

# PPI Node Report

---

MANAGEMENT COUNCIL MEETING

2015 SEPTEMBER 28-29

# Outline

---

- What's New
  - Archiving
  - Software
- Potential Issues (next 24 months)
- Sub-node Issues
- Mission Issues

# What's New (Archiving)

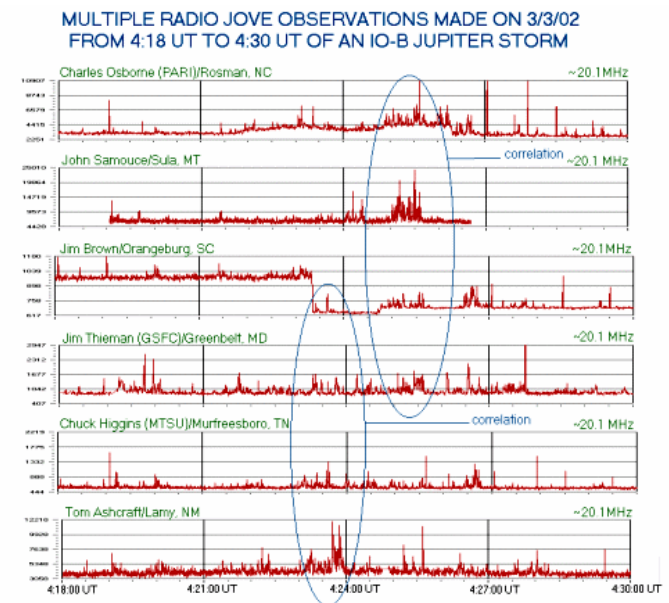
---

## Outline

- Ground radio observation of Jupiter (Radio JOVE)
- Simulations and models
- Increase in results from DAP projects (higher order/derived)
- Big Data management (mimic) and user tools
  - Optimized downloads, store in the cloud (S3, Google)

# Ground radio observation of Jupiter

- Radio JOVE (<http://radiojove.gsfc.nasa.gov/>)  
Students and amateur scientists observe and analyze natural radio emissions of Jupiter, the Sun, and our galaxy.
- The Radio JOVE project began in 1998. Since then, more than 1,100 teams of students and interested individuals have build radio telescopes.
- Global Observing Network  
Live Data From:
  - + U. Florida (USA)
  - + Windward C.C. (Hawaii, USA)
  - + Kochi College (Japan)
  - + Student Observation Network (World Wide)
- No permanent archive of data...  
Until now



# Simulations and Models

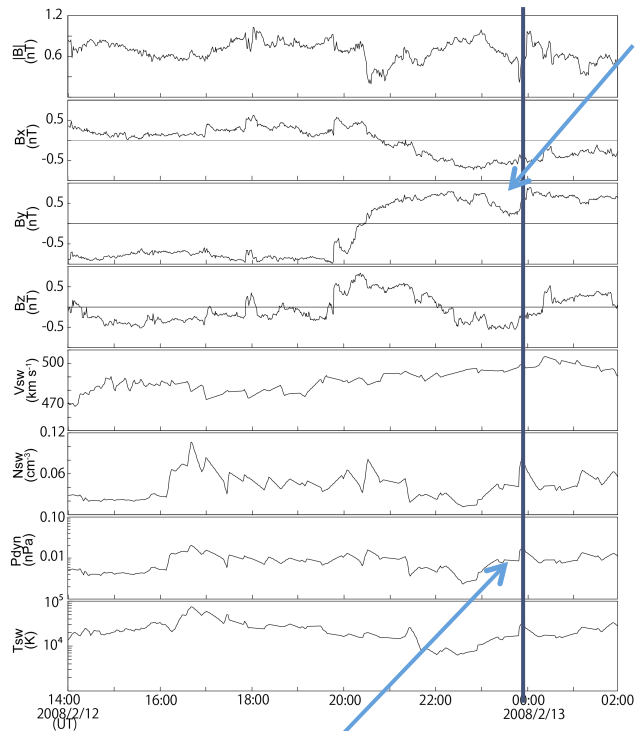
---

- Simulation and model results are scientific data appropriate for archiving
- Most fields and particles research has a simulation or model component
- Very important for planetary research since observations are sparse

