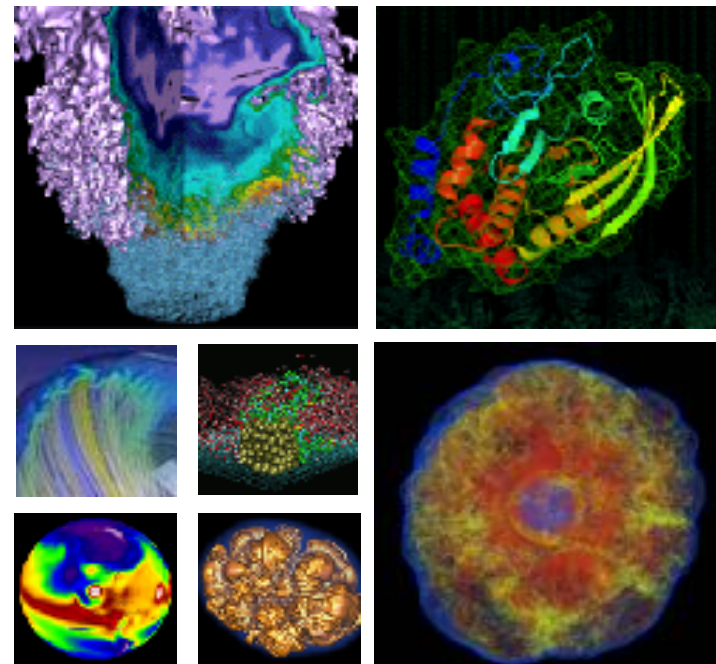


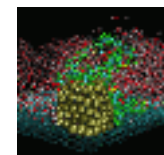
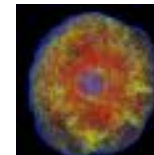
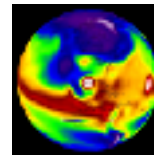
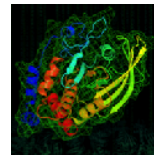
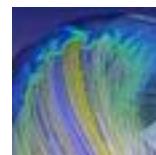
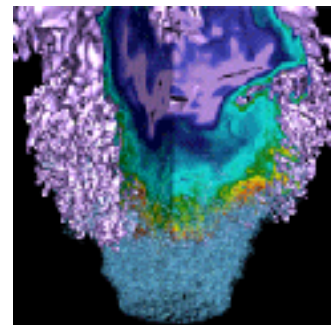
# Writing a SeaStream plugin



Cary Whitney

Stockholm/May 23, 2018

# Outline



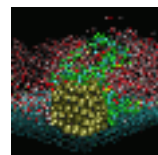
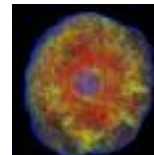
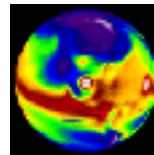
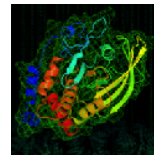
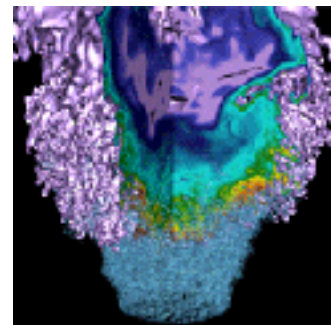
# Outline

---



- SeaStream
  - What it is?
  - What is available?
- Plugin
  - Base
  - Modifications
- Output
- Uses
- Future data

# Setup Sonexion



# Enable SeaStream



```
#> cscli admins
cscli: Invalid command "admins".
```

Checks to see which modules are enabled.

