



SURF

Yoda Auditing and Statistics

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| SURF Yoda Service



Yoda is SURF's research data management platform, built on iRODS.

Yoda helps researchers:

- Store research data securely
- Share data with collaborators
- Control access and permissions
- Manage metadata and provenance
- Preserve data for the long term

SURF



| Auditing

Compliance

Mandated by ISO27002 to support a high level of confidentiality and integrity

Usage statistics

Reporting who has done what when

Observability

Incident Investigation
Verifying malicious attacks and data leaks

We must ensure that our services remain secure, trustworthy, and compliant with institutional and regulatory requirements.

| Statistics

01

Upload

02

Download

04

Copy

03

Delete

05

Login

KU Leuven's Auditing Approach with Debezium

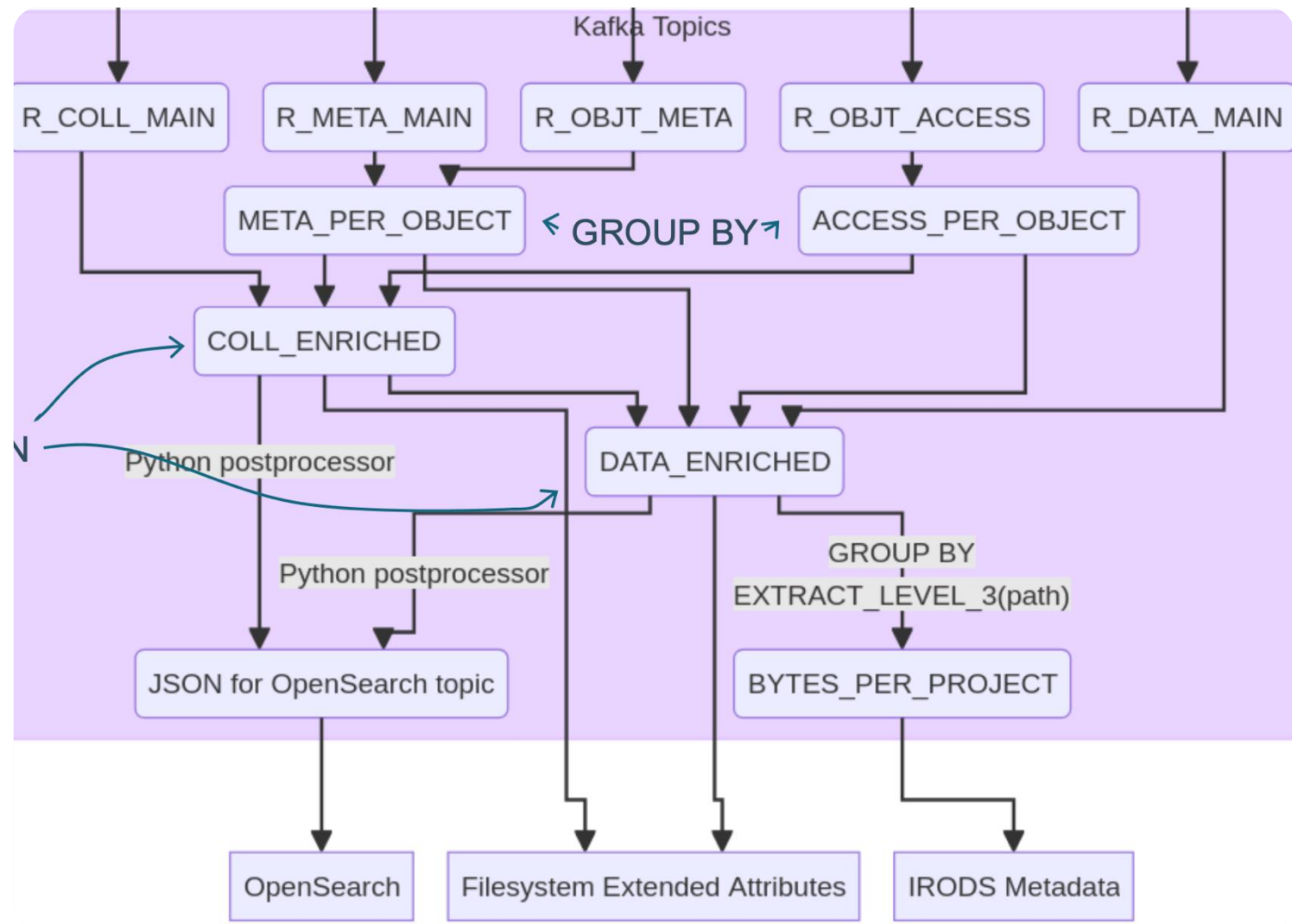
Complexity:

Complex, all the details should be reverse engineered.

Untraceable Actions:

Deleting objects didn't register who has deleted the files.

Slides:



| iRODS Audit Plugin

Captures important events and user actions within iRODS as they happen.

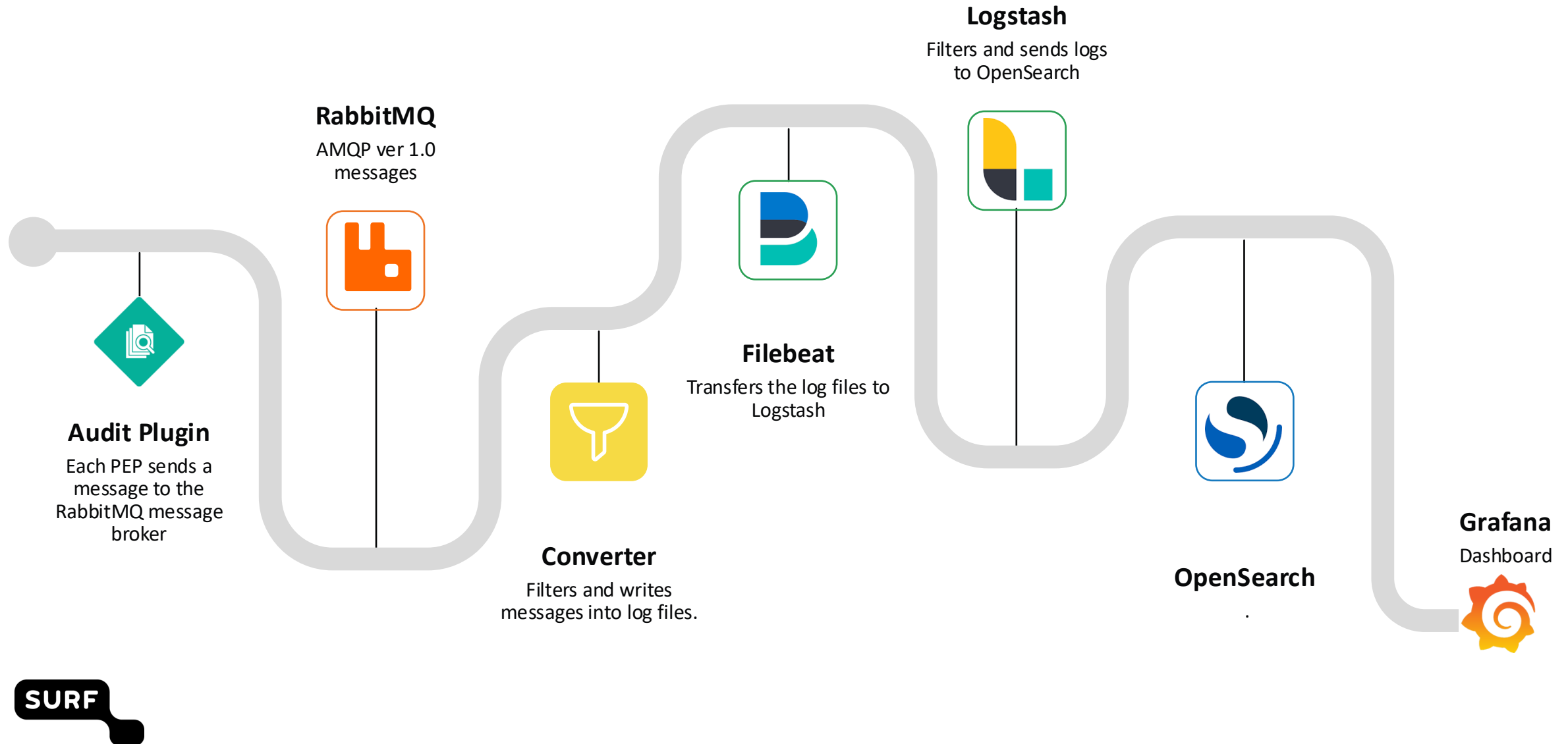
Does not capture "actions", but events associated to policy enforcement points (PEPs)