## Challenges

- **Data volumes are B-I-G!**  
First, metadata pointing to data, then data
- **Information Model changes.**  
SPASE recently released an IM for simulations and models developed by the IMPEx group (U of Paris)  
This will be the starting point for the PDS4 additions

# Comparison of Simulation with Observations

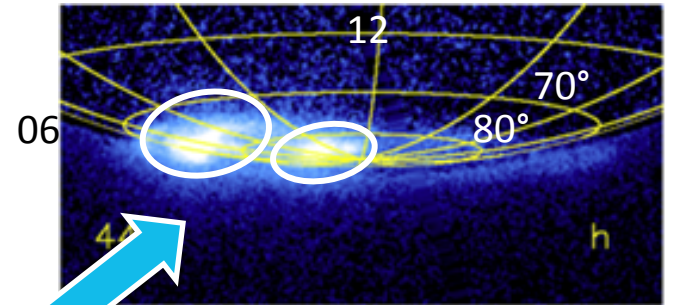


Enhancement in the dynamic pressure

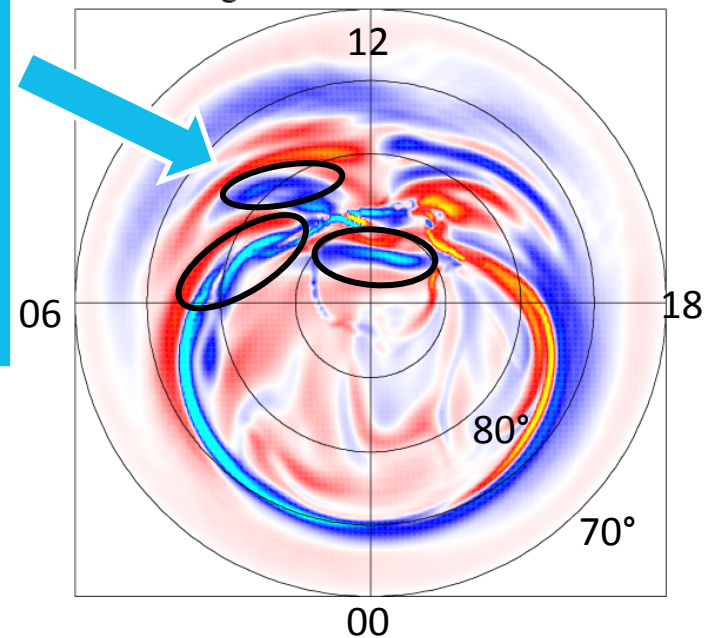
Enhancement of  $B_y$

Top – Observed aurora

Bottom – Upward FAC at the same time as the observations.



Field-Aligned Current



# DAP Projects

---

- Some DAP projects will have data to archive in PDS
- Smaller, many and low funding levels
- Current level of effort is similar to instrument team on Missions

\*\*\*\*

- Need to optimize process to keep it manageable
- What might help:
  - PDS4 and supported tools
  - OLAF (PSI) – Need PDS4 version
  - igpp.docgen (Velocity template to generate labels)

# Big Data Management (mimic)

---

- Data volumes (bytes) large compared to bandwidth (bus and network)
  - It takes too long to do blind copies.
- Optimize and Simplify synchronization of copies
  - Tried bbcp, rsync, rcp – mixed results
- Mimic – a tool tailored for big data archives.
  - **check** - Verify consistency of a Mimic managed collection
  - **clone** - Clone another Mimic managed collection
  - **pull** - Pull content from another Mimic managed archive
  - **push** - Push content to another Mimic managed archive
  - **refresh** - Update a Mimic managed collection

For archive and users (more later)



# What's New (Software)

---

## Outline

- User support (mimic, visualization, formats)
- Software Archive
- Open Source (GitHub, Gitlab)
- Extensive security audits (OpenSCAP)
- Docker deployment (Private Registry)

# User Support

---

- Big Data access (mimic and cloud)
  - Optimized downloads, store in the cloud (S3, Google)
- More Data Formats
  - IDL, MATLAB, Python (already Native, CSV, VOTable, JSON)
- Mission Pages
  - Data from all nodes on one page.
- “Related To” links
  - Provide links to related items (coincident in time or space)
- Visualization
  - Improved graphics (Autoplot, Topcat, VISTA)

# Software Archive

---

- Archive of software used for the creation or analysis of planetary data sets.
- Preserve software, documentation, regression tests, executables
- Pre-configured execution environments (system images)
  - Docker images and Dockerfile

