystem which is causing problems and contact the respective systems expert so you could diagnose it together.

The transceiver itself could be broken.
The first test is to swap the seemingly broken transceiver with a working one. If the problem follows the broken transceiver then that is the problem but if the problem stays on the same input line then there is a problem with the ROBIN in that slot.

There could be a problem with the transceiver on the ROD which is sending data to the ROS in which case you need to contact the ROD expert.

If a power supply fails

The power supplies are built to be redundant so the ROS pc can function with 2 or even 1 (?) working. Therefore this is not a reason to go to Point 1. Replacing a power module is done between data taking. In addition Markus should be the one alerted to this via system checker emails.

Using /proc/ to diagnose

To access the /proc/ folder on the ROS pc you first need to:
ssh lxplus
ssh atlasgw
Once access is granted you should connect to one of the spare pcs for safety.
Hostname: pc-tdq-ros-spare-00 (00->03) : 4 spares

Note in the spare rack: 00,01 have the old hardware in; 02,03 have the new hardware.

/proc/io_rcc

Driver which bypasses the OS on computer.
If this file is not here then the io_rcc driver is not loaded and the computer needs rebooting.

At the top of io_rcc should be : “IO for release tdaq 04-00-01”
These are the drivers used for 2012 data taking (and should appear elsewhere in log files).

/proc/cmem_rcc

/proc/robin

The pci firmware (FPGA design ID) should match the driver firmware : tdaq 04-00-01
If not, the firmware will need to be updated.

It is important to note there are ROS problems and then ROD problems manifest on the ROS and to distinquish between the two.

MBOX2 error in /proc/robin

If there is a memory box error appearing in /proc/robin then there are three things to do:
1) Soft reset of ROBIN (using robinscope (-R))
2) Power cycle PC (using Grape?)
3) Replace ROBIN
Note none of these are to be done during data taking as a reset will clear the buffer of collision data.
Wait until data taking has finished – ie other buffers are empty.
Note only option 3 requires going to Point 1 and is the last resort.

Link error in /proc/robin

Could be a broken transceiver or a broken fibre optic.

Link up in /proc/robin

If this is yes then the fibre optic is working so if data is not being received it is not the fibre.
If this is no, check that the subsystem actually uses it. Some do not use multiples of 3 in their output, if this is the case any not being used will be listed at the end.

Xoff in /proc/robin

This flag tells the ROD to stop sending data because the buffers are full. This flag is activated when:
1) The HLT is not sending the clear flag when the fragments are recovered -> contact data manager
2) The ROD is sending bad L1 flag data so the HLT will not collect it, causing it to fill the buffer.
-> In either case, this is not a ROS problem, so redirect to HLT or ROD as necessary.

Testmode in /proc/robin

If active the readout link has gone into testmode which can only be achieved if the ROD forced the link into this state.

ROL emulation in /proc/robin

If yes, this implies a problem with the configuration database.

FIFO in /proc/robin

If FIFO == 128 ; nothing is using that ROBIN
If FIFO < 128 ; something is running – data is in the buffer
Can ONLY power down a pc if all the FIFOs are == 128 (ie not data taking)

GRAPE – Graphical ROS Application Package

A java based applet which provides a graphical interface to /proc/robin and other tools.

Select the ROS pcs with the host names and put into the selection.
Action tabs will execute the commands on the selected pcs.

Always start with **ping** because this checks the pcs are active and will return the selected pcs as a check.

In **sensor data** – 3.3V should be > 3.1V
If the extra ROBIN power cable was not attached this voltage would be low.
Hence to fix -> check the cable in the pc and attach.

If any other voltages are low, replace the whole pc and report.

When replacing a pc, or if the onboard battery is replaced, check the BIOS configuration as the BIOS is forgotten when the battery is replaced.

In **sensor data**, the number of fans should be **4** or **6**, any odd number is bad!

In **sensor data**, the power supply has a reverse logic bug:
critical = okay
okay = bad!

Best to check this sensor data after any pc has been worked on.

If a PC or network card is replaced, always note down the ATLAS ID etc and contact the SysAdmins.

ROBINSCOPE

Option	Info
-h	To see the help menu
-m	ROBIN card number (0,1,2,3) -> Get from /proc/robin tables
-l	Optical link number (0,1,2) -> Get from /proc/robin tables
-P	Ping ROBIN card given in –m
-s	Status information - serNum - Serial number If a ROBIN is invisible, will be able to see the other 3 serial numbers here to physically identify the problem card/slot - swVersion (firmware) – PowerPC - designVersion (f/w) – fpga - mostRecentID – L1 ID of the last complete event received by ROBIN This allows you to check the events sent (from ROD) vs. events received (by ROS) Useful for diagnosing fibre/transceiver issues. - rolXoffStat – Number of full buffers counter – see Xoff above for diagnosis - rolDownStat – Number of times the link has gone down -> Should be 0 If it is not, implies hardware problem (transceiver)

	- fragStat[] – input information – fragments received since last reset Should be the same across all channels related to L1 data - frags available : no. fragments sent to HLT - frags not available : times HLT tried to get fragments no longer on the ROBIN - pending : HLT request flag received but not received L1 fragment yet - added : no. of received that were okay and added to memory - deleted : no. of fragments sent to HLT and deleted (should = frags available) - truncated : if ROD sends too much data it will be cut -> ROD problem - corrupted : has reconstructable L1 ID but fails sanity checks -> ROD problem - rejected : cannot reconstruct L1 ID so deleted -> rejected and corrupted events are sent to the error dump stream the TDAQ offline shifter will check - replaced : fragments overwritten with new fragment with same L1 ID due to out-of-sync issue with ROD -> Can see this is useful for ROD diagnostics, less so for ROS hardware faults -> Subdetector experts have **littlejohn** which is a stripped back robinscope
-c	Configuration parameters - pagesize – value in column value : 512 = 2kb ? - maxRxPages – (maxRxPages*pageSize) = max size for an event -> truncate if bigger - RolEnabled – if 0 : ROBIN does not receive data from ROD (okay if no data taking) - DiscardMode – if 1 : the expert program running can disable ROL on the fly If data is sent on the ROL from ROD it will not be received ➔ Useful to check ROL is even active if data from ROD is not being received
-e	L1 ID in memory dump
-r	Reset the readout link in line –l <0|1|2> Use this when swapping transceivers and find both are now down
-R	Reset the ROBIN -> Resets the PowerPC application - This is a soft reset of the ROBIN (ie MBOX error) and should not be done during data taking as buffer is cleared.

Firmware Updates

Any ROBINs replaced by a ROBIN in the spare cupboard are likely to be old and need updating.

In the TDAQ shared area -> update scripts : update_fw_<num>.sh
-> Currently 04-00-01
/proc/robin enumerates the ROBINs -> Need to know the number to update it
ssh to the pc in question and run : ./update_fw_04-00-01.sh <number_of_robin>
Check /proc/robin driver information to make sure it worked.

Network Card

If there is a network card issue, check that ping is received and check ifconfig from the pc (if can ssh in) to check the information.