Create a streaming user, I'm showing the preferred method which requires the admins module, see the README for others.

```
#> cscli admins add --username=streamapi --role=readonly --disable-ssh --enable-web
Enter the password :
Confirm the password :
```

```
#> cscli service_console configure rest_api enable
REST API has been enabled
#> cscli service_console configure rest_api show
REST API access: enabled
```

REST API authorized users:

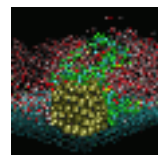
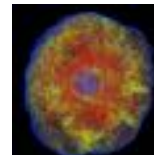
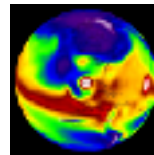
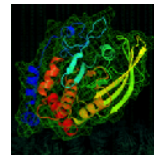
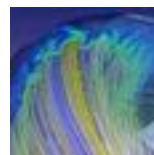
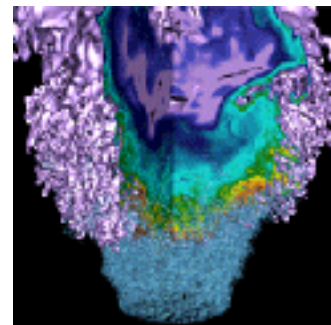
No users configured

```
cscli service_console configure rest_api user_add --username=streamapi
User 'streamapi' has been added to REST API authorized users list
#> cscli service_console configure rest_api show
REST API access: enabled
```

REST API authorized users:

streamapi

# Installing SDK



# Requirements

---



- RAS-685 SDK
- Python 2.7.5
- Python-twisted-web 12.2 or higher
- M2crypto-0.21.1-17.el7.x86\_64.rpm
- Pyserial-2.6-6.el7.noarch.rpm
- python-twisted-core-12.2.0-4.el7.x86\_64.rpm
- SOAPpy-0.11.6-17.el7.noarch.rpm
- Python-fpconst-0.7.3-12.el7.noarch.rpm
- python-twisted-web-12.1.0-5.el7\_2.x86\_64.rpm

# Install SDK

---



Install SeaStream

```
#> cd seastream
```

```
#> python setup.py install
```

```
#> cd ..
```

Install the SeaStream plugin support

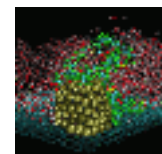
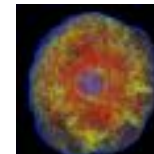
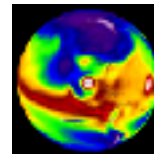
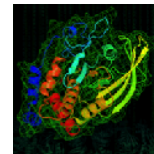
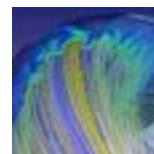
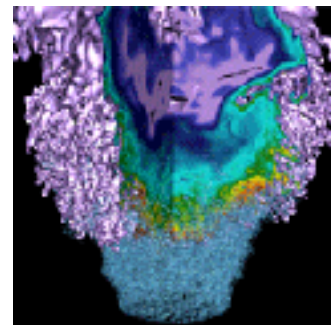
```
#> cd plugin_support
```

```
#> python setup.py install
```

```
#> cd ..
```

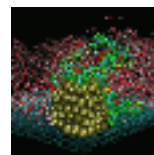
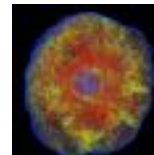
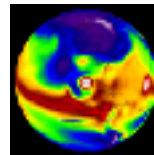
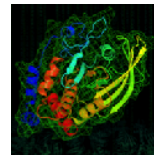
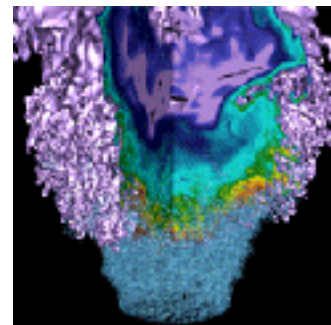


