The Art of Conversation
With CrayPort
Bidirectional Record Management

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Cray User Group
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NERSC Basics

- NERSC is the mission HPC facility for the DOE Office of Science
- Over 7,000 Users, 870 Projects, 700 codes
- > 2000 publications per year
- 2015 Nobel Prize in Physics supported by NERSC systems and data archive
- Diverse workload type and size
  - Biology, Environment, Materials, Chemistry, Geophysics, Nuclear Physics, Fusion Energy, Plasma Physics, Computing Research
- New Experimental and AI-driven workloads
Cori - XC-40

- 2,388 Intel Xeon "Haswell" processor nodes,
- 9,688 Intel Xeon Phi "Knight's Landing" 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
Previous Email-Based Workflow

ServiceNow Incident created → Cray Case opened → Cray provides initial update → Cray / NERSC provide further updates
Current RESTful API-Driven Workflow

ServiceNow Incident created

Cray Case opened

Cray provides initial update

Cray / NERSC provide further updates
Service-Now Modules
Design and Test JSON Payloads

CrayPort API

<table>
<thead>
<tr>
<th>Assets V1</th>
<th>Show/Hide</th>
<th>List Operations</th>
<th>Expand Operations</th>
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<tbody>
<tr>
<td>Attachments V1</td>
<td>Show/Hide</td>
<td>List Operations</td>
<td>Expand Operations</td>
</tr>
<tr>
<td>Cases V1</td>
<td>Show/Hide</td>
<td>List Operations</td>
<td>Expand Operations</td>
</tr>
<tr>
<td>GET</td>
<td>/api/crayport/odata/v1/cases</td>
<td>Return cases</td>
<td></td>
</tr>
<tr>
<td>POST</td>
<td>/api/crayport/odata/v1/cases</td>
<td>Create a case</td>
<td></td>
</tr>
<tr>
<td>GET</td>
<td>/api/crayport/odata/v1/cases({CaseNumber})</td>
<td>Return a specific case</td>
<td></td>
</tr>
<tr>
<td>PATCH</td>
<td>/api/crayport/odata/v1/cases({CaseNumber})</td>
<td>Update case fields</td>
<td></td>
</tr>
</tbody>
</table>

Comments V1

Part Orders V1

Shipping Details V1

Metadata

[ BASE URL: /api/crayport/odata/v1 ]
JSON payload model

GET /api/crayport/odata/v1/cases
POST /api/crayport/odata/v1/cases

Response Class (Status 201)
Created
Model: Example Value

{  
  "CaseNumber": "12345",  
  "Status": "Unassigned",  
  "IsClosed": "true",  
  "Subject": "Test Subject",  
  "Description": "Test Description",  
  "ContactEmail": "Contact2TestEmail.com",  
  "AssignedTo": "TestUser",  
  "Asset": "123456789",  
  "Type": "Hardware",  
  "Priority": "Important",  
}

Response Content Type: application/json

Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
<th>Parameter Type</th>
<th>Data Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>$expand</td>
<td></td>
<td>Expands related entities inline.</td>
<td>query</td>
<td>string</td>
</tr>
<tr>
<td>$select</td>
<td></td>
<td>Selects which properties to include in the response.</td>
<td>query</td>
<td>string</td>
</tr>
</tbody>
</table>

CrayPortCase [required]

Parameter content type: application/json

Authorization [required]

Basic HTTP Authentication

header string
Cray Case Class

CrayPortCase {
    CaseNumber (string),
    Status (string),
    IsClosed (string),
    Subject (string),
    Description (string),
    ContactEmail (string),
    AssignedTo (string),
    Asset (string),
    Type (string),
    Priority (string),
    PriorityChangeReason (string),
    Product (string),
    Component (string),
    Version (string),
    BugType (string),
    BugNumber (string),
    BugFixedIn (string),
    ExternalReference (string)
}
Cray Case Class in SN Studio

Update Cray Case w...  
Business Rule

Script Include

CrayCase

Name

CrayCase

Application

CrayPort

API Name

x_ners2_crayport.CrayCase

Accessible from

This application scope only

Client Enable

Active

Description

Cray Case class definition.

Script

```
14 var gr = new GlideRecord('incident');
15 gr.getIncSysId();
16 var cr = new GlideRecord('x_ners2_crayport_cray_case');
17 cr.getCaseSysId();
18 var util = new global.MyGlobalScopeThis();
19 util.sleep(180000);
20
21 var r = new sn_ws.RESTMessageV2('x_ners2_crayport.Cases', 'POST new case!');
22 r.setStringParameterMd5Escape('subject', this._escapeQuotes(gr.cray_case_subject));
23 r.setStringParameterMd5Escape('type', 'General Inquiry');
24 r.setStringParameterMd5Escape('asset', cr.cray_asset_serial_number);
25 r.setStringParameterMd5Escape('description', this._escapeQuotes(gr.description));
26 r.setStringParameterMd5Escape('priority', cr.priority.displayLabel(), tolowerCase());
27
28 var email = gr.getUser().getEmail();
29 if (gr.getUser().isCredentialsValid())
30 email = 'operator@nersc.gov';
31 r.setStringParameterMd5Escape('email', email);
32
33 this._checkInstance(r);
34
35 var response = r.execute();
36 var responseBody = JSON.parse(response.getBody());
37
38 var httpStatus = response.getStatus();
```
Integration Advantages

- Real-time, automated record updating
- Reduced incident processing time
- Improved communication between engineering teams
- Facilitated reporting and incident review
- Secure authentication between NERSC and Cray
Current Features

- New Cray case submission
- Case Priority Change
- Case details updates
- Bidirectional Comment updates (public comments)
- Linking an existing Cray case to a ServiceNow Incident
Some Data for 2018

<table>
<thead>
<tr>
<th>System</th>
<th>Cori</th>
<th>Edison</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cray cases</td>
<td>674</td>
<td>230</td>
</tr>
<tr>
<td>Projected time savings</td>
<td>~136 hours</td>
<td>~50 hours</td>
</tr>
</tbody>
</table>

Projection based on estimated time to open Cray case:

- Old workflow: 15 minutes
- New workflow: 2 minutes
API Publicly Available as of May 3rd

- Crayport API Info
  - [https://crayport-api.cray.com/](https://crayport-api.cray.com/)

- NERSC Integration Gitlab Repo
  - Source Code
    - [https://gitlab.com/crayport/crayport-code](https://gitlab.com/crayport/crayport-code)
  - ServiceNow App
    - [https://gitlab.com/crayport/crayport-app](https://gitlab.com/crayport/crayport-app)
Info on ServiceNow Integration

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Questions

Thank You