

# Intelligent Data Movement Service

## *Shakedown Experiments*

Ezra Kissel, Amey Jahagirdar  
Indiana University

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# Project overview

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- Create a distributed, dynamic data storage and movement service as a long-running GENI experiment
- Distributed across many GENI aggregates, dynamism through responsiveness to network measurements
- Use existing, proven services as core components
  - Object store (IBP server)
  - WAN acceleration (Phoebus)
  - Network signaling (XSPd)
  - UNIS and I&M
  - Data Manager Service (new)
- Explore the limits of GENI resource allocation capabilities

# GEC19 status

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- Appliance images for both InstaGENI and ExoGENI
  - Object store and WAN acceleration
  - More to come
- Service discovery and automatic placement in resource pool
- Instrumentation of experiment using GEMINI components
  - BLiPP, global UNIS
  - Monitoring dashboard
- Prototype Data Manager Service (DMS)
  - Heuristics for data distribution based on measurements and known topology
  - Actively move data and prioritize under-utilized storage resources
- Existing client tools can be used to move data in/out of experiment

# GENI resources and tools

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- InstaGENI and ExoGENI VMs
  - Experiments across multiple aggregates, currently at 10-15 nodes
  - Simply adding more nodes is easy, doing so intelligently is harder
- LAN and stitched links, but also "sliver islands"
  - DMS does topology lookup in UNIS to determine when to use dataplane or control interfaces as necessary
- GENI I&M components
- Omni and Flack
- In-progress: ProtoGENI backbone nodes, multi-point stitching

# Challenges faced

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- **Aggregates can be inconsistent**
  - Control interface port filtering
  - VM clock skew
  - Slice/sliver expiration time mismatch, get consistent notifications?
- **Differences between EG and IG**
  - Need a tutorial/HOWTO to help newcomers get running quickly using a experiment containing resources from both aggregate types?
- **Common image creation**
  - Completing and perfecting this process would be a great help
- **Stitching capabilities are limited – bound to improve soon**
- **Tracking and using allocated resources programmatically**

# Not all challenges...

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- Tutorials are well-written and a quick way to get started
  - Some are broken, outdated specs, etc.
- [help@geni.net](mailto:help@geni.net) and IRC channel very helpful
- Basic resources have much improved stability overall
  - Tools have come a long way

# End

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- Contact:
  - [ezkissel@indiana.edu](mailto:ezkissel@indiana.edu)
  - [ajahagir@indiana.edu](mailto:ajahagir@indiana.edu)
- Project Wiki Page
  - <http://groups.geni.net/geni/wiki/sol4/IDMS>
- Thanks to our colleagues at UTK and ACCRE for their use and support of the IBP components in IDMS
- Thanks to the GPO and the entire GENI community