# Data Available



| <b>node_stats</b>     |             | <b>fs_stats</b>   |             |
|-----------------------|-------------|-------------------|-------------|
| <b>Metric</b>         | <b>Unit</b> | <b>MDT Metric</b> | <b>Unit</b> |
| Memory_Usage          | percent     | available_space   | Bytes       |
| Memory_Free           | Bytes       | free_inodes       | inodes      |
| Memory_Cached         | Bytes       | free_space        | Bytes       |
| Memory_Buffers        | Bytes       | open              | Ops/sec     |
| CPU_Usage             | percent     | close             | Ops/sec     |
| CPU_idle_time         | percent     | mkdir             | Ops/sec     |
| CPU_iowait_time       | percent     | rmdir             | Ops/sec     |
| CPU_nice_time         | percent     | link              | Ops/sec     |
| CPU_system_time       | percent     | unlink            | Ops/sec     |
| CPU_softirq_time      | percent     | create            | Ops/sec     |
| CPU_user_time         | percent     | destroy           | Ops/sec     |
| CPU_Interrupts        | ips         | connect           | Ops/sec     |
| Processor_load_1_min  | avg         | reconnect         | Ops/sec     |
| Processor_load_5_min  | avg         | disconnect        | Ops/sec     |
| Processor_load_15_min | avg         | getattr           | Ops/sec     |
|                       |             | getxattr          | Ops/sec     |
| <b>fs_stats</b>       |             | setattr           | Ops/sec     |
| <b>OST Metric</b>     | <b>Unit</b> | rename            | Ops/sec     |
| read                  | Bytes/sec   | notify            | Ops/sec     |
| write                 | Bytes/sec   | mknod             | Ops/sec     |
| available_space       | Bytes       | statfs            | Ops/sec     |
| total_space           | Bytes       | quotactl          | Ops/sec     |
| free_space            | Bytes       | process_config    | Ops/sec     |
| free_inodes           | inodes      | llog_init         | Ops/sec     |
| total_inodes          | inodes      |                   |             |

# Plugin Structure



# Plugin organization

---



- PluginStreamerConsumer
  - Sets up global information
  - Insert/Update/Delete data metrics
  - Call the correct data stream
    - Parse\_fs\_stats
    - Parse\_node\_stats
    - Parse\_jobstat
- SeaStreamRabbitMQ
  - Gather information from the configuration file
  - Connect to RabbitMQ
  - Send metric
  - Parse all 3 stats type (generates metric data structure that gets converted to JSON)

# OpenTSDB config file



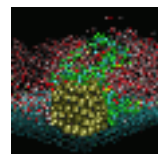
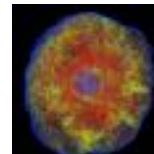
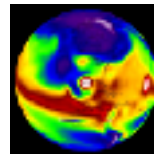
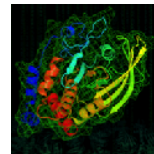
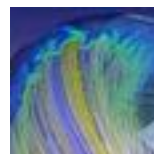
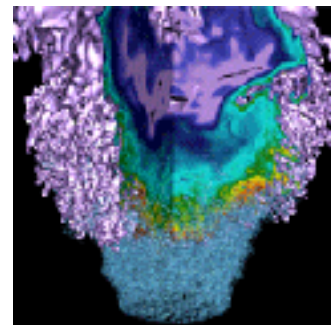
```
{  
    "hosts": ["https://x.x.x.x"],  
    "port": 443,  
    "user": "streamapi",  
    "password": "PXXXXXXXXXXYY$$",  
    "stream": "fs_stats",  
    "plugin_mode": "test_formatter",  
    "dbhost": "ipaddress",  
    "dbport": "4242"  
}
```

# RabbitMQ Config



```
{  
  "hosts": ["https://1.2.3.4"],  
  "port": 443,  
  "user": "streamapi",  
  "password": "SuperSecretPassword",  
  "stream": "node_stats",  
  "plugin_mode": "xtest_formatter",  
  "mqhostname": "rabbit.server.domain",  
  "mqport": 1234,  
  "exchange": "rabbit-exchange",  
  "routingkey": "rabbit.routing.key",  
  "mqsystem": "system name",  
  "mount": "mount point label",  
  "type": "lustre",  
  "login": "rabbitAccount",  
  "mqpassword": "rabbitPassword"  
}
```

