

## Projects

E. Rasche

### Completed

Monit/Infra  
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Galaxy Project  
Performance  
Cloud  
Security

### Ongoing

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# My projects

E. Rasche

2017-11-09T08:00:00Z



# Completed Projects

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## *New UFR Service*

- Telegraf → InfluxDB → Grafana
- Open metrics / statistics
- Sharing dashboards with Galaxy project
- <https://grafana.denbi.uni-freiburg.de>

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## *New UFR Service*

- Collects application exceptions
- Galaxy: stack traces, `log.warn`, `log.error`, `log.exception`
- Galaxy Frontend: javascript exceptions + browser info + user identity
- Helps catch + fix bugs!



Chrome  
Version: 61.0.3163



Windows 7  
Version: Unknown

TAGS

browser Chrome 61.0.3163 browser.name Chrome level error logger javascript os.name Windows 7

transaction /static/scripts/bundled/libs.bundled.js in n. iframeChangeHandler

url https://galaxy.uni-freiburg.de/root user email:daria.onichtchouk@biologie.uni-freiburg.de

EXCEPTION (most recent call first)

Full Raw

SecurityError

Blocked a frame with origin "https://galaxy.uni-freiburg.de" from accessing a cross-origin frame.

- /static/scripts/bundled/libs.bundled.js in n.iframeChangeHandler at line 28:4931
- /static/scripts/bundled/libs.bundled.js in HTMLIFrameElement.dispatch at line 25:3616
- /static/scripts/bundled/libs.bundled.js in HTMLIFrameElement.m.handle at line 25:318
- /static/scripts/libs/raven.js in HTMLIFrameElement.d at line 1:4788

BREADCRUMBS

Search breadcrumbs...

- Show 8 collapsed crumbs
- ui.click div.header > div.buttons > a#history-refresh-button > span.fa.fa-refresh 16:59:18
  - ui.click div.header > div.buttons > a#history-refresh-button > span.fa.fa-refresh 16:59:18
  - ui.click div.header > div.buttons > a#history-options-button > span.fa.fa-cog 16:59:18

FIRST SEEN

When: 2 days ago  
October 30 2017 16:59:45 UTC

Release: not configured

LAST SEEN

When: 2 days ago  
October 30 2017 16:59:45 UTC

Release: not configured

Tags

- browser 100% Chrome 61.0.3163
- browser.name 100% Chrome
- level 100% error
- logger 100% javascript
- os.name 100% Windows 7
- transaction 100% /static/scripts/bundle...
- url 100% https://galaxy.uni-frei...
- user 100% [redacted]@bi...

Notifications

MESSAGE

Failed to cleanup MetadataTempFile temp files from /data/dnb01/galaxy\_db/job\_working\_directory/002/021/2021719/metadata\_out\_HistoryDatasetAssociation\_4685734\_IdczeA: No JSON object could be decoded

EXCEPTION (most recent call first)

Full

Raw

**ValueError**

No JSON object could be decoded

json/decoder.py in raw\_decode at line 384

379.

380. """

381. try:

382. obj, end = self.scan\_once(s, idx)

383. except StopIteration:

384. raise ValueError("No JSON object could be decoded")

385. return obj, end

idx

0

s

' '

self

<json.decoder.JSONDecoder object at 0x195fcd0>

json/decoder.py in decode at line 366

+

json/\_init\_\_.py in loads at line 326

+

json/\_init\_\_.py in load at line 278

+

galaxy/model/metadata.py in cleanup\_from\_JSON\_dict\_filename at line 668

+

LAST 30 DAYS

FIRST SEEN

When:

2 months ago

September 12 2017 18:00:07 UTC

Release:

not configured

LAST SEEN

When:

2 days ago

October 30 2017 14:40:10 UTC

Release:

not configured

Tags

level

100% error

logger

100% galaxy.model.metada...

server\_name

100% cn029.bi.uni-freiburg...

1 Participant

Notifications

You're receiving updates because you have changed the status of this issue.

