Multi-tier Assistance, Training, and Computational Help (MATCH)

- Goal for NSF: To provide democratized and equitable access to NSF’s advanced cyberinfrastructure ecosystem

- MATCH Theme: providing equitable, scalable support to best enable research on NSF funded cyberinfrastructure

https://amp.ci/

Stampede2 at the Texas Advanced Computing Center. From xsede.org
MATCH Services

TIER 4 MATCH-Premier
LONG-TERM EMBEDDED SPECIALISTS

TIER 3 MATCH-Plus
SHORT-TERM SUPPORT PARTNERSHIPS

TIER 2 Curated Knowledge Base
COMMUNITY EXPERTS

TIER 1 Easy to Use Tools
ACCESS ONDEMAND AND PEGASUS

https://amp.ci/
Tier 1 – Pegasus and Open OnDemand

- **Pegasus**
  - Workflow manager
    - Input data -> Compute Job -> Output data
    - Complex data workflows
    - Reproducible
    - Provenance, ensures data integrity

- **Open OnDemand**
  - Improve user experience with easy-to-use interface to access complex cyberinfrastructure
  - Templates to run jobs, transfer data, etc

---

Jobs

```
<table>
<thead>
<tr>
<th>Created</th>
<th>Name</th>
<th>ID</th>
<th>Cluster</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>September 2, 2021</td>
<td>test_job_from_path</td>
<td>8372055</td>
<td>Summit</td>
<td>Completed</td>
</tr>
</tbody>
</table>
```

https://amp.ci/
**Tier 1 – MATCH Approach**

- Integrate Pegasus and OnDemand platforms with the ACCESS MATCH Portal
  - Connect.CI ([https://Cnct.CI](https://Cnct.CI)) underpinnings
    - Northeast Cyberteam, 6 Cyberteams and Campus Champions
    - Support all tiers
  - Provide ACCESS wide tools with full integration
  - Support Resource Providers

In MATCH use Pegasus to automate user workloads, use as is + integrate with AMP and OOD

[https://amp.ci/](https://amp.ci/)
Tier 2 – Knowledge Base

- Problem/Need
  - Support for allocations for NSF CI
  - New documentation/tutorials needed
    - Gaps, many disparate resources
  - So many resources – which is best for the users?

- MATCH Approach
  - Leverage experience with allocation request process
  - Create affinity groups
  - Resource existing trainings and documentation
  - Define gaps and create new materials
  - Community grants

https://amp.ci/
MATCH Computational Science Support Network (CSSN)

- The CSSN is about coordinating the community around providing resources to support users using large ACCESS systems
- Recruitment to support trainings, documentation, responding to discussion forum questions, and general issues
- Financial incentives, travel grants
Tier 3 – MATCH Plus

- Problem/Need
  - Users often need short-term assistance transitioning to a new resource (e.g., local cluster to ACCESS resource), or removing a roadblock (e.g., replacing a stage in a workflow to better performance/scale)

- MATCH Approach
  - Follow the cyberteam model, matching each project with a student and an experienced mentor for a ~6 month engagement
  - Build on experience managing complex collaborative projects with distributed teams
  - Facilitate regular touch points

https://amp.ci/
Tier 4 – MATCH Premier

- Extensive collaborative engagements
  - Optimize applications
  - Improve workflows
  - Parallelize codes
  - Other extended projects where a longer term, consultative resources (expert) is needed

- MATCH Approach
  - Researchers request support six months in advance
  - Consultants recruited from CSSN (facilitated by AMP Tag Taxonomy)
  - Researchers fund consultants out of grant funds or supplements
  - Consultants meet monthly, initially with Tier 3 teams until we have critical mass, to exchange project information and share best practices, war stories

https://amp.ci/
Why Is This Significant?

- Moving into the next phase of supporting cyberinfrastructure
- Serving all groups with equitable and scalable support
  - “Traditional” High Performance Computing workflows
  - High Throughput Computing workflows
  - Underrepresented groups
- Creating connection points across the community to best support and enable cutting edge research nationally
Thank you!

- James Griffioen, Vikram Gazula, University of Kentucky
- Ewa Deelman, Mats Rynge, University of Southern California
- David Hudak, Alan Chalker, Ohio Supercomputer Center
- John Goodhue, Julie Ma, Massachusetts Green High Performance Computing Center (MGHPCC)

knuths@Colorado.edu
MATCH
Multi-tier Assistance, Training & Computational Help

Let’s go!

https://amp.ci/