## First Steps

- Determine needs and design information model additions.
  - Work with experts at Cornell and Carnegie Mellon
  - <https://olivearchive.org/>

# Open Source

---

Open Source for collaborative development and sharing

## **Github**

- Widely used, well established
- NASA uses it (NASA Tournament Lab)
- Possible issues if content is ITAR sensitive
- Free for public projects, charges for private repositories

## **Gitlab**

- A self-hosted git repository manager with code reviews, issue tracking, wikis and much more.
- Repositories can be private or public.
- Free

# Security Audits

---

## Buzz words

USGCB - United States Government Configuration Baseline (<http://usgcb.nist.gov/>)

SCAP - Security Content Automation Protocol (<http://scap.nist.gov>)

OVAL - Open Vulnerability and Assessment Language (<http://oval.mitre.org/>)

XCCDF - Extensible Configuration Checklist Description Format (<http://scap.nist.gov/specifications/xccdf/>)

\*\*\*\*

- External testing (with OpenSCAP??)
  - Inside the intranet (subnet)
  - Internet (world)
  - Offensive (proactive) security testing
- Internal Testing (OpenSCAP - <http://www.open-scap.org/>)
  - Inside the system
- Security Audit Reports
  - Submit with monthly reports?

XCCDF Test Result

file:///C:/Users/tking/Box Sync/audit/results-v4.html

Google Google News Business RCP RealClearPolitics StockCharts IGPP Jira

# XCCDF Test Result

## Introduction

---

### Test Result

Result ID	Profile	Start time	End time	Benchmark	Benchmark version
xccdf_org.open-scap_testresult_xccdf_ubuntu_profile_default	xccdf_ubuntu_profile_default	2015-09-25 12:23	2015-09-25 12:24	embedded	0.01

### Target info

Targets	Addresses	Platforms
<ul style="list-style-type: none"> <li>dev</li> </ul>	<ul style="list-style-type: none"> <li>127.0.0.1</li> <li>128.97.68.41</li> <li>172.17.42.1</li> </ul>	<ul style="list-style-type: none"> <li>cpe:/o:ubuntu-trusty:linux</li> </ul>

---

### Score

system	score	max	%	bar
urn:xccdf:scoring:default	73.13	100.00	73.13%	<div style="width: 73.13%; background-color: green;"></div> <div style="width: 26.87%; background-color: red;"></div>
urn:xccdf:scoring:flat	72.00	94.00	76.60%	<div style="width: 76.60%; background-color: green;"></div> <div style="width: 23.40%; background-color: red;"></div>
urn:xccdf:scoring:flat-unweighted	72.00	94.00	76.60%	<div style="width: 76.60%; background-color: green;"></div> <div style="width: 23.40%; background-color: red;"></div>

## Results overview

---

RESULTS OVERVIEW

Rule Results Summary

pass	fixed	fail	error	not selected	not checked	not applicable	informational	unknown	total
72	0	19	0	5	1	0	0	3	100

Title	Result
<a href="#">Add nodev Option to Non-Root Local Partitions</a>	unknown
<a href="#">Add nodev Option to Removable Media Partitions</a>	fail
<a href="#">Add noexec Option to Removable Media Partitions</a>	fail
<a href="#">Add nosuid Option to Removable Media Partitions</a>	fail
<a href="#">Add nodev Option to /tmp</a>	fail
<a href="#">Add noexec Option to /tmp</a>	fail
<a href="#">Add nosuid Option to /tmp</a>	fail
<a href="#">Add nodev Option to /dev/shm</a>	fail
<a href="#">Add noexec Option to /dev/shm</a>	fail
<a href="#">Add nosuid Option to /dev/shm</a>	fail
<a href="#">Bind Mount /var/tmp To /tmp</a>	fail
<a href="#">Disable Mounting of cramfs</a>	pass
<a href="#">Disable Mounting of freevxfs</a>	pass
<a href="#">Disable Mounting of jffs2</a>	pass
<a href="#">Disable Mounting of hfs</a>	pass
<a href="#">Disable Mounting of hfsplus</a>	pass
<a href="#">Disable Mounting of squashfs</a>	pass
<a href="#">Disable Mounting of udf</a>	pass
<a href="#">Verify User Who Owns shadow File</a>	pass
<a href="#">Verify User Who Owns group File</a>	pass
<a href="#">Verify Group Who Owns group File</a>	pass
<a href="#">Verify Permissions on group File</a>	pass
<a href="#">Verify User Who Owns gshadow File</a>	pass
<a href="#">Verify User Who Owns passwd File</a>	pass
<a href="#">Verify Group Who Owns passwd File</a>	pass
<a href="#">Verify Permissions on passwd File</a>	pass
<a href="#">Verify that Shared Library Files Have Restrictive Permissions</a>	pass
<a href="#">Verify that Shared Library Files Have Root Ownership</a>	pass
<a href="#">Verify that System Executables Have Restrictive Permissions</a>	pass
<a href="#">Verify that System Executables Have Root Ownership</a>	pass
<a href="#">Verify that All World-Writable Directories Have Sticky Bits Set</a>	pass

