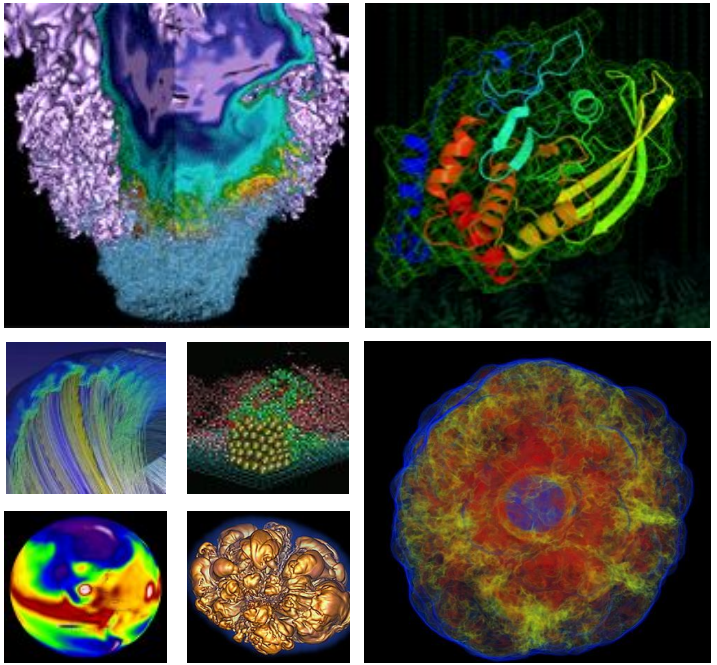
Crayport to HPE DCE Migration:

Bidirectional Incident Management for ServiceNow and HPE DCE



John Gann, Daniel Gens

Cray User Group, May 2022

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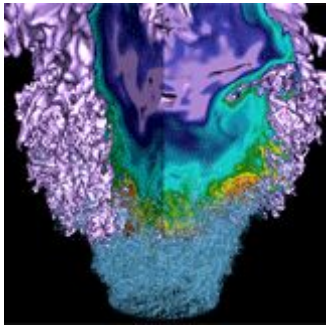
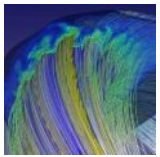
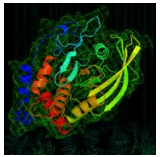
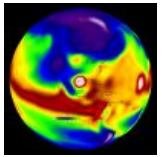
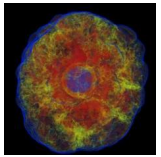
NERSC <> Crayport Integration

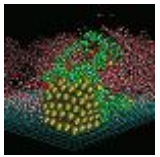












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Overview

- ServiceNow: NERSC internal ITSM system + User Helpdesk
- Communication with Cray by email or phone:
  - Delays, errors, manual data entry, increased MTTR
- Constant interactions between NERSC and Cray engineers