# Sample Output



# OpenTSDB output



```
[opentsdb]> python seastream_opentsdb.py -c opentsdb_fs_stats.json
```

```
Streaming data from the fs_stats stream
```

```
{'timestamp': 1522785624, 'metric': u'notify', 'value': 0.0, 'tags': {'category': 'fs_stats', 'host': u'snx11039n003', 'target': 'MDT0000', 'filesystem_name': u'snx11039', 'target_type': u'MDT', 'system': '', 'unit': u'Ops/sec', 'filesystem_type': 'lustre'}}
```

```
{'timestamp': 1522785624, 'metric': u'mknod', 'value': 0.0, 'tags': {'category': 'fs_stats', 'host': u'snx11039n003', 'target': 'MDT0000', 'filesystem_name': u'snx11039', 'target_type': u'MDT', 'system': '', 'unit': u'Ops/sec', 'filesystem_type': 'lustre'}}
```

```
{'timestamp': 1522785624, 'metric': u'mkdir', 'value': 0.0, 'tags': {'category': 'fs_stats', 'host': u'snx11039n003', 'target': 'MDT0000', 'filesystem_name': u'snx11039', 'target_type': u'MDT', 'system': '', 'unit': u'Ops/sec', 'filesystem_type': 'lustre'}}
```



# RabbitMQ Output

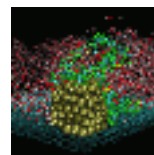
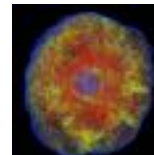
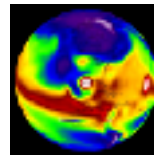
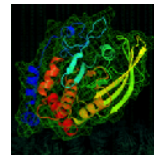
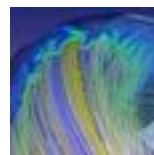
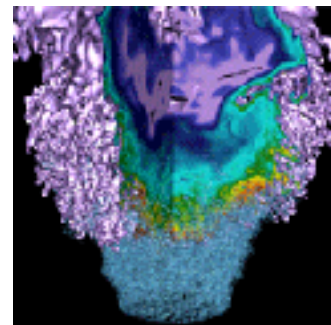


```
[rabbitmq]> python seastream_rabbitmq.py -c rabbitmq_snx11039_node_stats.json
```

```
Streaming data from the node_stats stream
```

```
{"category": "node_stats", "host": "snx11039n003", "mount": "scratch1", "unit": "avg", "timestamp":  
  "2018-04-03T14:45:13+0000", "metric": "Processor_load_5_min", "identifier": "", "system": "snx11039", "value": 0.0194}  
{"category": "node_stats", "host": "snx11039n003", "mount": "scratch1", "unit": "percent", "timestamp":  
  "2018-04-03T14:45:56+0000", "metric": "CPU_Usage", "identifier": "", "system": "snx11039", "value": 0.0}  
{"category": "node_stats", "host": "snx11039n003", "mount": "scratch1", "unit": "percent", "timestamp":  
  "2018-04-03T14:45:43+0000", "metric": "CPU_idle_time", "identifier": "", "system": "snx11039", "value": 99.6218}  
{"category": "node_stats", "host": "snx11039n003", "mount": "scratch1", "unit": "ips", "timestamp":  
  "2018-04-03T14:45:13+0000", "metric": "CPU_Interrupts", "identifier": "", "system": "snx11039", "value": 533.0}  
{"category": "node_stats", "host": "snx11039n003", "mount": "scratch1", "unit": "avg", "timestamp":  
  "2018-04-03T14:45:13+0000", "metric": "Processor_load_15_min", "identifier": "", "system": "snx11039", "value":  
  0.0169}  
{"category": "node_stats", "host": "snx11039n003", "mount": "scratch1", "unit": "avg", "timestamp":  
  "2018-04-03T14:45:13+0000", "metric": "Processor_load_1_min", "identifier": "", "system": "snx11039", "value": 0.0194}  
{"category": "node_stats", "host": "snx11039n003", "mount": "scratch1", "unit": "percent", "timestamp":  
  "2018-04-03T14:45:43+0000", "metric": "CPU_iowait_time", "identifier": "", "system": "snx11039", "value": 0.0}  
{"category": "node_stats", "host": "snx11039n004", "mount": "scratch1", "unit": "percent", "timestamp":  
  "2018-04-03T14:45:06+0000", "metric": "CPU_user_time", "identifier": "", "system": "snx11039", "value": 1.2832}
```

