



MAGIC Meeting Minutes

September 3, 2014

Attendees

Gabrielle Allen	U of Illinois
Rich Carlson	DOE
Dan Gunter	Berkeley Labs
Dan Katz	NSF
Bryan Lyles	NSF
Grant Miller	NCO
Alan Sill	TTU/TACC

Action Items

1. MAGIC members are requested to organize/chair a MAGIC session in which they have an interest and expertise. Contact Rich Carlson (Richard.carlson@science.doe.gov), Dan Katz (dkatz@nsf.gov) and/or Grant Miller (miller@nitrd.gov).
2. MAGIC members should look for ways to increase participation by Federal agency staff, PIs and industrial groups working in this focus area.

Proceedings

This MAGIC Meeting was chaired by Rich Carlson of DOE and Dan Katz of the NSF... The primary objective of the meeting was to identify focus topics for MAGIC to pursue during FY15.

Rich Carlson provided an initial suggestion for tasking for MAGIC during FY15. MAGIC addresses middleware and Grid technologies that enable distributed computational environments, infrastructure, and services. MAGIC meetings should address where we are now and where these technologies and services are going. Individual researchers should be identified who can focus on key aspects of this topic and who can organize and lead discussion sessions to identify issues the Federal agencies should address in these areas.

Theme: Take an in-depth look at how distributed computing will evolve over the next 5 – 10 years. Some specific issues are:

- 1) Multi-core processors requiring codes become more parallel
- 2) Memory to flop ratios changing
- 3) I/O rates not keeping up with either parallel processing or core network speeds
- 4) Emerging experimental / observational science communities
- 5) Instruments and detectors generating more data
- 6) Integrating knowledge bases into Distributed Computing infrastructures
- 7) Visualization and analysis services for multiple and/or remote users
- 8) Container and virtualization technologies

Discussion among the MAGIC members covered a number of topics like::

- There is an increasing gap between best practices in the commercial sector and in the scientific sector. There are significant differences between what the commercial

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sector is developing and deploying and what the Federal agencies, particularly DOE/SC and NSF, are funding, e.g., Google is developing cluster scheduling algorithms, resource discovery, and the beginnings of work flow tools. We need to bridge the gap so science applications can take advantage of the commercially developed capabilities.

- Industry ignores much of what the Federal research has provided such as compute engines, scheduling, legal frameworks, and automated machine readable service agreements. Science cloud environments are often constrained in ways that make it difficult for industry to exploit the science cloud capabilities.
- We need to increase industry participation in MAGIC for, by example, discussing science virtual environments and distributed resource management at conferences and workshops.
- The science community needs to adopt tools of virtualized environments such as Docker scheduling in Grids, Infiniband libraries for Docker, Linux groups and Google libraries for virtualization technologies, and lightweight virtualization containers for scheduling and processing in multi-core processors
- Alan Sill has requested a BOF at SC14 to discuss Identity Management for SDN environments. This could provide a vehicle for initiating a discussion between the commercial community and the science community
- We should invite the 2 NSF cloud projects to present to MAGIC to get their views on what research is needed and how we can more fully engage the commercial sector.
- Bryan Lyles is holding an Oct 1 workshop with the Grid and GENI communities to discuss Identity, Authorization, resource discovery, and resource description.
- Our theme should be to look at how distributed computing and cloud environments will evolve.
- We should look at hardware as well as software
- We should involve the university research community to identify how the university resource community is responding to provide distributed environments and data storage and use to their researchers
- Existing virtual environments should be asked to organize sessions for MAGIC: OGF, OSG, GENI, FutureGrid. Tim Bell might be a possible organizer. Internet2 could organize a session on their Net+ environment.
- We need to address how SDN might affect distributed infrastructure, storage, and virtualization environments.

MAGIC Focus Topic for FY15

This discussion provided a consensus that the MAGIC focus for FY15 should be on distributed computing evolution. The topics for discussion should include:

- 1) Virtualization technologies
- 2) Multi-core processors requiring codes become more parallel
- 3) Memory to flop ratios changing
- 4) I/O rates not keeping up with either parallel processing or core network speeds
- 5) Emerging experimental / observational science communities
- 6) Instruments and detectors generating more data
- 7) Integrating knowledge bases into Distributed Computing infrastructures
- 8) Visualization and analysis services for multiple and/or remote users

MAGIC should identify conveners to organize MAGIC discussion sessions and MAGIC members are requested to volunteer to organize/chair a session in which they have an interest and expertise.

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Topics of interest that include:

- Existing/developing virtual environments: OSG, OGF, GENI, FutureGrid, Internet2 Net+ environment
- Convene the OSG, CERN, OGF... communities to discuss their different approaches and what has worked/what has not worked.
- Engage commercial providers to discuss their existing/developing capabilities that can be applied to research communities and to inform them of science environment capabilities
- Bring the NSF funded cloud environments into the MAGIC discussions to represent academic community interests
- University community researchers and providers to identify what capabilities they have and what additional capabilities they will need.
- SDN developers to identify how their developing technology might impact virtual environments and distributed resources/distributed processing
- Multi-core processing and its implications for research communities
- Memory to flops ratios are changing. How will this affect research communities?

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Upcoming Meetings:

September 15-19, NY University, CANS: Chinese American Symposium
November, SC14, New Orleans: WISPE meeting focused on software

Next MAGIC Meetings:

October 1, 2014, 2:00-4:00 EDT, NSF
November 5, 2014, 2:00-4:00 EDT, NSF