1,670 cases opened

6,098 case updates synced

~640 engineer hours saved

Benefits

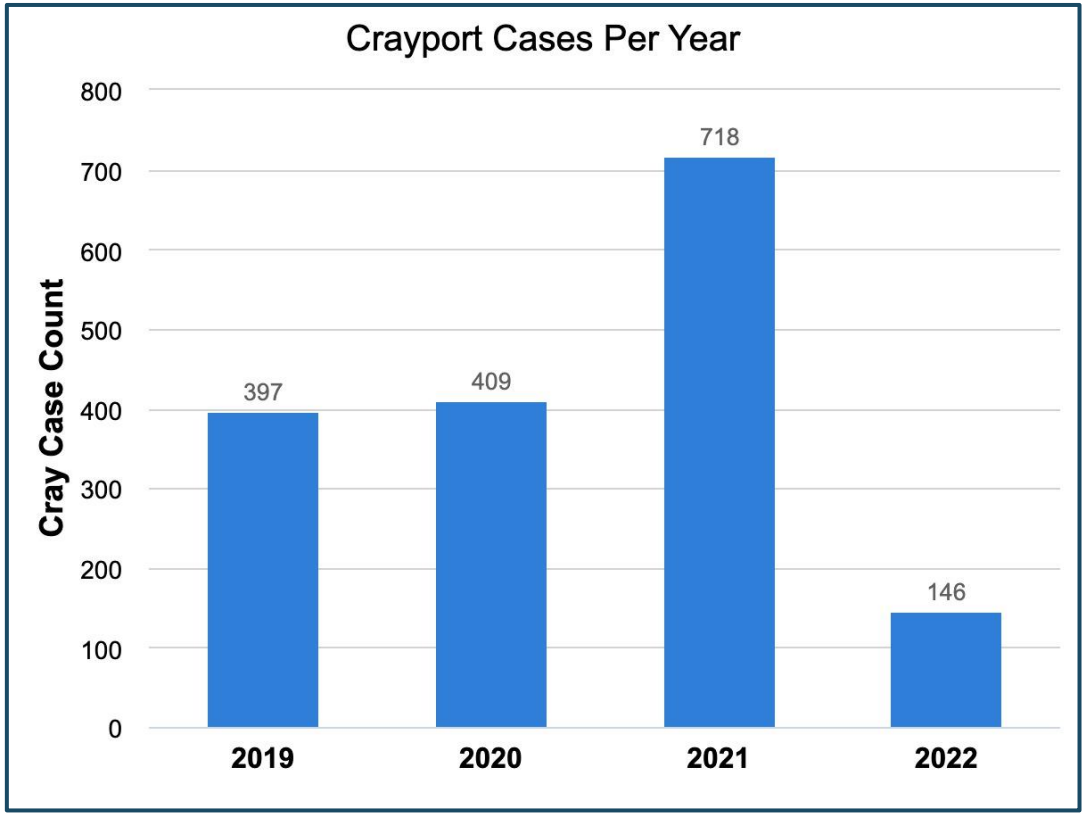
1. Autonomous secure workflow
2. Reduced data entry errors
3. Reduced latency for joint troubleshooting
4. Improved tracking for hardware and software problems
5. Consolidated UI - NERSC “one stop shop” for Cray cases
6. Increased reporting granularity for NERSC

Features

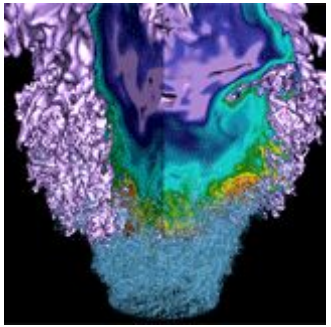
- **For new issues**:
  - Opening new Cray cases from ServiceNow
  - Linking existing cases to ServiceNow records
- **For ongoing issues**:
  - Case details automatically synced between 2 platforms:
    - Priority, title, description
    - Comments
- **For closed issues:**
  - Issue state and resolution notes synced

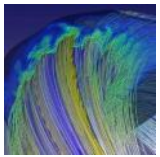
Crayport Retirement

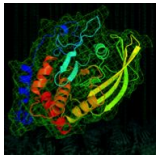
- Feb 2019 - NERSC <> Crayport integration in production
- Feb 26, 2022 - HPE Digital Customer Experience (DCE) replaces Crayport

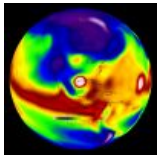


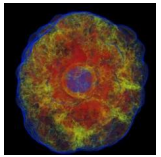
GSEM - API engine for HPE Digital Customer Experience

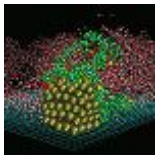












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GSEM vs Crayport API

- Crayport API replaced by GSEM engine
- What's different:
  - Increased security
  - More complex data flows
  - REST-based (Crayport) -> queue-based (GSEM)

