CERN IT Department

HEPiX Spring 2008 Meeting
May 5th to 9th, CERN

After C5 Report

Alan Silverman, Tim Bell, Tony Cass, Alex Iribarren, Andreas Peters

- Held at CERN for the first time since 1992
- Attracted 93 registered attendees
- Over 65 submitted contributions
- Started each day with a plenary on LHC, LCG, openlab, etc
- Split agenda into topics of which 4 will be summarised today
- All overheads online at http://indico.cern.ch/ conferenceDisplay.py?confId=27391
- Full report available in CDS as 2008-05-19

- ## Some random highlights
  - Best attended talk was from Google on their impressive (to say the least) cluster sizes and the volumes of data they deal with
  - Most entertaining talk was from Charles Curran on how to make better use of magnetic tapes
  - Most scary talks were from Romain Wartel and Lionel Cons on (lack of) security, especially on the web
  - Talk from Sweden on the good news that IPv6 is (still) coming. [Oh yeah? But when?]
- ## Next meeting is in Taiwan on Oct 20 to 24.

- **Excerpts from Site Reports**
  - FZK has merged with Uni Karlsruhe and they now run a combined computer centre
  - LAL fighting harmonics in their power network
  - RAL had a fire alarm which closed down access control and prevented support staff re-entering to fix the problems
  - RAL moving to CASTOR (from dCache) while CNAF is moving away (to GPFS and TSM)
  - TRIUMF is one of only a handful of sites taking Windows VISTA seriously
  - BNL has installed a SUN/STK for their HPSS service
  - SLAC dominated by staff layoffs due to DoE budget cuts (as is FNAL which sent only one person)
  - SLAC have installed a second SUN Black Box container

Vista policy

- **Vista Deployment Policy**
  - Do not force people to run Vista if they do not want
  - Encourage people who could run Vista to try and to run it
    - allows smoothly increase number of Vista computers before XP will have to be phased out

- **Vista SP1 brings performance and reliability improvements, however requires significant effort to deploy**

- **Vista x64 will soon be available at CERN**

CD player story – episode 2

DON'T STAY WITH OLD TECHNOLOGY TOO LONG!!!

Subject:

Dear ____,

(...)
About cassette player, I asked to factory.
Unfortunately, this equipment is no longer available but it's still possible to play music on cassette through AUX input.
You will just need a male-male cable (7.- Sfr at Mediamarkt store) and a walkman which could be plus on it.
Easiest and cheapest solution.

Have a sunny day,

Oliver

Scientific Linux Outlook

- ## Scientific Linux
  - Talk from Troy Dawson (Fermi, SL maintenance team)
  - Maintain older versions (SL3 and SL4) until October 2010
    - Grid middleware availability on SL5 ? Autumn 2008
    - Some ongoing work to update OpenOffice and firefox
  - Roll-out SL5
    - Redhat Enterprise 5.2 due soon
    - Base for SLC5
  - Enhance XFS integration since widely used ?
    - Include XFS kernel module in SL5 as standard
  - SL6 outlook
    - Synergies with CentOS ?
    - Why not drop SL all together ?

CPU Technology Track

- CPU-Level Performance Monitoring with Perfmon - Andreas Hirstius

- Status Report from the Benchmarking Working Group - Helge Meinhard

- The CERN Benchmarking Cluster - Alex Iribarren

- Benchmarking ATLAS Applications - Franco Brasolin

- Benchmarking CMS Applications – Gabriele Benelli

- Benchmarking ALICE Applications – Peter Hirstov

- Benchmarking LHCb Applications – Hubert Degaudenzi

- Benchmarking in Production Environment – Iwona Sakrejda (LBNL/NERSC)

CPU-Level Performance Monitoring with Perfmon

- By Andreas Hirstius (CERN)
- Perfmon: interface to CPU's performance counters
- Tools improved to cope with HEP/CERN software
- No measurable performance impact

Test	SPECint2006	SPECfp2006
std. SLC4.6 w/ std. Kernel	34.26	25.60
std. SLC4.6 w/ 2.6.24.2 Kernel & perfmon patches & pfmon *inactive*	38.16 (111%)	27.77 (108%)
std. SLC4.6 w/ 2.6.24.2 Kernel & perfmon patches & pfmon *active*	38.23 (112%)	27.78 (108%)