Provides structured audit records for operations such as data access, metadata changes, and administrative activities.

These are a very fine-grained set of events happening for any action, more than 160,

API_NUMBER(DATA_OBJ_CREATE_AN,	601)
API_NUMBER(DATA_OBJ_OPEN_AN,	602)
API_NUMBER(DATA_OBJ_PUT_AN,	606)
API_NUMBER(DATA_PUT_AN,	607)
API_NUMBER(DATA_OBJ_GET_AN,	608)
API_NUMBER(DATA_GET_AN,	609)
API_NUMBER(DATA_COPY_AN,	611)

| Yoda Auditing Architecture



iRODS Policy Plugin



input

RPC API

```
audit_peg_auth_agent_auth_request_post
audit_peg_auth_agent_auth_request_pre
audit_peg_auth_agent_auth_response_post
audit_peg_auth_agent_auth_response_pre
audit_peg_auth_agent_start_post
audit_peg_auth_agent_start_pre
audit_peg_auth_request_post
audit_peg_auth_request_pre
audit_peg_auth_response_post
audit_peg_auth_response_pre
audit_peg_data_obj_put_post
audit_peg_data_obj_put_pre
audit_peg_database_check_auth_post
audit_peg_database_check_auth_pre
audit_peg_database_close_post
audit_peg_database_close_pre
audit_peg_database_gen_query_access_control_setup_post
audit_peg_database_gen_query_access_control_setup_pre
audit_peg_database_gen_query_post
audit_peg_database_gen_query_pre
audit_peg_database_get_rcs_post
audit_peg_database_get_rcs_pre
audit_peg_database_mod_data_obj_meta_post
audit_peg_database_mod_data_obj_meta_pre
audit_peg_database_open_post
audit_peg_database_open_pre
audit_peg_database_reg_data_obj_post
audit_peg_database_reg_data_obj_pre
audit_peg_exec_microservice_post
audit_peg_exec_microservice_pre
audit_peg_exec_rule_post
audit_peg_exec_rule_pre
audit_peg_network_agent_start_post
audit_peg_network_agent_start_pre
audit_peg_network_agent_stop_post
audit_peg_network_agent_stop_pre
audit_peg_network_read_body_post
audit_peg_network_read_body_pre
audit_peg_network_read_header_post
audit_peg_network_read_header_pre
audit_peg_network_write_body_post
audit_peg_network_write_body_pre
audit_peg_network_write_header_post
audit_peg_network_write_header_pre
audit_peg_obj_stat_post
audit_peg_obj_stat_pre
audit_peg_resource_close_post
audit_peg_resource_close_pre
audit_peg_resource_create_post
audit_peg_resource_create_pre
audit_peg_resource_modified_post
audit_peg_resource_modified_pre
audit_peg_resource_registered_post
audit_peg_resource_registered_pre
audit_peg_resource_resolve_hierarchy_post
audit_peg_resource_resolve_hierarchy_pre
audit_peg_resource_stat_post
audit_peg_resource_stat_pre
audit_peg_resource_write_post
audit_peg_resource_write_pre
```