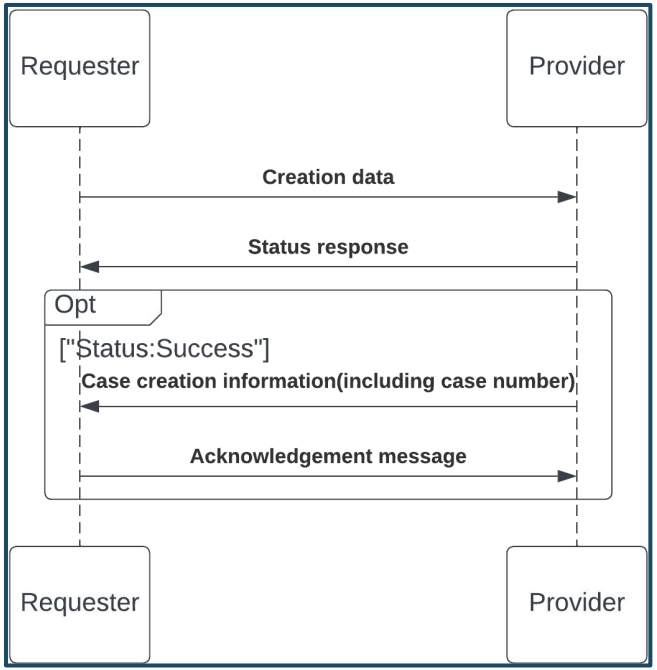
GSEM Security Requirements

- *Crayport*: Basic authentication + Token verification

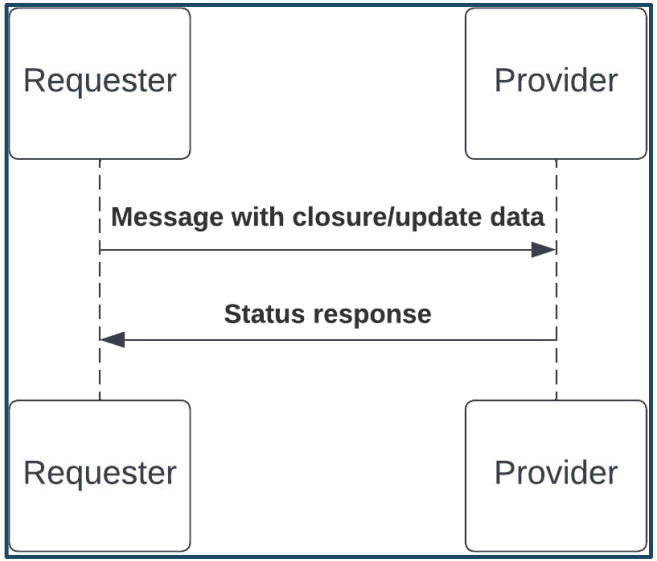
- *GSEM*: Connections authorized only after SSL registration with HPE
  - Certificate must be issued by HPE-approved CA
  - Every request must be signed with registered SSL certificate

Data flow - Sequence diagrams

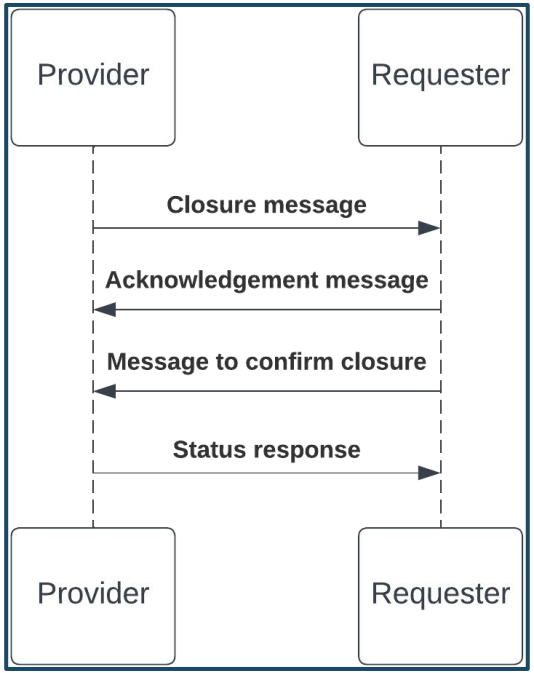
Opening a new case:



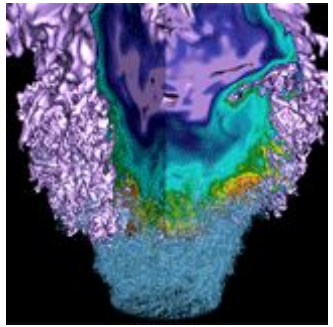
NERSC closing/updating a case:

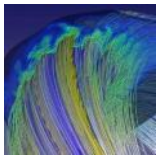


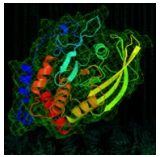
HPE closing a case:

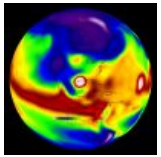


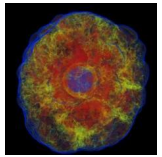
NERSC <> GSEM Integration

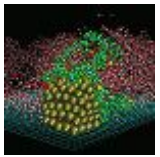












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Features

- **For new issues**:
  - Opening new HPE cases from ServiceNow
- **For ongoing issues**:
  - Case state changes pushed and tracked in ServiceNow
  - Case comments automatically synced between 2 platforms
  - New or updated Onsite Tasks and/or Part Orders pushed and tracked with detailed updates, including state, ETA
- **For closed issues:**
  - Issue state and resolution notes synced
  - Case closure initiated by NERSC in ServiceNow or by HPE in HPE DCE

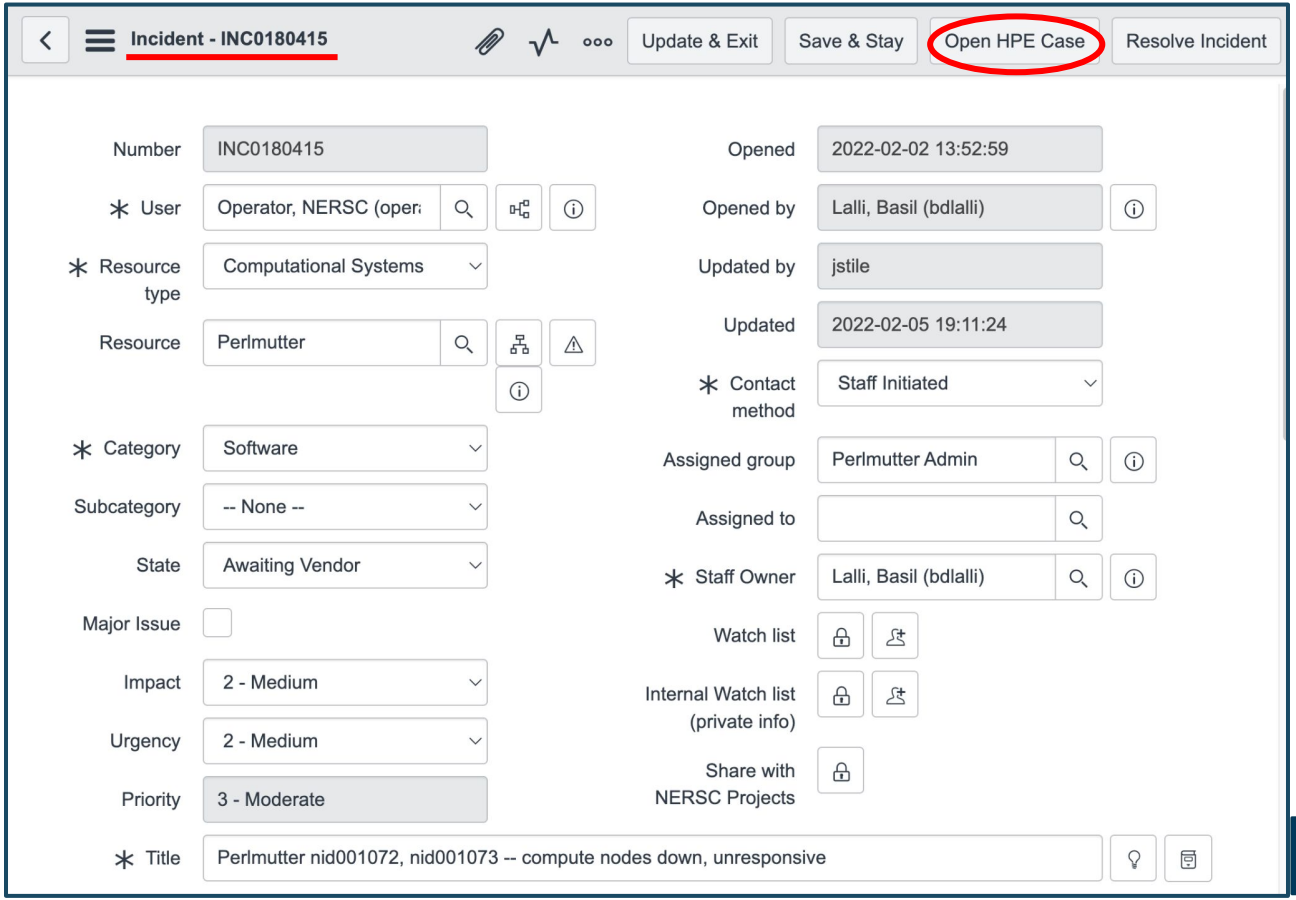
Architecture Overview

Hybrid approach to satisfy HPE security requirements

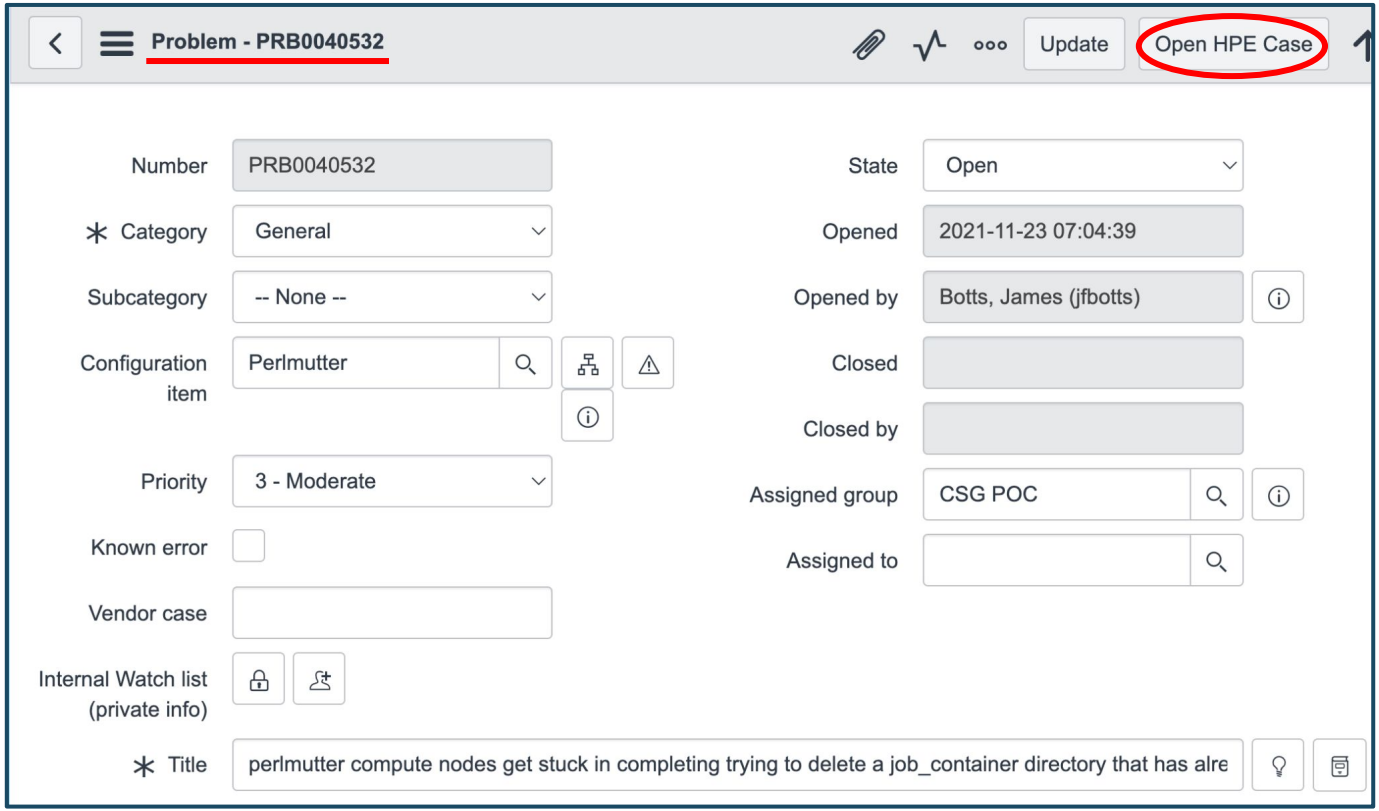
- Frontend configuration and user interface served via ServiceNow - lightweight and familiar
- Backend functionality split between ServiceNow and a local middleware server