CPU-Level Performance Monitoring with Perfmon, II

- ## SPECint2000:
  - ~1% floating point
  - Slightly faster in 64bit mode

- ## SPECint2006:
  - ~0.1% floating point
  - Slightly faster in 64bit mode

- ## SPEC2006 C++:
  - 10-14% floating point
  - Slower in 64bit mode

- ## LXBATCH Public sample:
  - ~10% floating point (~70% 32bit, ~30% 64bit)

Status Report from the Benchmarking WG

- By Helge Meinhard (CERN)
- Introduction, Motivation
- Agreed environment:
  - Default SL4 64bit, 32bit benchmarks
  - GCC3 compiler
  - LCG-SPI flags (`-O2 -fPIC -pthread -m32`)
- Agreed methodology, benchmarks:
  - Multiple parallel runs
  - SPECint2000, SPECint2006, SPECfp2006
- 15 machines (DESY, RAL, INFN, CERN)
- Summary of preliminary results

The CERN Benchmarking Cluster

- By Alex Iribarren (CERN)

- Description of the Benchmarking cluster
  - 11 machines
  - Representative sample of our CC

- 9 benchmarks
  - SPEC2000, SPEC2006, 32bit, 64bit, rate, parallel

- Conclusions:
  - SPEC2006 scales well with SPEC2000
  - 64bit is better than 32bit
  - Parallel is better than rate

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- **By Franco Brasolin, Alessandro De Salvo (INFN)**

- **ATLAS Benchmark Suite**
  - KitValidation: software testing framework
  - Global KitValidation Portal

- **Preliminary results based on ATLAS release 12.0.6**
  - Currently rerunning with release 14.1.0

Benchmarking CMS Applications

- ## By Gabriele Benelli (CERN)

- ## Benchmarks with CMSSW_2_0_0_pre5 release

  – 7 different physics processes

  – GEN, SIM, DIGI, RECO

  – Future work: CMS benchmark suite

- ## Some results:

  – CMS scales well with SPEC

  – Some benchmarks are much better with AMDs

    • Especially RECO for simpler events

  – CMS scales very well with the number of cores

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- By Peter Hristov (CERN)
- Benchmarks:
  - 2 different types of events
  - GEN+SIM, DIGI, RECO
- Results:
  - ALICE scales well with SPEC
- Raised interesting questions about error estimates
  - Currently being investigated by the WG

Benchmarking LHCb Applications

- By Hubert Degaudenzi (CERN)
- Benchmarks:
  - Gauss: generation and simulation
  - Brunel: reconstruction
- Results:
  - Scales well with SPEC
  - Scales better with int than fp
- Need more tests

# Benchmarking in Production Environment

- By Iwona Sakrejda and Jay Srinivasan (Lawrence Berkeley National Laboratory NERSC)

- Hostile environment
  - No control of network or storage load
  - Different storage pools

- Observations:
  - AMD architecture well-suited for their workloads
    - But you need to have enough memory
  - Multi-core systems need more bandwidth
    - Need to upgrade network infrastructure