# Grafana Dashboard



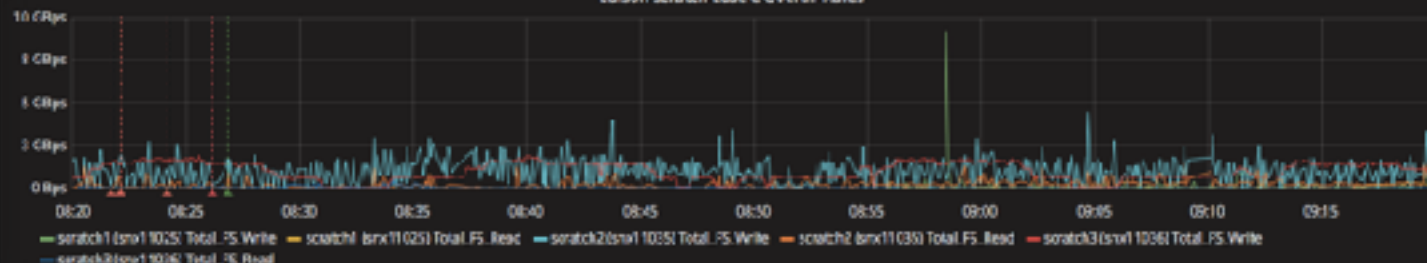


NID 1017- jobID AB- LIC 79116- Job Start Time (Green) Job End Time (Red)