Frontend - NERSC Incident

One-time critical issues or alerts



Frontend - NERSC Problem

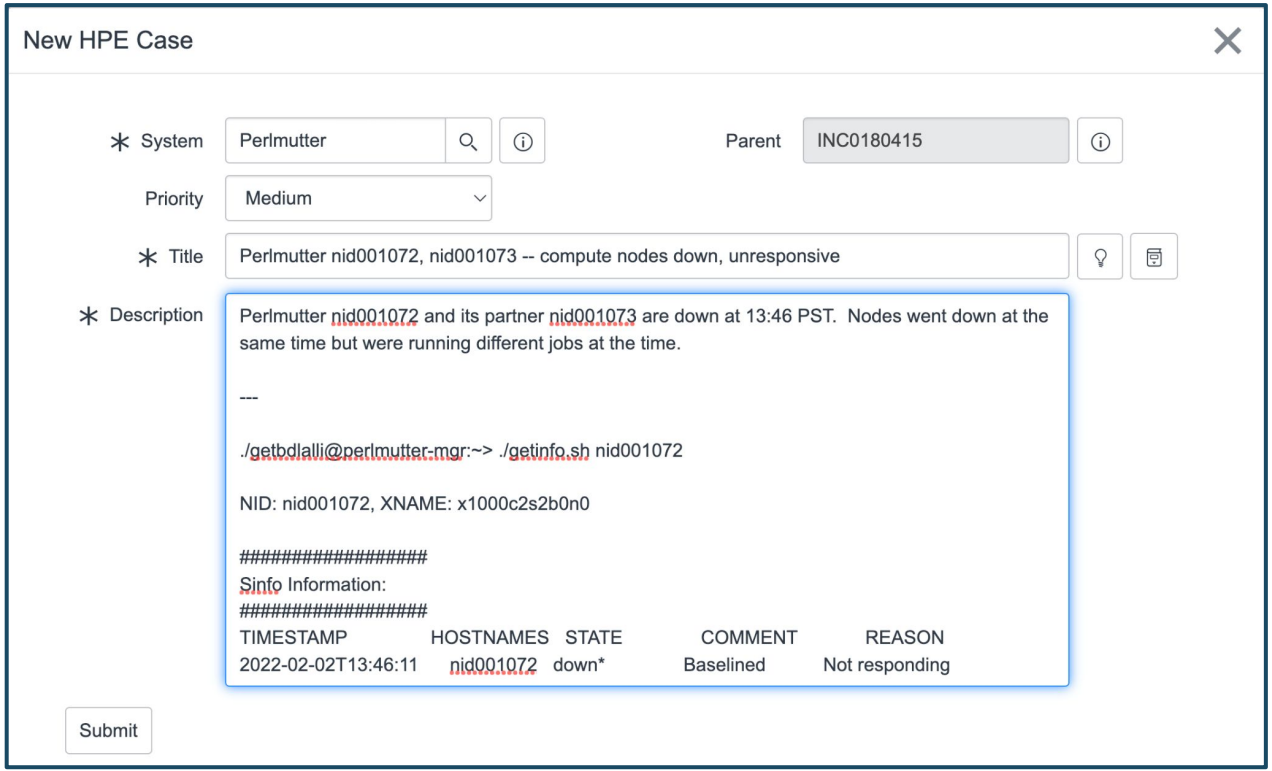


Ongoing/repeated issues or bugs

Frontend - New HPE Case

New case submission form in ServiceNow:

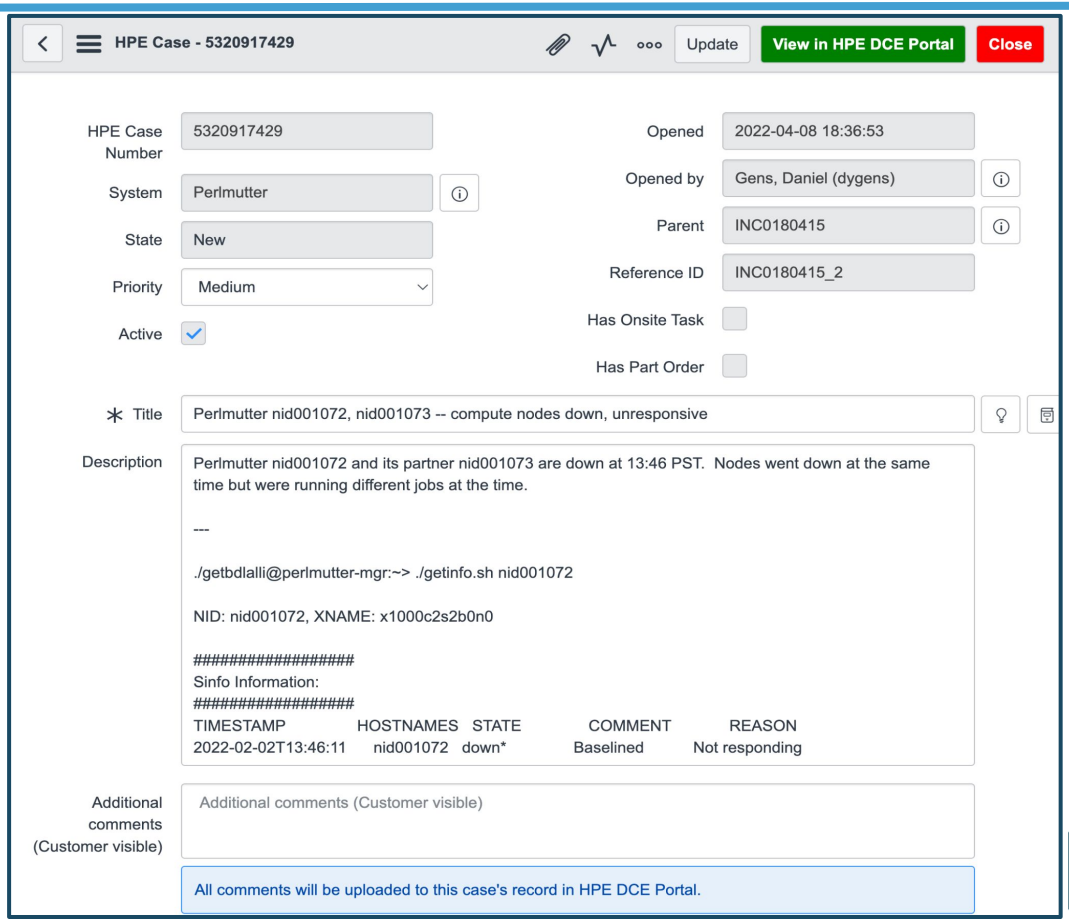
Shows case info before submission to GSEM API



Frontend - Existing HPE Case

Existing case form:

Shows case form in ServiceNow after submission to GSEM API



ServiceNow backend

- Outgoing transactions
  - Submitted to local server backend via HTTP POST messages
  - Covers case submission, outgoing case updates, NERSC-initiated case closure with resolution notes
- Incoming transactions
  - Custom REST API endpoint in ServiceNow
  - Processes and acknowledges incoming HTTP POST messages from GSEM engine
  - Covers incoming case updates, part order and onsite task updates, HPE-initiated case closure with resolution notes

Server Backend

- Deployed in NERSC internal network
- Performs two functions:
  - SSL Certificate validation - not possible directly from ServiceNow
  - JSON format translation

Alternate approach: GSEM Queue

- Alternative to inbound HTTP: GSEM Queue
- Our original design: Much more complex than final version
- Good option to be aware of depending on your infrastructure

Current status

- Our code has been completed and tested
- Currently waiting for local EULA approval
- Move to production upon approval
- Plan to release all components as open source