DATA CENTRE MANAGEMENT
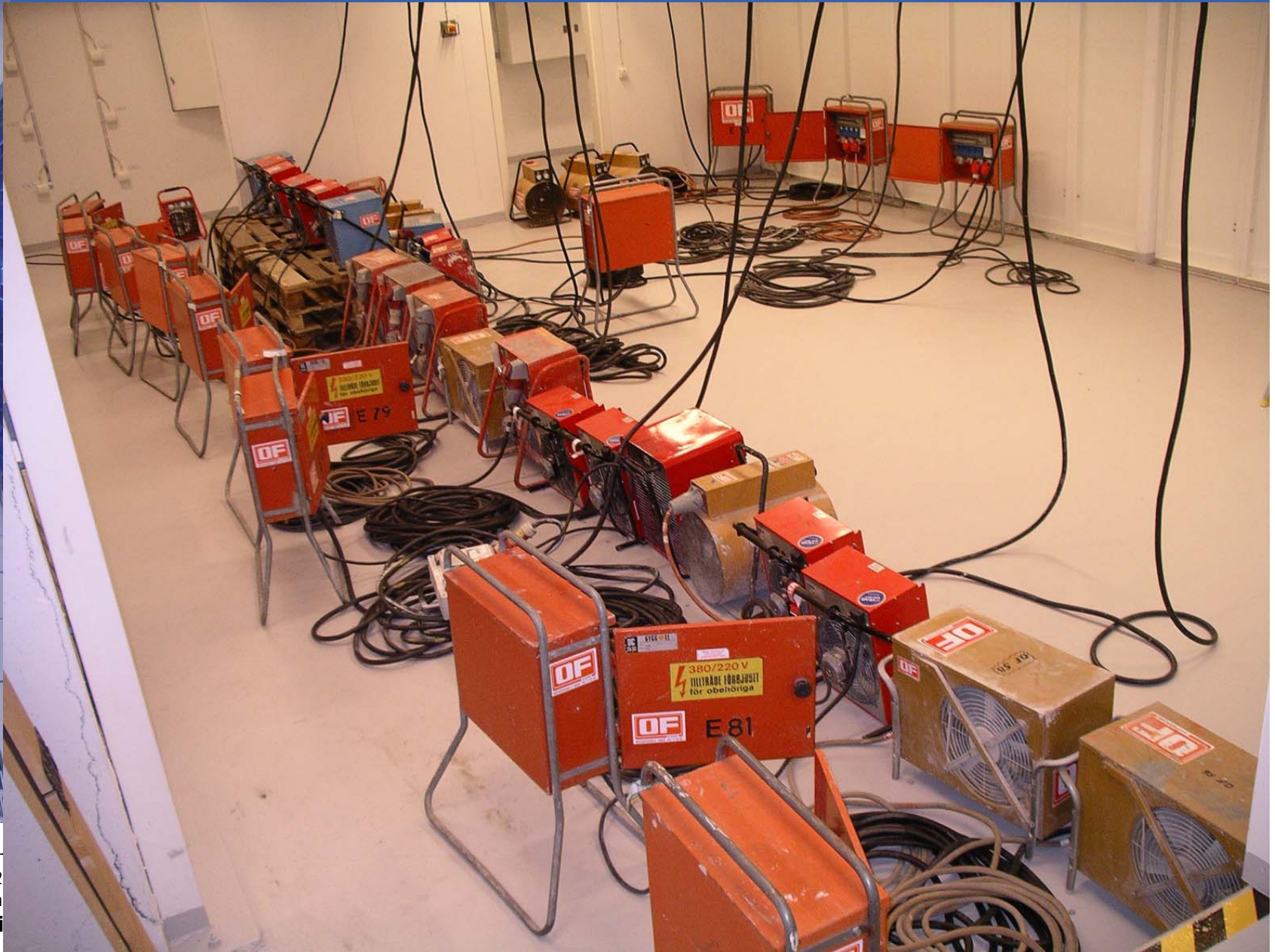
Infrastructure Trends...

- Power Density: Up

- Machine Room Temperature: Up

  – Machine Room Noise: Up

    • Why on earth do you want to be in there?

- Cold/Hot aisle enclosure

- Rack standardisation

- Increasing rack depth

  – Sun and IBM going in the opposite direction...

- Increased environmental monitoring

- "Go" to "In Service": ~2 years

  – BNL managing 18 months, through keeping size and budget down; 30 months seen as more typical.

  – Do we have a ~2 year model now?

A worrying issue?