## Job List

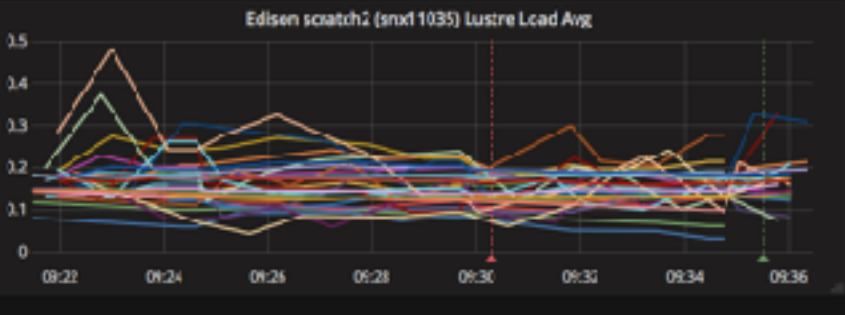
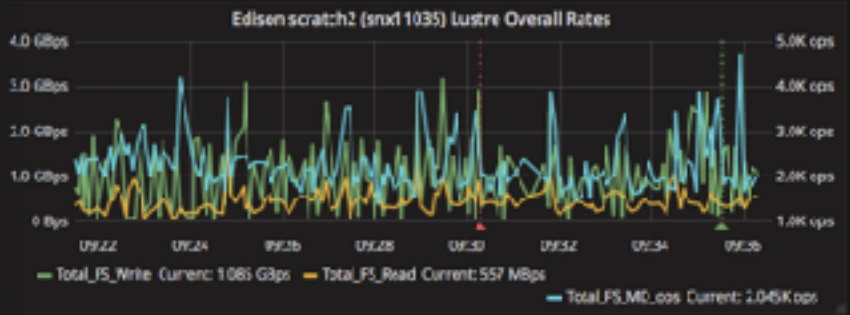
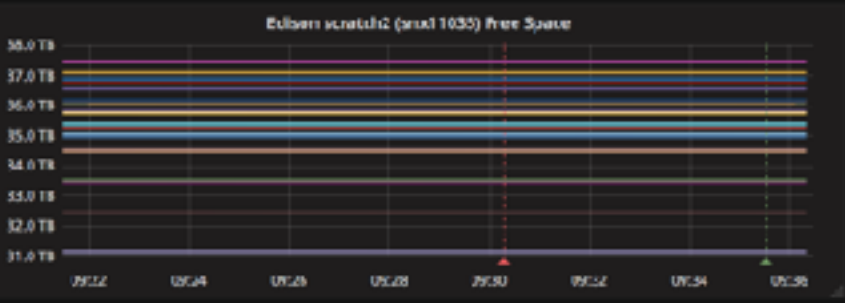
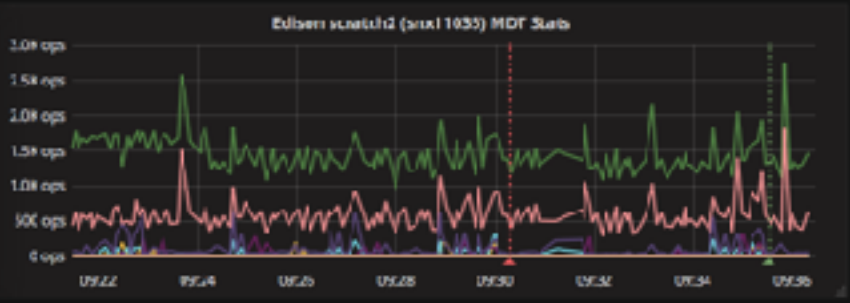
| dateTime                 | uid   | jobID   | event | codes | nids   |
|--------------------------|-------|---------|-------|-------|--|
| 2018-04-04T08:36:48.0700 | 73155 | 8907220 | 1     | 24    | 958, 956, 957, 958, 959, 960, 971, 972, 973, 974, 982, 996, 1015, 1017, 1022, 1023, 1034, 1025, 1026, 1027, 1036, 4570, 5489, 5490 |
| 2018-04-04T08:34:10.0700 | 73155 | 8907225 | 1     | 24    | 958, 956, 957, 958, 959, 960, 971, 972, 973, 974, 982, 996, 1015, 1017, 1022, 1023, 1024, 1025, 1026, 1027, 1036, 4570, 5489, 5490 |
| 2018-04-04T08:22:34.0700 | 73155 | 8907220 | 1     | 24    | 958, 956, 957, 958, 959, 960, 971, 972, 973, 974, 982, 996, 1015, 1017, 1022, 1023, 1034, 1025, 1026, 1027, 1036, 4570, 5489, 5490 |
| 2018-04-04T08:21:41.0700 | 73155 | 8907225 | 1     | 16    | 958, 956, 957, 958, 959, 960, 971, 972, 973, 974, 982, 996, 1015, 1017, 1022, 1023   |

