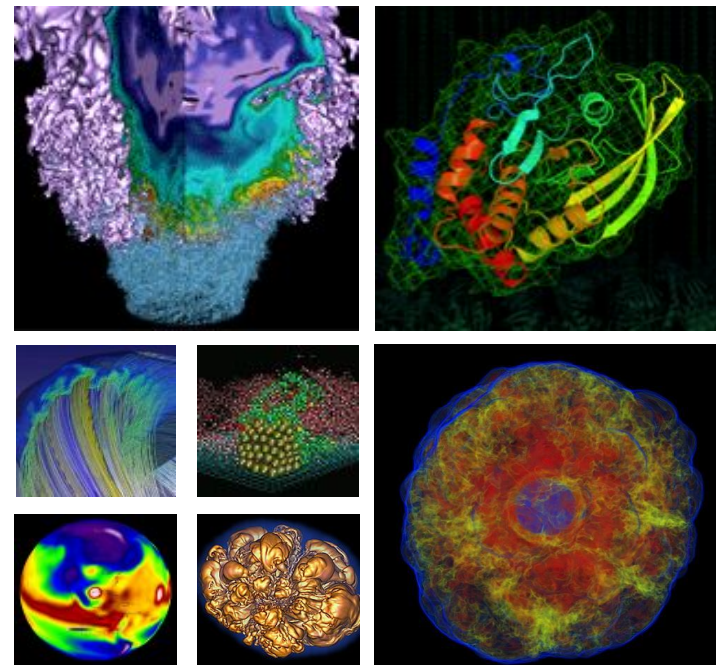


Using HPE-Provided Resources to Integrate HPE Support into Internal Incident Management



John Gann, Daniel Gens, Elizabeth Bautista

What Problem Was Solved?



Managing internal incident records and HPE cases separately introduces several problems:

- If site staff and HPE staff are coordinating, information about the same issue is in two different places.
- Consolidating this information so there is a cohesive narrative about remediation steps requires manual effort.
 - This reduces the timeliness of when the information is available to all parties.
 - It introduces the possibility of errors and omissions
 - During periods of high case volume, it can represent a significant amount of effort for operations staff.
- This issue was previously solved at NERSC with the ServiceNow-CrayPort integration.
 - The retirement of CrayPort came soon after HPE's acquisition of Cray, so these benefits were lost.

HPE DCE Amplifies the Importance



The HPE Digital Customer Experience substantially differs from CrayPort:

- Interface is designed to support a much larger range of products and services.
- CrayPort was streamlined for HPC, with a focus on onsite support services.

The consequence of these differences is that opening a case, and accessing case information, typical involves navigating through many more screens.

For example, at NERSC it typically takes operations staff three times as long to open a case in HPE DCE.

Since this integration allows us to bypass the HPE DCE interface, it saves time in addition to the aforementioned benefits.

Case Creation in Just Two Screens



Incident - INC0180415

Update & Exit Save & Stay **Open HPE Case** Resolve Incident

Number INC0180415

Opened 2022-02-02 13:52:59

* User Operator, NERSC (open)

Opened by Lalli, Basil (bdlalli)

* Resource type Computational Systems

Updated by jstille

Resource Permuter

Updated 2022-02-05 19:11:24

* Category Software

Subcategory -- None --

State Awaiting Vendor

Major Issue

Impact 2 - Medium

Urgency 2 - Medium

Priority 3 - Moderate

* Title Permuter nid001072, nid001073 -- compute nodes down, unresponsive

* Contact method Staff Initiated

Assigned group Permuter Admin

Assigned to

* Staff Owner Lalli, Basil (bdlalli)

Watch list

Internal Watch list (private info)

Share with NERSC Projects



New HPE Case

* System Permuter

Parent INC0180415

Priority Medium

* Title Permuter nid001072, nid001073 -- compute nodes down, unresponsive

* Description

Permuter nid001072 and its partner nid001073 are down at 13:46 PST. Nodes went down at the same time but were running different jobs at the time.

./getbdalli@permuter-mgr:~> ./getinfo.sh nid001072

NID: nid001072, XNAME: x1000c2s2b0n0

#####

\$info Information:

#####

TIMESTAMP	HOSTNAMES	STATE	COMMENT	REASON
2022-02-02T13:46:11	<u>nid001072</u>	down*	Baselined	Not responding

Submit

Case Tracking in Just One Screen



Once a case exists, the following things can be tracked in this ServiceNow page:

- New updates
- Change in title/description
- Whether there is a part order or onsite task

Additionally, new updates can be made to the case from the “additional comments” field.