Unsubscribe

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## *New UFR Service*

- Like **Travis-CI** but different
- Runs in the bwCloud
- Useful if:
  - Jobs need to run really long
  - Code is extremely private/sensitive
  - Jobs produce artifacts that must be stored and available to download (e.g. PDF for course slides)

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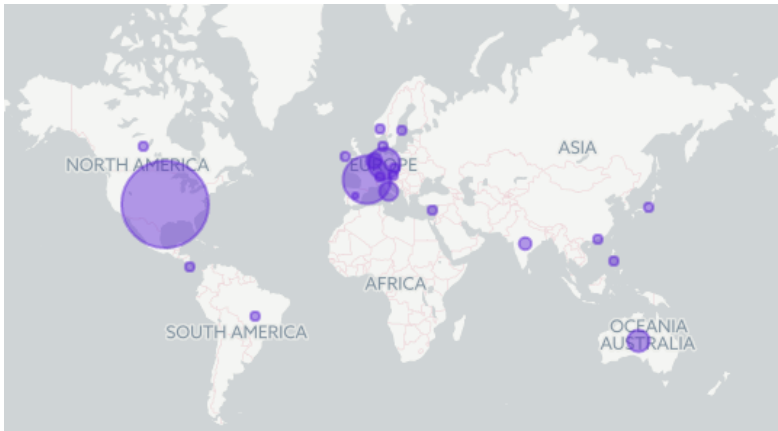
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- CSV file of public galaxy servers
- Simple script to contact server + record configuration
- Uptime badges! uptime 92.24%
- Cool maps!





# Galactic Radio Telescope

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- Part of Galaxy 17.09
- Efficiently collects basic metrics (job, state, runtime, input sizes) from participating Galaxies
- A later update will add more metrics
- Currently collecting from UFR Galaxy
- <https://telescope.galaxyproject.org>

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- Job configuration migrated from XML to python
- Job conf now under testing (Jenkins)
- Enables dynamically choosing where to send jobs
- Highlighted use case: Training-as-a-Service. Users in specific roles can be directed to dedicated VMs.

# Upload + Metadata VMs

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- Leverages our bwCloud Condor Cluster
- “Upload” VMs only handle upload jobs, “metadata” VMs are similar.
- All uncompression of uploaded files is done off of cn029
- *Fewer random slow downs*

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- pykwalify is great
- Use it.

```
---
type: map
mapping:
  "=":
    type: map
    mapping:
      "name":
        type: str
      "tmp":
        type: str
        enum: ["large"]
      "cores":
        type: int
      "mem":
        type: int
      "runner":
        type: str
        enum: ["condor", "sge"]
      "env":
        type: map
        mapping:
          "=":
            type: text
      "nativeSpecExtra":
        type: str
      "priority":
        type: int
        range:
          min: 0
```

# Bug Reporting Plugins

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- Bug reporting as “plugins”
- Plugins for: email, sentry, GitHub, influxdb, logfile
- Easy to develop new ones
- Control over automated submission without user interaction (e.g. sentry vs email)
- [galaxyproject/galaxy#4305](https://github.com/galaxyproject/galaxy/issues/4305)

# Ansibilization of Galaxy Configuration

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- Major Galaxy configuration files now as some custom playbooks
- Not the entirety of galaxy
- Playbooks automatically run every hour
- GitHub enables reviewing + “auditing” of configuration changes
- *Nearly* no more SSHing

# Bigger Click Targets

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- [galaxyproject/galaxy#4470](#)
- I hate small click targets
- Be the change you want to see in the world

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- *Zero-downtime restarts of Galaxy*
- Configuration worked out by Nate Coraor (@natefoo)
- It is super effective!
- We annotate the restart events in Grafana if you are curious when it happens



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- Pre-configure Condor Master + Executor VM images
- Converted existing playbooks to reusable roles
- Integrated work from RZ for simplified build process
- Now regularly building + deploying images

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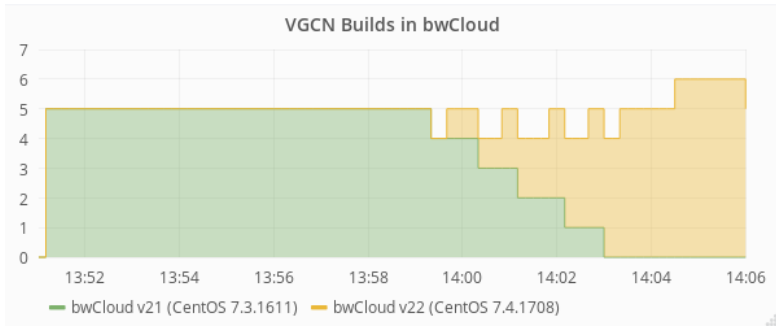
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- Regularly deploying new images sucked
- Rolling restarts are necessary
- Infrastructure-as-code (e.g. Terraform/CloudFormation/Heat)



