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**Middleware and Grid Interagency Coordination (MAGIC) Meeting Minutes<sup>1</sup>**  
March 3, 2020, 12-2 pm ET

Virtual

**Participants**

Alison Derbenwick Miller (Oracle)	Keith Beattie (LBL)
Alan Sill (TTU and OGF)	Lavanya Ramakrishnan (LBL)
Alan Unell (Aero)	Lisa Arafune (Coalition for Academic Scientific Computation)
Dan Fay (Microsoft)	Mallory Hinks (NCO)
Dan Gunter (LBL)	Michael Corn (UCSD)
Dan Taylor (Internet2)	Misha Ahmadian (TTU)
David Martin (ANL)	Rich Carlson (DOE)
Deep Medhi (NSF)	Saswata Hier-Majumder (DOE)
Eric Lancon (BNL)	Sharron Broude Geva (University of Michigan)
Katherine Evans (ORNL)	Steve Petruzza (Utah)
Glenn Lockwood (LBL)	Tevfik Kosar (NSF)
Hakizumwami Birali Runesha (U of Chicago)	Tom Brown (TTUM)
Jack Wells (nvidia)	

**Introductions:** This meeting was chaired by Richard Carlson (DOE/SC) and Tevfik Kosar (NSF). Rich welcomed the group.

*Cloud Speaker Series*

Guest Speakers:

- Dr. Alan Sill, Managing Director, High Performance Computing Center at TTU; Co-Director, NSF Cloud and Autonomic Computing Center
- Dan Taylor, Director, Internet2

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<sup>1</sup> Any opinions, findings, conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the Networking and Information Technology Research and Development Program.

## Dr. Alan Sill, TTU

### *Comments on Return on Investment for Academic Research Computing and Data Support*

#### ROI in Research Computing and Data Delivery Settings

- Research computing and data resources as cost centers vs profit/productivity centers – research indicates that in most cases, the latter is more accurate.
- ROI Simplified
  - Determine and measure what you value
  - Characterize and quantify your investments
  - ROI is the ratio of your return to what you invest
- Definition of “Return”
- Definition of “Investment”
- Comparing ROI for different approaches
  - Both financial and non-financial aspects of ROI need to be considered
  - Most organizations that take this effort find a positive ROI
- CASC ROI Surveys 2019/2020
  - Only 25-30% of institutions reported ROI to upper administration on a regular basis
  - Small fraction of institutions have explored cloud for large-scale usage
  - More conclusions in slides
- Open Science Grid – March 2021
  - Alan has seen a 10:1 return on investment
- EGI-ACE Project and Transition to EOSC
- European Open Science Cloud

#### NSF CAC Project: Data Center Control For Renewable Energy Applications

- Gave overview of the project
- GLEAMM Microgrid Test Facility

#### Q&A

- Jack Wells (nvidia) – When I’ve asked colleagues in Europe for the energy consumed by the European Science Grid or the worldwide LHC computing grid, they haven’t had an answer. Do you know if there’s any attempts in a grid setting to measure electricity consumed or energy efficiency?
  - Alan – For several years now, European funding agencies have required that you include energy costs and optimize energy efficiency in every supercomputer bid. So you may not be talking to the right people at those organizations.
  - Jack – Is there a published report about how much the worldwide LHC computing grid consumes in electricity or any other organized grid?
  - Alan – I can’t think of one off the top of my head, but I think it’s fairly easy to assess the power. Everybody who runs a facility knows how much power they use.
- Saswata Hier-Majumder (DOE) – From my perspective, I can think of software as having 2 types. One in the application development area and the other that are tools that are necessary. I was wondering if you or your colleagues have done any studies on ROI in these two different categories of software.

- Alan – I’m aware of a lot of work in the area of sustainability. But the area of software sustainability has the problem that the same word, “sustainability”, means many things to many people. In terms of ROI, it’s coupled with this topic. How do you create communities that will keep a piece of software going. That can be very different from a funding agency point of view.

## **Dan Taylor, Internet2**

### *Internet2 Update and Cloud Programs Overview – How Research and Education Adopt the Cloud*

- Internet2 Historic Context
  - Formed in 1996
- Internet2 Infrastructure for Research
- Internet2 Exists to Facilitate collaborative effort of US higher education institutions to design and provide selected mission-critical services required to advance all aspects of their academic and service missions.
- Internet2 works by engaging mutual-interest collaboration across diverse communities
- 100G Nationwide Network – A Secure, Stable, and Trusted Network for R&E
- Internet2 Network and Next Generation Infrastructure (NGI)
  - Able to collaborate globally
  - Capacity to cross the oceans
- InCommon services and Software
  - Single sign on platform with 1000 members
- Next Generation Infrastructure 2021
  - Cyberinfrastructure, Software, automation, and Virtualization – The future of High-performance R&E Across the Globe
  - Should be complete by 3<sup>rd</sup> or 4<sup>th</sup> quarter
- Getting to the Cloud
- Leveraging R&E Networks for Direct Cloud Connections

### Q&A

- Alan Sill (TTU) – I know that Internet2 has been deeply involved in training people to interact with the various cloud vendors. Do you have any comments on how that’s been going in terms of participation?
  - Dan – We’ve focused on meeting the needs of the institutions to get more people familiar with using various tools on various different cloud providers. Internet2 website has a whole schedule of trainings that are available to the community.
- Tevfik – Has there been any effort to optimize and reduce the power consumption at Internet2 sites?
  - Yes. The new optical equipment and the routers are (I think) 1/5 the power consumption of the old stuff. And you’re using that reduced amount of energy to move greater bandwidth.
- Dan Gunter (LBL) – Do you get involved at all in helping people figure out some of the cost issues between moving data to the cloud or serving it from some sort of onsite systems?

- We've been working with NIH on how to reduce egress costs and things like that. And certainly the move to the high speed access tools such as direct connect express route come with a reduced cost for egress.

### **Roundtable**

- Sharon Geva – Wanted to pitch the survey that Alan mentioned. Invite anyone who is at an academic center, research center, or national lab, or a university to participate. Mallory will send out the link.

### **Announcements/Action Items**

- Tefvik reminded everyone that if you would like any specific topics to discuss in future meetings, to let himself, Rich, and Mallory know.

### **Next Meeting**

April 8 (12 p.m. ET)