



*The government seeks individual input; attendees/participants may provide individual advice only.*

**Middleware and Grid Interagency Coordination (MAGIC) Meeting Minutes**

October 5, 2022, 12-2 pm ET

Virtual

**Participants**

|                      |                          |
|----------------------|--------------------------|
| Alan Sill            | Keith Beattie (LBL)      |
| Arjun Shankar (ORNL) | Mallory Hinks (NCO)      |
| Hal Finkel (DOE/SC)  | Marcy Collinson (Oracle) |
| Jay Park (NSF/OAC)   | Rich Carlson (DOE/SC)    |

**Introductions:** This meeting was chaired by Rich Carlson (DOE/SC) and Jay Park (NSF)

**Planning Discussion:**

- Mallory pulled up the notes Jeff took at the previous meeting.
- The group discussed the topics of AI/Deep Learning/ML, Multitenancy, Cybersecurity, Decarbonizing Scientific Computing, Programming Models, AI for the Edge, Troubleshooting Challenges, and Supercomputing IWG and came up with the following plan:
  - Multitenancy 4-5 months
    - 1 month on multitenancy at node level, site level, distributed level (3 speakers)
      - What does multitenancy mean at each level?
      - What are the hardware issues?
      - Security models? - are we doing an adequate job?
      - Performance concerns?
      - Singularity – containers and virtual machines
    - 1 month on Resiliency – different techniques?
      - Resilience for observation data workloads
      - Extreme scale systems
    - 1 month from Cloud Providers
      - Oracle
      - Facebook
      - AWS
    - 1 month from HPC and High-throughput providers (Miron and Alan Sill)
      - TACC (Texas Advanced Computing Center), LCFs
      - What are HPC communities thinking?
    - 1 month from Science Community and workload pattern
      - How are they going to use this? Impact on science?
    - 1 month on Future Architectures
      - What the new architectures are going to drive us towards? As we get more accelerators and specialized hardware.
      - Disaggregating computing – how that impacts multitenancy – **John Shalf – LBL**

- Other architectures?
  - Questions for everyone
    - Could leave nodes under-capacity
    - Code only using half of cores
    - GPU allocation separately – security and compliance aspect – can't fracture nodes
    - Capacity sharing
    - Cybersecurity issues
    - Cost models
- Cybersecurity – current status – Jim Basney (identity management) – Von Welch (identity management) – 1 month
  - What are the networks doing on cybersecurity on an operational basis? – JET
  - Anything changing?
  - Center for trustworthy cyberinfrastructure
- Decarbonizing Scientific Computing – Alan Sill – collocating – multi month
  - Community issues associated with multitenancy
  - Edge model helpful? – Marcy
  - Ask mailing list for suggestions
- AI/Deep Learning/ML – What are we doing that's different that AI IWG? 1 month - Coordinated meeting with AI IWG? – Ask Faisal? Are there things we should be discussing at MAGIC? Status? What input do they need from the MAGIC community? – Plan new topics after that discussion.
  - Healthcare AI, Cloud Bursting – Marci, Oracle
  - Talks on different domains, bio vs material science
  - Researchers
  - How are facilities finding it useful
  - Self-driving labs – AI
  - Oracle – AI subdomain – take to internal AI – talk to specialty teams – OCI
  - AI assisted programming code whisperer
  - Debugging, performance tuning
  - Interplay between HPC and AI accelerators – best practices
  - AI ethics – research
  - Neuroscience and ethical hacking
  - AI and Data Bias
  - AI systems working, when does it become more than a janitor
  - AI as a service?
  - AI interpretability ethics?
    - How do you share your models?
  - AI as part of a bigger model it feeds into
  - Workflows – different types that include AI and ml
- Programming Models
  - Community developed portability layers C++, modern features, etc.
  - Accelerate parallelism in software
  - DSL?

- Interfacing part of languages, ex. Python
- Compiler issues – embedded DSLs – build into existing programming language
- Fuzz Testing, compiler assisted tooling
- Supporting a heterogeneous environment is hard to support
- Seeing things from a commercial perspective – Oracle – small demo on project they are working on
- Data parameters across international boundaries
- Integrated development systems – IDEs (VS Code)
- Have these new code modules changes Requirements – workflow programming models
- Digital assets, computational steps – reproducibility
- AI for the Edge instruments
  - Roll up into AI discussion
- Troubleshooting challenges
  - Might fit in with the programming models
- Supercomputing IWG

**Roundtable**

**Next Meeting**

November 15 at SC22