## Edison scratch Lustre Overall Rates

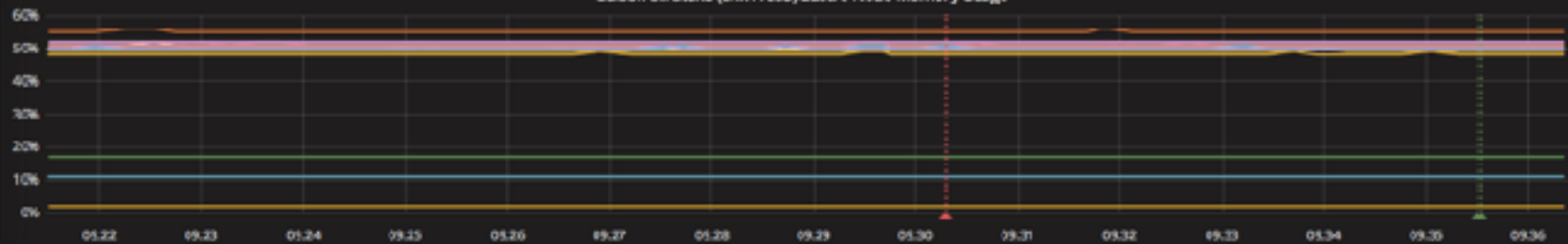


## Edison scratch Lustre MD Overall Rates





Edison scratch2 (snx11035) Lustre Node Memory Usage

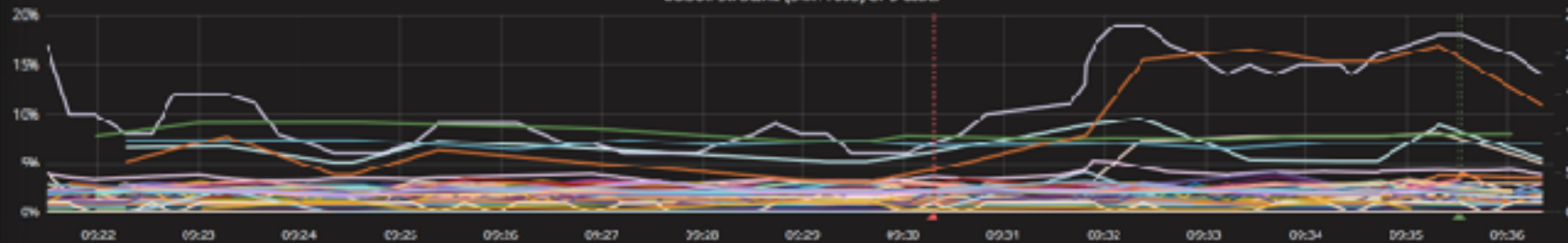


Empty Space

Dashboard Row

Dashboard Row

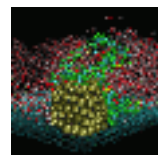
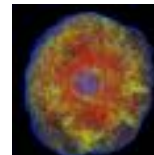
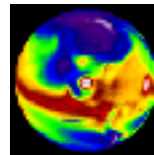
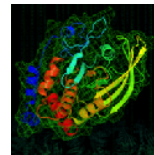
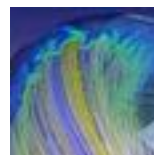
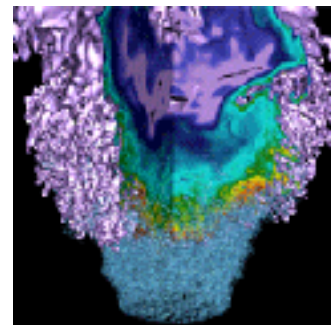
Edison scratch2 (snx11035) CPJ Stats



Edison scratch2 (snx11035) Node Memory



# JSON Dashboard



# Dashboard JSON



```
{
  "annotations": {
    "list": [
      {
        "builtIn": 1,
        "datasource": "-- Grafana --",
        "enable": true,
        "hide": true,
        "iconColor": "rgba(0, 211, 255, 1)",
        "name": "Annotations & Alerts",
        "type": "dashboard"
      },
      {
        "datasource": "Edison-SEDC",
        "enable": true,
        "hide": false,
        "iconColor": "#629e51",
        "limit": 100,
        "name": "Job Start Time (Green)",
        "query": "event:1 AND jobid:$jobid",
        "showIn": 0,
        "tags": [],
        "textField": "jobid",
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"timepicker": {
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    "10s",
    "30s",
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    "1h",
    "2h",
    "1d"
  ],
  "time_options": [
    "5m",
    "15m",
    "1h",
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    "12h",
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"version": 11
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