



Affinity Group Annual Report

Next Generation Data Center (Next Gen DC)

Reporting Period:

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Group Goals

The **Next Generation Data Center (Next Gen DC)** affinity group brings together research cyberinfrastructure and data center operations professionals to:

- Build a community focused on sharing expertise and best practices in data center design and operations.
- Exchange knowledge on emerging technologies that impact data center planning, management, and sustainability.
- Support members in preparing for the next wave of research computing needs through collaboration with industry and peer institutions.

Topics of Interest:

- Direct liquid cooling best practices
- Considerations for power-dense hardware needs
- Designing for flexibility to adapt to large system installations
- Experiences retrofitting existing data centers for modern power and cooling needs
- Providing services to different regulated computing environments (HIPPA, CMMC, etc)
- Modular data centers
- Shared access
- Tiers of service
- People's skill sets to operate a liquid-cooled facility vs. air-cooled

Group Members

- Brad Battey, University of Michigan
- Brock Palen, University of Michigan
- David Hancock, Indiana University
- Eric Bellmore, Grand Valley State University
- Esen Gokpinar Shelton, Indiana University
- Graham Allan, University of Minnesota
- Laura Pettit, Indiana University
- Todd Shechter, University of Wisconsin-Madison
- Winona Snapp-Childs, Indiana University

Major Activities (FY25)

A key activity during this reporting period was the **Next Generation Data Center Workshop**, held February 25–26, 2025.

This two-day, executive-briefing–style event convened professionals from universities of varying sizes and leading industry partners including Dell, Intel, Nvidia, AMD, and Hewlett-Packard.

Participants:

- Learned from industry representatives about trends in power, cooling, and sustainability.
- Exchanged institutional experiences and future planning strategies.
- Engaged in panels and breakouts designed to address practical challenges in data center operations and design.

Significant Results

The workshop received highly positive feedback:

- **75.7%** of attendees rated their experience as *Excellent (5)*, and **24.3%** as *Very Good (4)*.
- Participants reported leaving with a clearer understanding of evolving data center requirements and design priorities for their institutions.

Most Valued Sessions:

- *Cooling, Power, and Data Centers* (Dell presentation) (n=31), praised for actionable insights on liquid cooling, power density, and sustainability. These topics are found to be directly relevant to attendees' data center planning.
- *Panels on Sustainability & Power Density* (n=24) and *Facility Operations & Capacity Planning* (n=22), valued for practical relevance to managing high rack densities and optimizing energy use.
- *RIF Projects & Vendor Sessions, Modular Data Centers* (n=21), and *Storytelling Breakouts* (n=17), highlighted for fostering collaboration and applied learning.
- *Networking at The Rathskeller* (n=24), recognized as a meaningful venue for community connection.

Products and Insights

While no formal products were produced out of the workshop this year, the group gathered valuable data from workshop surveys:

- **Key Challenges:** Increasing power density and cooling needs, with liquid cooling and OCP (Open Compute Project) emerging as viable solutions.
- **Shared Obstacles:** Institutions continue to face common issues around funding, space, and infrastructure scalability.
- **Emerging Themes:** AI workloads are driving significant changes in data center design and management.
- **Community Value:** Attendees emphasized the importance of collaboration and peer exchange to address shared operational challenges.

Planned Activities (FY26)

The affinity group will continue to strengthen its community and knowledge-sharing efforts through additional workshops and collaborative discussions. Potential focus areas include:

- **Case Study Exchanges:** Real-world examples of retrofits, high-power-density upgrades, and infrastructure migrations, including costs and challenges.
- **Workforce Development:** Addressing staffing models, skill gaps, and recruitment for evolving data center environments.
- **Technology and Vendor Insights:** Cross-compatibility discussions, monitoring software comparisons, and post-adoption technology outcomes.
- **Collaboration with Power Utilities:** Exploring partnerships to expand energy capacity and sustainability strategies.