RoIB/ROS/DAQ-HLT Integration
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Timetable for Integration Tests

Why bother (what do we learn)?

What resources are needed?

What do we say in TDAQ Workshop?

Timetable for Integration Tests

- **We have a longstanding commitment to ROD/RoIB tests**
  - originally planned for mid 2000, but delayed by our need to develop DSS for link tests.
  - Now suggested for Feb-March 2001, probably at CERN
  - Needs R-ROD Xilinx code to be completed.
  - Possibly concurrent MIROD/Emulated-CTPD RODs with the RoIB.

- **We have the option to test RODs with ROS (i.e. ROB) at about the same time.**
  - R-ROD or D-ROD or both?

- **Atlas plans a series of DAQ and HLT integration tests from now to June 2002**
  - Beam tests March-June 2002, probably clashing with vertical slice tests in Heidelberg.
  - LVL1 could take part in this with or without calo trig

- **We may want other "external" integration tests before installation in the pit.**
  - When?
  - Which Atlas Detectors and/or DAQ/HLT?

- **We should adopt a viewpoint before discussions in TDAQ Workshop 13-17 Nov 2000.**

Why Bother (what do we learn)?

- **Hardware and software need to be fully tested in home institutes before any integration makes sense. Therefore assume that this has been done.**

- **Consider ROD -RoIB Tests**

- **Generate RoI event fragments, pass over S-Link data, check format and content.**
  - **This check is almost redundant.**
  - **We are using standard S-Link I/O modules**
  - **We will have already checked the data by ourselves using DSS.**
  - **"Almost" means that we check for mis-interpretation of RoI packet format built into RoIB or ROD.**

- **Operate near phase-space margins**
  - **Verify that errors are properly handled, back pressure works, time-outs fire and are correctly processed. Use high statistics fast random data to check for rare error conditions.**
  - **Another almost redundant check provided that individual components have been checked.**
  - **"Almost" means that we check for things like unexpected real-time behaviour when errors are generated.**

- **A similar situation applies to other I/O links which can all be pre-tested before other integration tests.**

Why Bother (what more do we learn)?

- **Run the prototype online software**
  - Verify correct behaviour with ATLAS DAQ for run control, messages, etc.
  - Check common understanding of databases, run types, setup conditions, etc.
  - Check that system initialisation is fast, correct and reproducible.
  - Use common test vector definitions (e.g. what data is RoIB expecting to see?)
  - Study cross-partition L1A and Busy handling.
  - Try calibration sequence generation.
  - Explore DCS operation.
  - Since the software was fully tested in home institutes, all this is known to work.

I don't believe it! Hands up anyone who thinks this was true for any test we have done in the last 9 years.

1. We will end up running integration tests with imperfect hardware and/or software.
2. The tests will find bugs and system features that are hard to discover in other ways;
3. Integration tests will also find bugs in other systems
   - which stop our system working.
   - Hopefully before their designs are frozen.

What resources are needed (for tests with RoIB, ROS, DAQ/HLT)?

- **Answer: Hardware, Firmware, Software, Test-vectors, People and a Calorimeter.**

- **Hardware.**
  - **For RoIB/ROS: One ROD, One DSS. CPUs?**
  - **For DAQ/HLT integration, as much of vertical slice as possible.**

- **Firmware**
  - **As for our own tests. R-ROD for RoIB Tests**

- **Software**
  - **DAQ-1 daq system to control and monitor, as needed for our own tests.**
  - **Automated as much as possible.**

- **Test-vectors**
  - **Need to be defined and generated.**
  - **Those used for our own tests could be sufficient, but needed by Feb/March 2001 for R-ROD.**

- **People**
  - **RoIB/ROS tests: 1-2 L1Calo people for 1 week.**
  - **DAQ/HLT tests: Potentially 2-3 people for 6 weeks.**

- **A Calorimeter**
  - **Must have L1 trigger tower output if L1Accepts are to be generated from calorimeter data!**

What do we say in TDAQ Workshop?

Key questions for DAQ/HLT tests are:

- How complete must our own vertical slice tests be before we can take part in Cern tests?

- Will a calorimeter with L1 towers be available in the beam in Spring 2000?

- Will a calorimeter with L1 towers be available in the beam later at a time suitable for us?

(a) We will/will not take part in ROD/RoIB tests in 2001;

(b) We will/will not take part in ROD/ROS tests in 2001;

(c) We will/will not take part in DAQ/HLT tests in 2002

(d) We would like to do integration tests in 200X with the following parts of ATLAS…………