## Result for Disable Kernel Parameter for Accepting ICMP Redirects for All Interfaces

Result: **pass**

Rule ID: **xccdf\_org.ssgproject.content\_rule\_sysctl\_net\_ipv4\_conf\_all\_accept\_redirects**

Time: **2015-09-25 12:24**

Severity: **medium**

To set the runtime status of the `net.ipv4.conf.all.accept_redirects` kernel parameter, run the following command:

```
# sysctl -w net.ipv4.conf.all.accept_redirects=0
```

If this is not the system's default value, add the following line to `/etc/sysctl.conf`:

```
net.ipv4.conf.all.accept_redirects = 0
```

Accepting ICMP redirects has few legitimate uses. It should be disabled unless it is absolutely required.

### Security identifiers

- CCE-27027-2

### Remediation script

```
#
# Set runtime for net.ipv4.conf.all.accept_redirects
#
sysctl -q -n -w net.ipv4.conf.all.accept_redirects=0

#
# If net.ipv4.conf.all.accept_redirects present in /etc/sysctl.conf, change value to "0"
#   else, add "net.ipv4.conf.all.accept_redirects = 0" to /etc/sysctl.conf
#
if grep --silent ^net.ipv4.conf.all.accept_redirects /etc/sysctl.conf ; then
    sed -i 's/^net.ipv4.conf.all.accept_redirects.*net.ipv4.conf.all.accept_redirects = 0/g' /etc/sysctl.conf
else
    echo "" >> /etc/sysctl.conf
    echo "# Set net.ipv4.conf.all.accept_redirects to 0 per security requirements" >> /etc/sysctl.conf
    echo "net.ipv4.conf.all.accept_redirects = 0" >> /etc/sysctl.conf
fi
```

[results overview](#)



# Docker Deployment

---

- Docker provides application portability and infrastructure flexibility.
- Docker images are application packages that include dependencies and configurations.
- Docker images are stored in a registry
  - or built with a Dockerfile (make file for system images).
- We maintain a private registry we can make available to others.

# Data Archiving Plans

---

- We provide examples and help write plans.
- Worked well for missions, won't work as well with individuals (DAP proposers).
  
- We like what SBN has done  
[http://sbndev.astro.umd.edu/wiki/ROSES\\_Data\\_Managment\\_Plan\\_Tips](http://sbndev.astro.umd.edu/wiki/ROSES_Data_Managment_Plan_Tips)  
and here (needs upgrade to PDS4)  
<http://sbn.pds.nasa.gov/howto/prepare.shtml>
- And what Imaging (ICN) has done  
<http://pds-imaging.jpl.nasa.gov/help/proposals.html>

We Need to

- Add Data Archive Plan templates to help and guide.
- Have great user guides for tools.

# Potential issues - Over the next 24 months.

---

- Security Testing
  - More thorough and more often
- Open Source
  - Tension between NASA Center rules and desires
- Information Model updates
  - Timeliness to support new data types and sources
  - Versioning and backward compatibility (and its impact on validation)
  - Software support

# Sub-node Issues

---

- None

# Mission Issues

---

- MAVEN working well and improving
  - Archiving was a level 1 requirement
  - Dedicated P.I., fully committed to archiving
  - Process and expectations are more aligned with archiving
- InSight
  - PDS4 – new data types
- Juno
  - PDS3 mission – maintenance of PDS3 IM and tools
  - Nominal mission through 2018
  - Plan to build PDS4 migration into pipeline