

# Evaluation of ATCA/ $\mu$ TCA

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# ATCA Developments

- Who is doing what? Based (solely) on RT07:
  - Alexander Mann, TU Munchen Physik-Department E18
    - Sampling ADC
    - Mezzanine boards on custom carrier
      - Mezzanine power developed on front-board
        - » Lower noise for analog circuitry
    - GbE base, RocketIO fabric
  - M. Haney, UIUC
    - ATCA carrier for (single) 6U-VME slave
    - GbE base (only)
    - Zone 3 for VME P2 user I/O
    - IPMC based on microcontroller(s)

# Who is doing what?

- Stefan Simrock, Tomasz Jezynski, Deutsches Elektronen-Synchrotron
  - LLRF System Conversion to ATCA
  - AMCs on custom carrier
  - Analog and clock on full-mesh fabric
- Wolfgang Kühn, Justus Liebig University Giessen II. Physikalisches Institut
  - FPGA-Based Compute Nodes for the PANDA
  - Linux on embedded PPC's
  - IPMC as CPLD
  - FPGA config downloaded by GbE (base), but selected by IPMC
- Manfred Wendt, Fermi National Accelerator Laboratory
  - Digitizer
  - GbE base and fabric, using Stratix/NIOS FPGA
  - IPMC in same FPGA

# Should we keep a list?

- To share ideas, solutions
- What?
  - What are the “unit vectors” which span ATCA design space?
- Where?
  - ILC Agenda Server?
    - Easy to use, but this list is not an “event”
  - ILC EDMS?
    - Is anyone using this yet?
  - ILC Doc Server??
    - Seems oriented toward final product(s), not work in progress

# ATCA-P?

- We got there with VME...
  - Physics-specific standard
- Can/should we do “the same” with ATCA?
  - And if not a standard, then perhaps something else, to specify how things should be done...

# The Scope Alliance

- [www.scope-alliance.org](http://www.scope-alliance.org)
  - Ecosystem initiative
    - Focus on network equipment providers (NEPs)
  - “to accelerate deployment of ...”
  - “... carrier-grade base platforms...”
    - High availability
    - Environmental standards (central office) compliance
    - Extended life cycle
  - ... based on COTS+FOSS
    - Commercial off the shelf
    - Free and open source software

# Profiles, and Gap Analysis

## – Profiles

- Subset of existing specifications
  - to identify commonalities, choices
- Down-selection of options
  - So multiple vendors can interoperate

## – Gap analysis

- To identify problems with existing specs
  - Potential fragmentation in the supplier market
- And to recommend solutions
  - So vendors can make consistent choices

# Available today

- ATCA Profile v1.0
- Linux Profile V1.2
- Middleware Profile v1.0
- AMC Port Map Gap Analysis V1.0



# ATCA Profile v1.0

- Examples of issues:
  - AMC interconnect and fabric
  - Blade thermal requirements; RTM thermal reqs
  - Cable management
  - EMC compliance
  - Inter-shelf connections
  - Fabric (dual star, GbE (not PCIExpress))
  - IPMB redundancy
  - Noise (acoustic)
  - Power budget; power supplies
  - Shelf cooling
  - Shelf Management, HW and modular software

# Implications for Physics (and ILC)

- We could develop an ATCA-for-Physics profile
  - With or without the Scope Alliance
    - Membership is \$1k to \$10k...
- But we need to determine what is important (unit vectors, spanning set)
  - And what choices we should not make
    - E.g. excluding PCI Express from the fabric
- And we need a “venue” that extends beyond the ILC

# Discussion?