EVENT HANDLERS

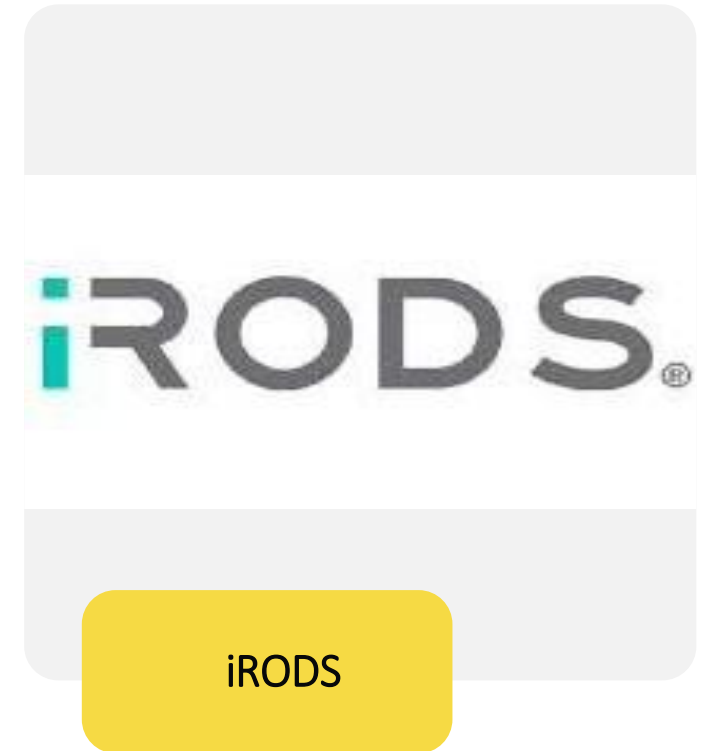
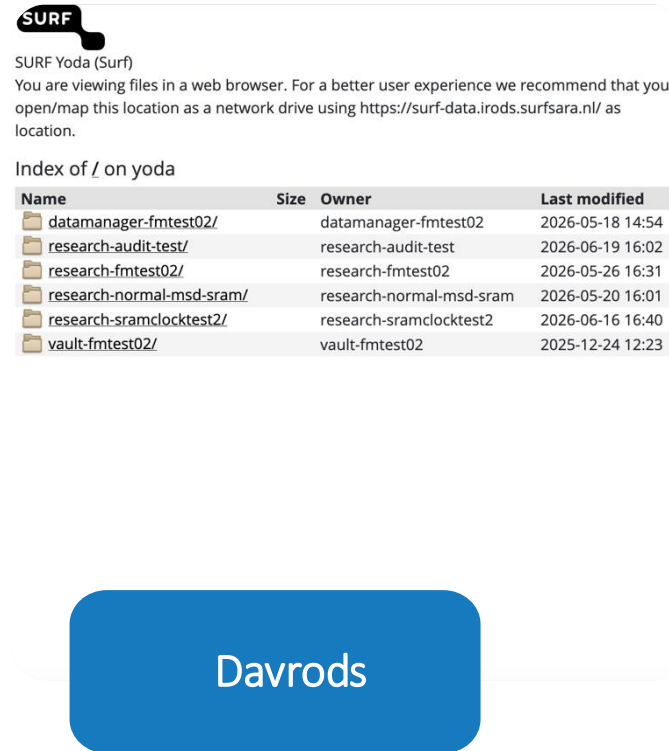
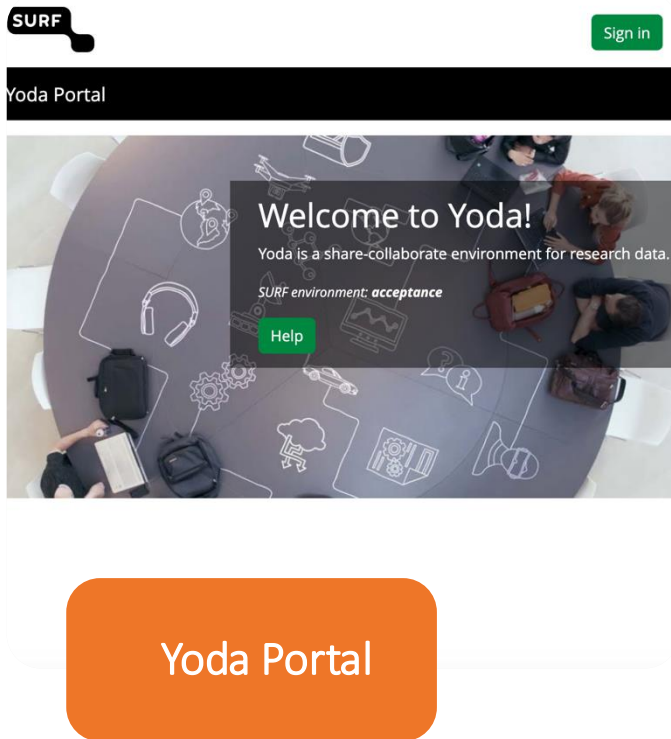
Create
Write
Read
Replication
Unlink
Rename
Register