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- Temporary maintainer
- Full time employee replaces me (yay!)
- No major improvements made, some networking issues triaged and bandaids applied around libvirt

# Galaxy subprocess hardening

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- [galaxyproject/galaxy#4604](#)

- **BAD**

```
subprocess.call("ls /some/path", shell=True)
```

- **GOOD**

```
subprocess.call(["ls", "/some/path"])
```

- Missed some :(

# Reaching the promised LAN

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- [galaxyproject/galaxy#4289](https://galaxyproject.org/galaxy#4289)
- Galaxy's upload lets you paste in URLs
- Even URLs inside your super secure network  
(e.g. `http://192.168.0.1:8080`)
- Galaxy can be used to probe infrastructure and possibly  
download restricted material
- Now administrators must whitelist local network resources  
which should be accessible.



# Security Repo for Galaxyproject

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- Tracking security issues in emails is not sensible
- We now have a git repo for this
- Testing setup is WIP



# Ongoing Projects

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## Done:

- Many uptime and performance enhancements in place
- Monitoring continues to help identify issues

## TODO:

- Logo
- Branding things (UFR downplayed, usegalaxy.eu everywhere)
- English and grammar checks of all written materials
- Terms of Service (SLA, SLO) + Privacy Policy
- Communications Materials
- User-facing mailing list, plan out mails



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## Background:

- We'll be deploying the Apollo Genome Browser alongside [usegalaxy.eu](http://usegalaxy.eu)
- Apollo has horrifying performance in some parts
- UI is miserable
- Underlying code is not easily fixed

## TODO:

- Working on splitting apart frontend + backend
- Collaborating with some other "big" apollo-galaxy sites

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## Background:

- Apollo is great for collaborative, real-time editing
- ... but it feels very lonely since you cannot communicate

## Done:

- Proof-of-concept implementation works OK

## TODO:

- Needs more authentication options
- Needs archiving / chat log database

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## Background:

- Increasing number services that become slowly critical
- SLAs? SLOs?

## Done:

- Ansible roles for deploying infrastructure (Grafana, InfluxDB, Sentry, public-galaxy-servers)

## TODO:

- SLO: *Must* be able to be redeployed quickly ( $<10$  min)
- Backups

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## Background:

- “New” job conf is nice
- But can only be reconfigured by restarting handlers and waiting 5 min to 10 min

## TODO:

- Force it into a secondary process which can be re-deployed with zero downtime
- Need to choose a method + test (unix sockets, load balanced web service, `SO_REUSEPORT`, etc.)
- SLO:  $\leq \frac{1}{100.000}$  jobs dropped in networked version of the job destination service

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- Jenkins is now building NGS\_lectures as an example
- “Reference” build platform, everyone can compare results to it (especially for people with custom  $\text{\LaTeX}$  styles)
- Can serve + archive PDFs (forever?)
- Need to define artefact retention policy
- Need to apply to more projects

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## Background:

- Too many tools in the toolbox
- Too few are relevant to specific users
- With user toolbox filters users can “build” their own toolbox

## TODO:

- Currently broken, will be fixed real soon now™

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## Background:

- (Re)discovered script `pglite`
- Will provide *real* PostgreSQL databases during tool execution
- Useful for cheminformatics + genome annotation

## Done:

- First set of tools being built
- Datatypes in Galaxy

## TODO:

- GMOD tool suite
- chado-schema-builder brought back to life

# Mirroring Galaxy Repos

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## Background:

- Some devs worry: “What if GitHub goes away?”
- Plan is to mirror all of galaxyproject’s repos

## Done:

- Simple mirror of Galaxy codebase

## TODO:

- Mirror all other repos
- Update mirrors regularly (i.e. Jenkins job)
- Recently discovered `git-appraise`. Should permit archiving PRs + discussion (+ issues?) all within portable git repo.