< ☰ HPE Case - 5320917429

Update View in HPE DCE Portal Close

HPE Case Number5320917429

SystemPerlmutter ⓘ

StateNew

PriorityMedium ▾

Active☒

Opened2022-04-08 18:36:53

Opened byGens, Daniel (dygens) ⓘ

ParentINC0180415 ⓘ

Reference IDINC0180415_2

Has Onsite Task☐

Has Part Order☐

* TitlePerlmutter nid001072, nid001073 -- compute nodes down, unresponsive ⓘ ⓘ

Description

Perlmutter nid001072 and its partner nid001073 are down at 13:46 PST. Nodes went down at the same time but were running different jobs at the time.

./getbdlalli@perlmuter-mgr:~> ./getinfo.sh nid001072

NID: nid001072, XNAME: x1000c2s2b0n0

Sinfo Information:

TIMESTAMPHOSTNAMESSTATECOMMENTREASON
2022-02-02T13:46:11nid001072down*BaselinedNot responding

Additional comments (Customer visible)

Additional comments (Customer visible)

All comments will be uploaded to this case's record in HPE DCE Portal.

The Goal of this Paper



We've presented on this topic before at CUG; the goal of this paper is different:

- Focus is on enabling other sites to design their own integrations, with their own incident management platforms.
- Emphasis on navigating HPE's infrastructure, to best leverage the resources they provide.
 - Administrative processes
 - Technical processes (i.e. leveraging the GSEM API)
 - Legal considerations
- Less focus on the specific design of our integration.
 - Will discuss it when relevant to differences from previous CrayPort integration.

New Challenges



Reworking our previous integration to work with the new API presented some new challenges:

- Availability of the API was under-emphasized.
- New API had much stricter requirements for authentication.
 - Restrictive enough that ServiceNow could not natively accommodate them.
- HPE administrative process for approving external integrations is much more robust.
- Documentation was not optimal for our purposes.
 - Proper payloads had to be designed via trial and error.
- API is not directly connected to HPE DCE, but rather to an internal HPE platform that HPE DCE is also connected to.
 - This introduces some limitations that will be discussed.

Even though working with HPE introduces some new challenges, HPE also offers robust support:

- Simulated API test environment
- Global Service Event Management(GSEM) API has very detailed error messages.
- Large team supporting API, providing high-touch service:
 - Real-time meetings and close correspondence helped us navigate a variety of issues.

The Dev Console



The dev console simulates the production API.

Here, you can:

- Test how it will respond to a specific payload
- View/Manipulate the queue of outgoing messages

Combined with the robust error messages, this helped us glean the information the documentation lacked.

A screenshot of the "Dev Console" web application. The interface has a top navigation bar with tabs: "VCard Report", "Search Event", "View Queue", "Requester" (which is highlighted with a green underline), "Provider", and "GSEM Agreement". The main content area is divided into several sections. On the left, under the "Requester Sample" heading, there are two dropdown menus: "Agent Key *" with the value "NERSC_Train_R - xyjNIVVLIZdhlZdISC1A" and "Transaction Type*" with the value "Select". Below these is a large text area labeled "JSON" with a "Copy" button to its right. At the bottom of this section are four buttons: "Generate JSON", "Submit", "Clear", and "Start". To the right of this section is the "Provider Loop" section, which has an "Agent Key" dropdown menu with the value "Select" and three buttons below it: "Start", "Stop", and "Clear". Below the "Provider Loop" section is a large text area labeled "Provider Loop Output". At the bottom of the interface is a section labeled "Requester Sample Output" which is currently empty.

Leveraging the GSEM Team



Real-time meetings with HPE's GSEM team were invaluable for:

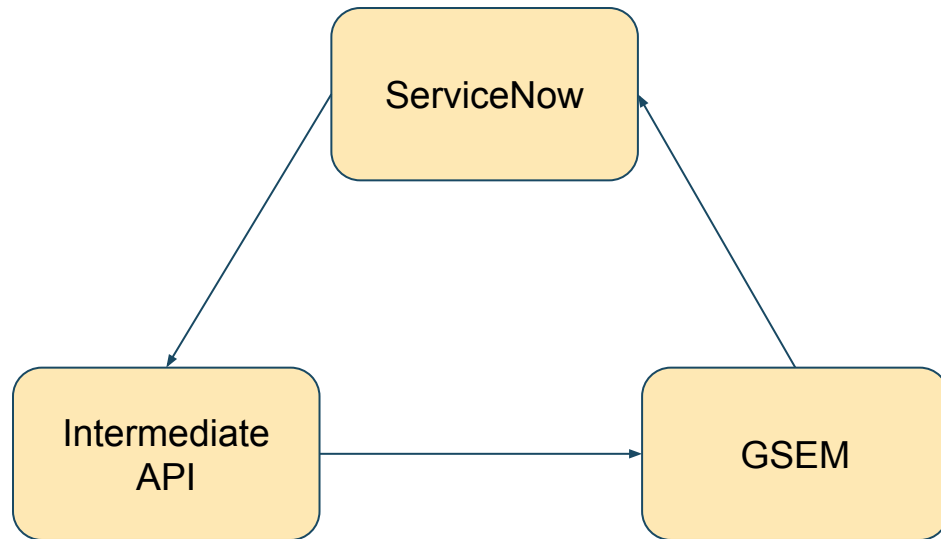
- Learning to use the dev console
- Navigating the complex authorization and authentication processes
- Troubleshooting unexpected problems
 - Pre-deployment
 - Post-deployment
- Navigating HPE's IT certification process
- Identifying points of contact for permissions issues, legal considerations, and development requests

Our Design



Outbound data, such as case creation requests, go to GSEM through an intermediate API hosted in our data center.

Inbound data comes into ServiceNow directly from GSEM, through one of ServiceNow's Scripted REST APIs.



Role of the Intermediate API



The intermediate API was necessitated by GSEM security requirements:

- GSEM requires host-specific SSL certificates (wildcards are not permitted).
- ServiceNow could not guarantee which host would generate a request.
 - Due to ServiceNow being a distributed cloud platform.
- The intermediate API allows a consistent host to be used for outbound requests.

Ancillary Benefits of the Intermediate API



The use of the intermediate API allowed the use of a more robust programming environment than ServiceNow provides. This was useful for several things:

- Creating the complex payload required by GSEM
- Implementing robust error handling and retry logic
- Increasing transparency when debugging

Alternate Approach: GSEM Queue



- Alternative to inbound HTTP: GSEM Queue
- Our original design: Much more complex than final version
- Since it allows the middleware to mediate both inbound and outbound messages, the same benefits are conferred to both.

Limitations Introduced by the API



GSEM has some limitations that affect how well the integration works:

- Cases open with a significant delay, meaning initially, synchronization is not near real-time.
- Cases updates made via GSEM are not visible in HPE DCE and vice versa.
- GSEM does not supply HPE user metadata in case updates, making actions unattributable.

Legal Considerations



- GSEM's EULA is comprehensive and will possibly contain provisions that conflict with existing contracts.
- For us, it took longer for our legal department to navigate this issue than it did for us to develop the integration.
- The EULA is not required for the dev console, so development can proceed in parallel with legal negotiations.
 - Starting early would have cut our time-to-deployment by one third.

Post-Deployment Experience



Despite extensive testing and IT certification from HPE, there have been permission and visibility issues post-deployment:

- Permissions work differently in GSEM than HPE DCE.
- Key stakeholders in our organization did not have necessary permissions to see cases created with GSEM.
- Issue was invisible during testing and development because developers and GSEM team had full permissions from the outset.

We are continuing to lobby HPE for the API changes that would remove some of the existing limitations, and we will accommodate those changes when they are made.

For now, there are some additional enhancements that can be implemented:

- Segregating part order and onsite task updates into their own record.
- Enabling case attachments to be synchronized.



NERSC

Thank You



U.S. DEPARTMENT OF
ENERGY

Office of
Science



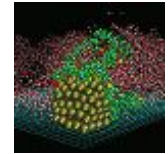
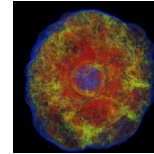
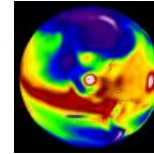
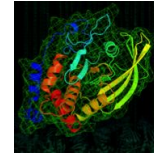
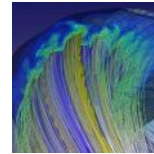
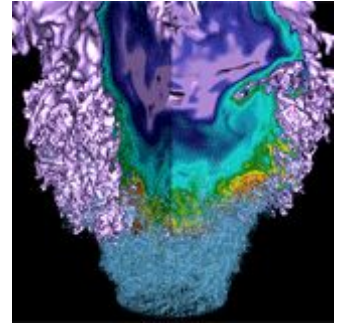
Contact Information



John Gann, jgann@lbl.gov

Daniel Gens, dygens@lbl.gov

Q&A



U.S. DEPARTMENT OF
ENERGY

Office of
Science