POLICY INVOCATIONS

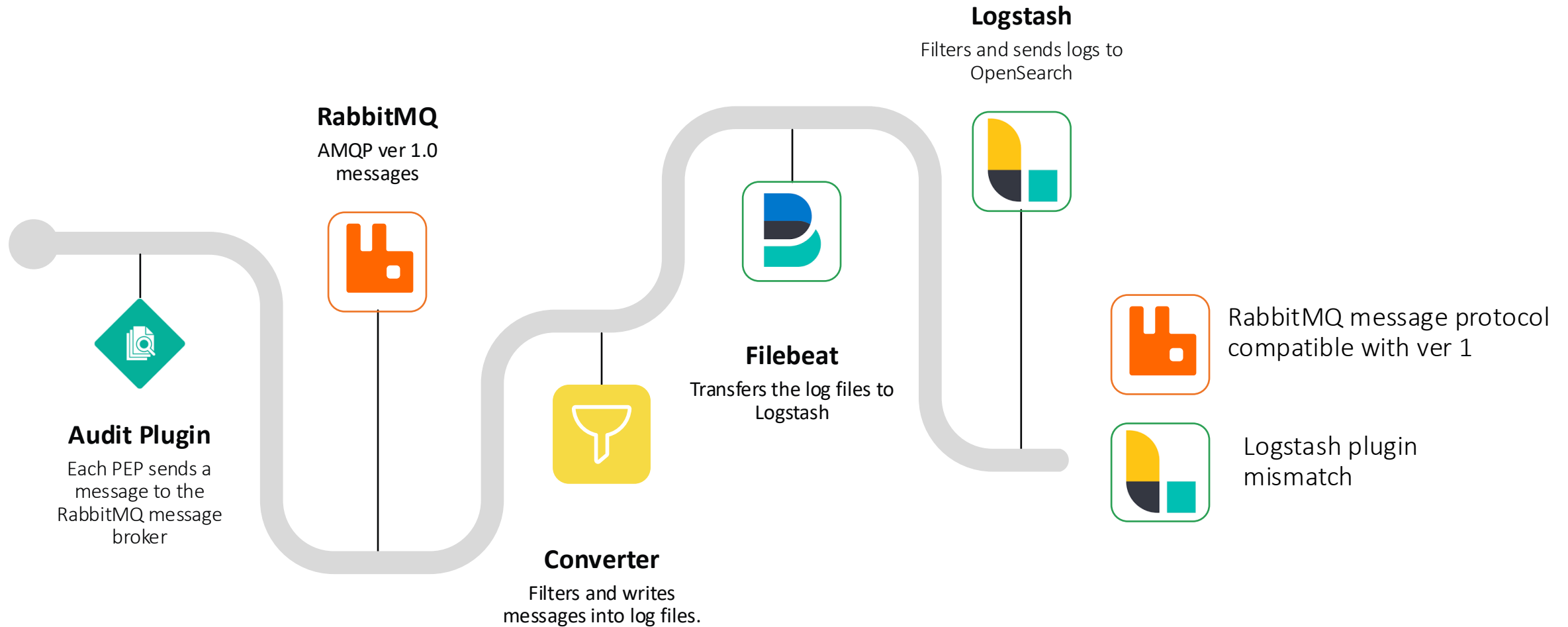
iRODS_Policy_Example

| Yoda and Audit

Upload



| Yoda Auditing Architecture



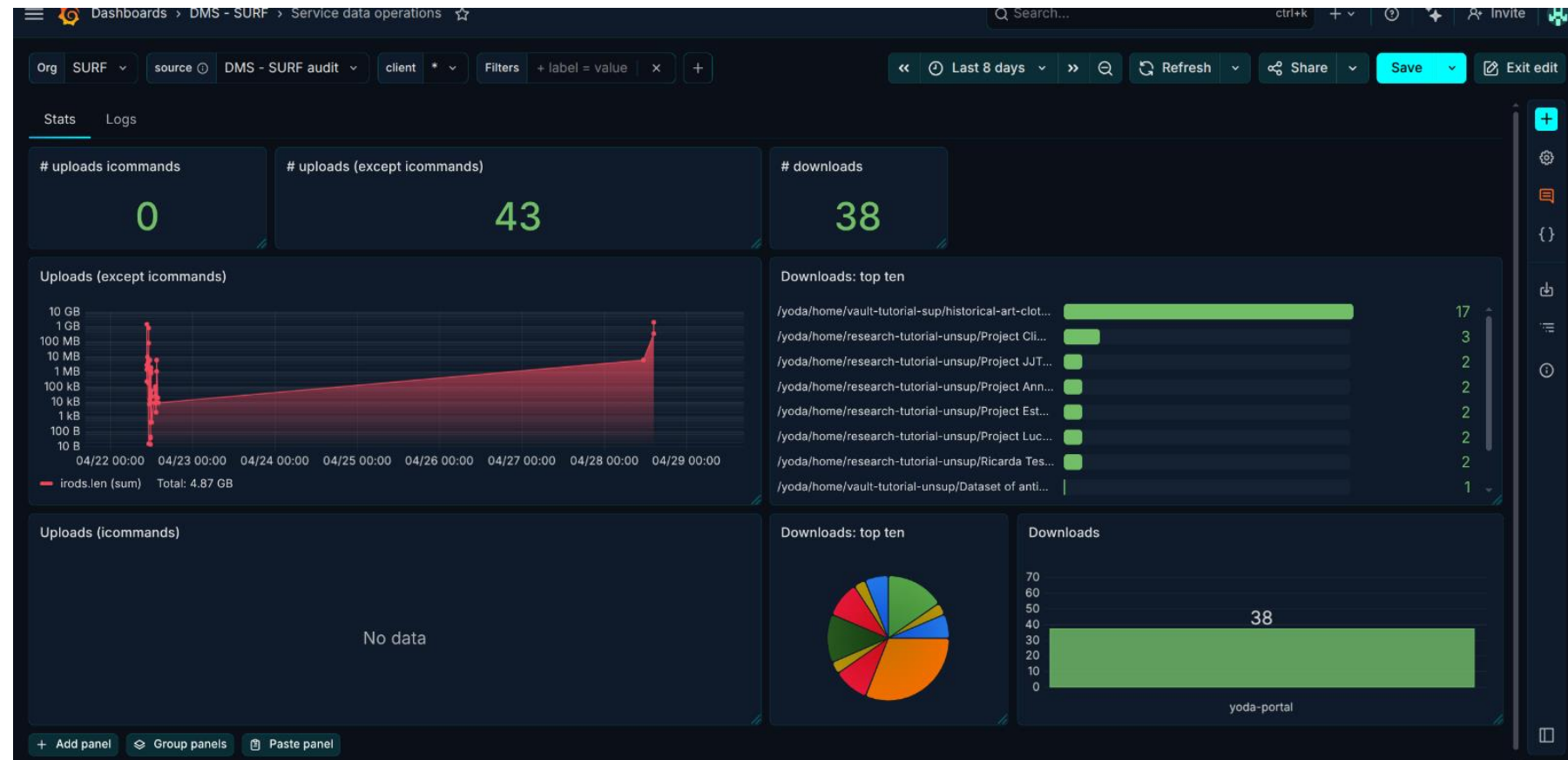
Grafana Statistics

a combination of messages together
will be called one action

Aggregating messages with the same
timestamp

Information scattered in multiple
messages.

There are different ways to upload or
download



| Future work

- Capturing more actions
- Improving performance
- Making use of policy plugin