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- Adding Elixir AAI authentication to deNBI Cloud @ Freiburg
- Unlike any other cloud, so we have special issues
- :(

# Automating VGCN Image Building

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## Background:

- Building VGCN images by hand is time consuming
- Builds are quite reliable, unlikely to produce a broken VM
- So let's make Jenkins build them on VGCN playbook changes

## TODO:

- Builds in bwCloud time out when Jenkins runs them
- But they'll build fine in SJ's "imager" cloud VM
- ???

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## Background:

- CSP helps prevent huge swaths of security issues
- Can prevent browsers from executing unexpected scripts, CSS, media, frames, etc.

## Done:

- Currently in “reporting” mode, collecting any infractions

## TODO:

- Need to analyze infractions, identify real issues (vs noise)
- Need to cleanup galaxy, removing inlined styles, scripts
- Will move to “enforcing” mode after issues are patched

# Cron jobs logged to Jenkins

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## Background:

- Ansibilization lets us discover all manner of hidden jobs
- Let's push the logs to a central location for auditing
- Jenkins can “monitor” external jobs
- Public visibility  $\Rightarrow$  forced accountability

## Done:

- All cron tasks from galaxy@cn029

## TODO:

- Identify cron jobs on other hosts, VMs, etc.



# Upcoming Projects

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Still in planning phase

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Question: What is in the GRT data?

Proposed Solution:

- Deploy Jupyter / an web-based SQL query suite with access to GRT data.
- No real plan for making it useful, but it'd be shiny
- Want to encourage analysis of public GRT data

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Question: Is Galaxy working as expected?

Proposed Solution:

- Regular, automated testing of our Galaxy installation
- Commonly executed workflows will give good idea
- Can cover jobs going to condor + sge + odd configuration we might have

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Question: Why is everything still slow?

Proposed Solution:

- Upload jobs should be timed (time to upload, job execution, green history element)
- More job timings available in the database
- Need to track all of this
- In general, are things getting better or worse for users?
- Is user-facing infra more or less reliable?



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Question: How can we keep Galaxy from re-building the same tools, the same JSON blobs *ad nauseam*?

Proposed Solution:

- Provide a generic interface in codebase for caching data
- Provide methods for expiring the cache as needed
- Will support in-memory, on-disk, and networked caches (memcached)
- Will convert subset of slow computations to use new cache

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E. Rasche

### Completed

Monit/Infra  
Freiburg Galaxy  
Galaxy Project  
Performance  
Cloud  
Security

### Ongoing

FR Galaxy  
Galaxy Project  
Performance  
Cloud  
Security

### Upcoming

Monitoring  
Freiburg Galaxy  
Galaxy Project  
Performance  
Cloud  
Security

Question: How can I grant partial access to my account to a third party without violating every security policy ever?

Proposed Solution:

- Implement *OAuth2* over the Galaxy API
- API keys with *scopes* that can be granted
- Third parties can build things on top of Galaxy, new UIs, new (limited) tools
- Users feel safe granting privileges

# User Generated Content

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Question: How can admins be 100% absolutely sure that user generated content is safe?

Proposed Solution:

- Host user-content on a second domain (i.e. HTML render of datasets)
- Just like GitHub ([githubusercontent.com](https://githubusercontent.com))
- Will allow us to ignore / disable whitelisting of “safe” tools
- Token-based access to datasets instead of cookie-based

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Question: How can we securely store user-supplied secrets in the safest way possible?

Proposed Solution:

- Galaxy should not be responsible for storing super secret secrets (e.g. API keys to third party services)
- Hashicorp's Secrets Server is *literally built for this and only this*
- Integration paves way for tools with easier access to remote services (i.e. Apollo suite)

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Question: How can users with extreme data security requirements use Galaxy?

## Proposed Solution:

- Allow users to mark datasets, libraries, entire histories as “secure”
- Any datasets produced from these are also tagged “secure” and treated accordingly.
- For datasets marked as “secure”:
  - Must securely wipe (DoD standard 32-pass) datasets and temporary files
  - Data must be encrypted in transit + at rest (requires Secrets Server)