



Case Study: NERSC

Top Supercomputing Center Enables Globus Online for Thousands of Users



Seeking to provide its researchers with more effective web-based tools, the National Energy Research Scientific Computing Center (NERSC) adopts Globus Online as a recommended method for secure, reliable file transfer.

Top Features Cited

- **Fire-and-forget usage** – no complicated tools for users to learn
- **Automated performance tuning** – no need to constantly tweak the system
- **Secure enablement** – no need to implement new security processes or systems
- **Automated authentication for existing users**, with pre-create account options coming soon
- **GUI or CLI-based options** – to meet needs and preferences of different users
- **Hosted service** – no software installs or custom IT infrastructure required
- **Backed by expert support team** – low-touch system for NERSC staff

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–David Skinner, Software Group Leader, NERSC

Challenge: Meeting the Demand for Web-Based Computing Services

With over 4000 users and hundreds of ongoing projects, NERSC (the National Energy Research Scientific Computing Center) at Lawrence Berkeley National Laboratory is a hotbed of computational science. The facility is known as one of the best-run scientific computing centers on the planet, stating that “what distinguishes NERSC is its success in creating an environment that makes HPC resources effective for scientific research.”

But what was effective for one generation can be cumbersome for the next – and in the postmodern research arena, a “generation” of computational scientists can span months, not years.

For example, the method of accessing data by logging into a terminal and entering commands via a command line interface (CLI) is “in many respects going the way of the punch card where some of our scientists are concerned,” says David Skinner, NERSC Software Group Leader.



NERSC's Hopper is the fifth most powerful supercomputer in existence.

“Nowadays people go to the web for everything,” observes Skinner, “and our users are looking to us to evaluate, recommend and provide access to reliable, secure services via the web. That’s what led us to Globus Online.”

Solution: Enable Globus Online for All NERSC Users

Globus Toolkit users at NERSC pointed Skinner to Globus Online, a fast and reliable transfer service which they had already discovered and used with success.

“It just makes sense to enable Globus Online for our users,” says Skinner. “Our scientists are familiar with tools like scp and GridFTP, but with Globus Online we can offer a much simpler and faster method for moving data. Globus Online actually makes web-based data syncing an easy, nearly trivial process, so you don’t have to be an IT or middleware expert to move your files.”

“Globus Online is just what our scientists have been looking for.”

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Therefore, like other top computing facilities, NERSC is working to make its data and computing services available online.

“I moved 400 GB of files and didn’t even have to think about it.”

–Jeff Porter, NERSC user from Brookhaven National Lab

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Enabling Globus Online for Researchers

Simple Enablement and Usage

To get Globus Online enabled for their users, NERSC followed these simple steps:

- 1. Registration and Selection:** A NERSC administrator signed up to explore the service, then contacted Globus Online to discuss becoming an enabled facility.
- 2. Endpoint Activation:** NERSC validated their chosen “endpoints” (locations to/from which researchers need to be able to transfer files).
- 3. Authorization and Promotion:** NERSC pointed users to <http://www.nersc.gov/nusers/services/data/transfer/> to promote the service and provide a link to sign up.

“[Our scientists] don’t have to worry about whether files can get where they need to go, or wonder about the best way to tune the system. It just works.”

--Shreyas Cholia, HPC Engineer, NERSC

It’s as simple as that. Now NERSC users can create their own accounts -- signing in with existing NERSC IDs, and easily move files without worrying about whether transfers will complete. NERSC is also working with Globus Online to pre-create accounts for new users.

Drag-and-Drop Archiving

NERSC scientists can also use Globus Online for “drag and drop archiving” to move data between its long-time archival storage and compute systems using a visual interface – an “incredibly useful feature” that makes it much easier to back up or restore relevant data.

Adding Local Endpoints

Globus Online’s ‘Globus Connect’ feature solves the “last mile problem” of file transfer, allowing users to add local machines as transfer endpoints. With Globus Connect, users can securely move files between NERSC and their campus servers, desktop or laptop, even if it is behind a firewall.

Results: Benefits for NERSC Users and Staff

- Ease of use:** There’s no need to train users in complicated techniques – with Globus Online, as Skinner says, “users can just pick it up and run with it.”
- Optimized performance:** Globus Online automatically tunes the system and fixes optimal settings for each transfer. As Skinner says, “we expect better performance with fewer people involved in configuring and making sure performance actually happens.”
- Time and effort saved:** Globus Online’s simplicity and task automation means NERSC scientists and IT staff won’t have to spend time learning and tweaking the system – with this complexity removed, life is easier for both IT administrators and their scientist end users.
- Flexibility gained:** Since users can move files to/from any NERSC endpoint, from any location, they can perform their work from virtually anywhere.

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--David Skinner, Software Group Leader, NERSC

“It’s like banking online,” says Skinner. “There was a period where people stuck with the traditional paper-based way... but now most people have made the transition and are glad they did. As the collection of Globus Online endpoints grows, our users will be using the highest performing WAN-tuned systems with utter simplicity.”

Skinner points out that NERSC is a relatively new Globus Online user, but is quick to add that “our experiences have been excellent from the beginning. The Globus Online service seems

to be just what our scientists have been looking for.”

NERSC Usage Metrics:

- Globus Online moved 100,000 files totaling 98 TB from Argonne to NERSC and another facility in a couple of days, with no human involvement.
- Comment from NERSC user: *“Fantastic! I have already started using the globus connect to transfer data, and it only took me 5 minutes to setup. Thank you!”*
- Comment from NERSC user: *“I routinely have to move hundreds of gigabytes of files – Globus Online makes it easy, so I can execute these transfers with very little effort.”*

“Our users require a high performance data transfer solution that is both reliable and secure. To have found such a system that is also amazingly easy to use is a fantastic bonus – it means our scientists can now reliably move large datasets with the push of a button. They don’t have to worry about whether files can get where they need to go, or wonder about the best way to tune the system. It just works.”

--Shreyas Cholia, HPC Engineer, NERSC

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