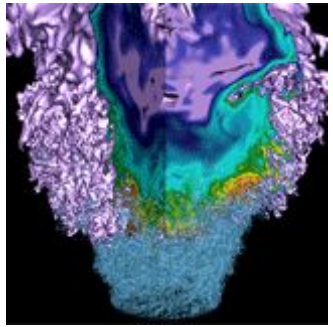
Thank You

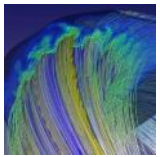
Contact Information

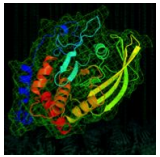
John Gann, **jgann@lbl.gov**

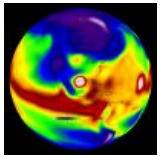
Daniel Gens, **dygens@lbl.gov**

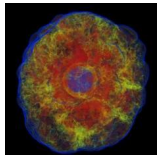
Q&A

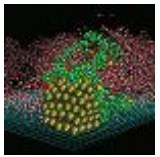




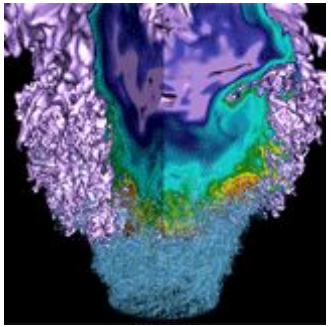


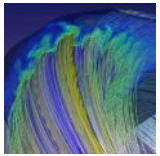


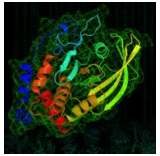


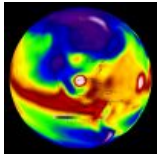


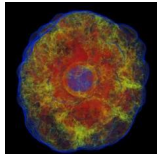
Intro to NERSC

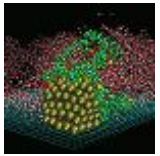












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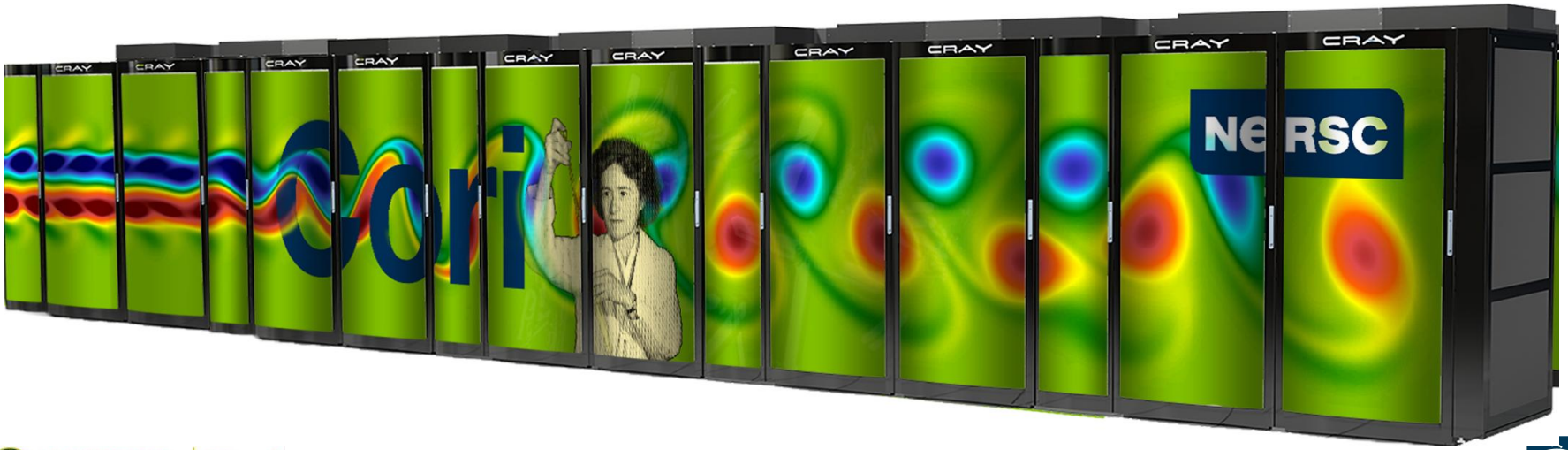
NERSC Basics

- NERSC is the mission HPC facility for the DOE Office of Science
- **~8,000** annual users
- **~1,850** Institutions and National Labs
- 2015 Nobel Prize in Physics supported by NERSC systems and data archive

Cori: XC-40

- 2,388 Intel Xeon "Haswell" processor nodes
- 9,688 Intel Xeon Phi “Knight’s Landing” processor nodes
- 1.8 PB Cray DataWarp Burst Buffer
- 28 PB Lustre Filesystem



Perlmutter: Shasta

- 3x to 4x Cori, Larger and more complex
- AMD CPU only nodes and GPU Nodes
- Slingshot interconnect
- All Flash Lustre Filesystem
- Designed for large scale simulation and data analysis from experimental facilities