Monitoring/Management
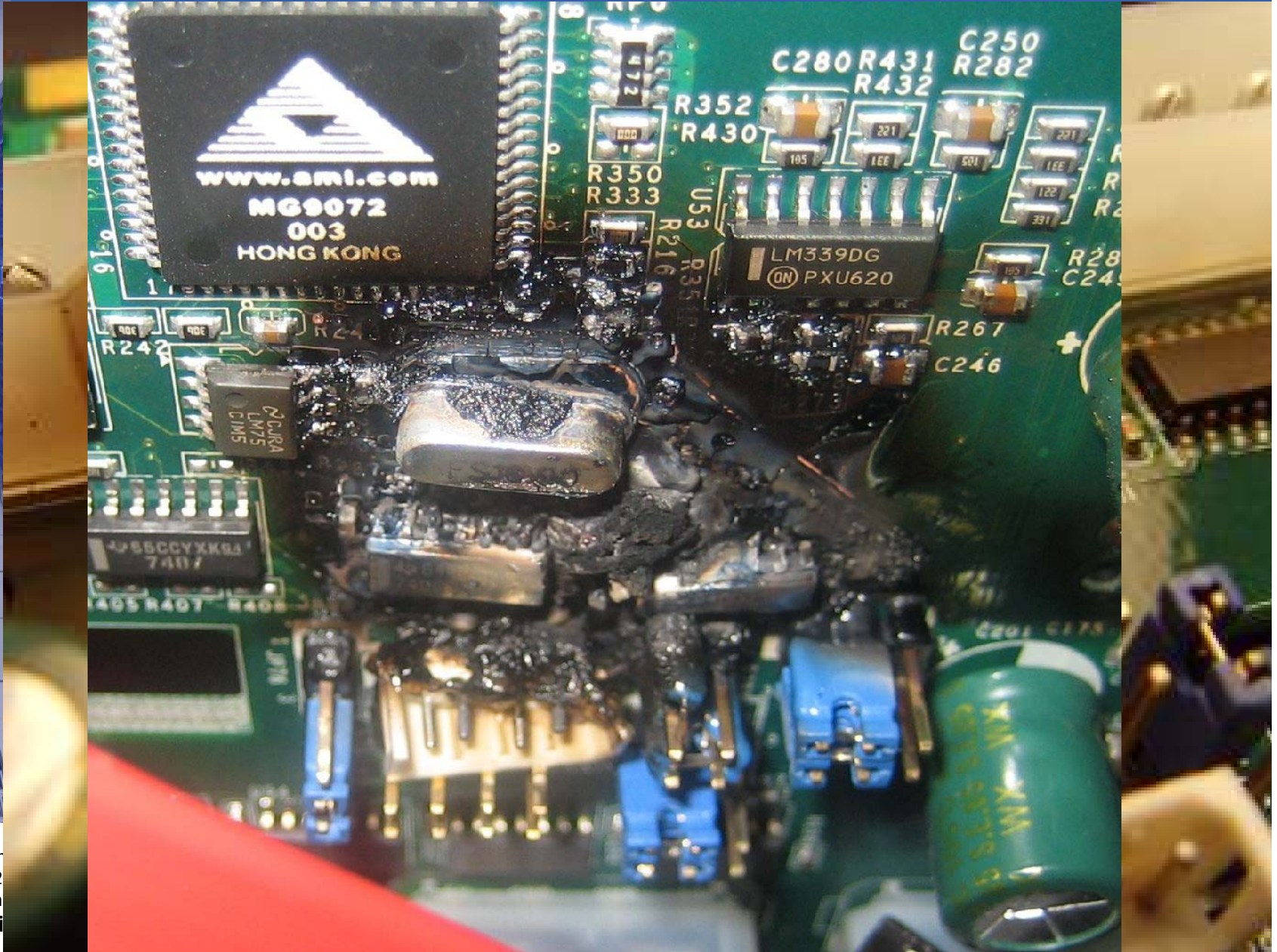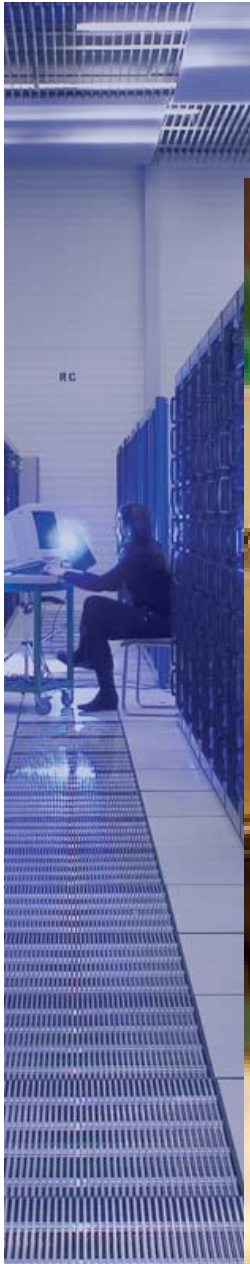
- **IPMI is good...**
  - **... and CERN is exploiting it well**
    - Why on earth do you need to be in the Machine Room?

- **Monitoring is becoming (serious) automation**
  - **And, again, CERN is well placed**
    - Who needs people in the machine room?
    - But, as usual (?) we undersell ourselves.