

Managing Archiver Rules for Individual EPICS PVs in FRIB's Diagnostics System

Bruno Martins, Scott Cogan, Steve Lidia, Diego Omitto
martins@frib.msu.edu

Facility for Rare Isotope Beams (FRIB), Michigan State University, East Lansing, MI 48824 USA

Motivation

- There are different types of diagnostics devices.
- The same readout card can be used for different device types.
- Each type of diagnostics device has a different desired Archiver policy.
 - For example, different channels of the same Pico8 card can be connected to a Faraday Cup and a Halo Monitor Ring, which have different Archiver policies.
- **Archiver Appliance** rules are created and enforced at runtime based on *info* tags associated with each PV by an independent agent called **PV Auto Provisioner**.
- Therefore, there's a need for assigning *info* tags in an IOC on a *per-PV* basis (as opposed to *per-Record*).

Centrally Managing Archiver Tags

- The creation of the *info* tags for the **PV Auto Provisioner** happens in the IOC itself, via **retools** functions.
- A tool was created to centrally manage the *info* tags for all IOCs, **IOC Manager**, which
 - Collects existing PVs from diagnostics IOCs when they are built in **Jenkins**.
 - Allows its users to create and modify tags, displaying their coverage in real time.
 - Automatically opens pull requests on **Stash** to update the tags of a specific IOC, when requested by the user.

Pattern	Description	Config (Hz)	# Base Records
<input type="checkbox"/> ^.*:EVTL_RD\$		monitor: 0.1, inf	24
<input type="checkbox"/> ^.*:EVTTHRES_CSET\$	Threshold Setpoint	monitor: 1, inf	24
<input type="checkbox"/> ^.*:EVT_RD\$		monitor: 1, 12mo	24
<input checked="" type="checkbox"/> ^.*:FLUX_RD\$		monitor: 1, inf	24

Figure 1: Archiver Tags in IOC Manager's Web Interface

Enforcing Archiver Rules at Runtime

- IOCs in production, upon start, publish their PV names and metadata to **Channel Finder**.
- The **PV Auto Provisioner** scans **Channel Finder** and looks for PVs that have *info* tags with key "archiver".
- The **PV Auto Provisioner**, then, ensures that the configuration it found in the *info* tag is correctly reflected in the **Archiver Appliance**.
- IOCs are automatically restarted by **Puppet** whenever there is a change in the production branch of their source code repository.

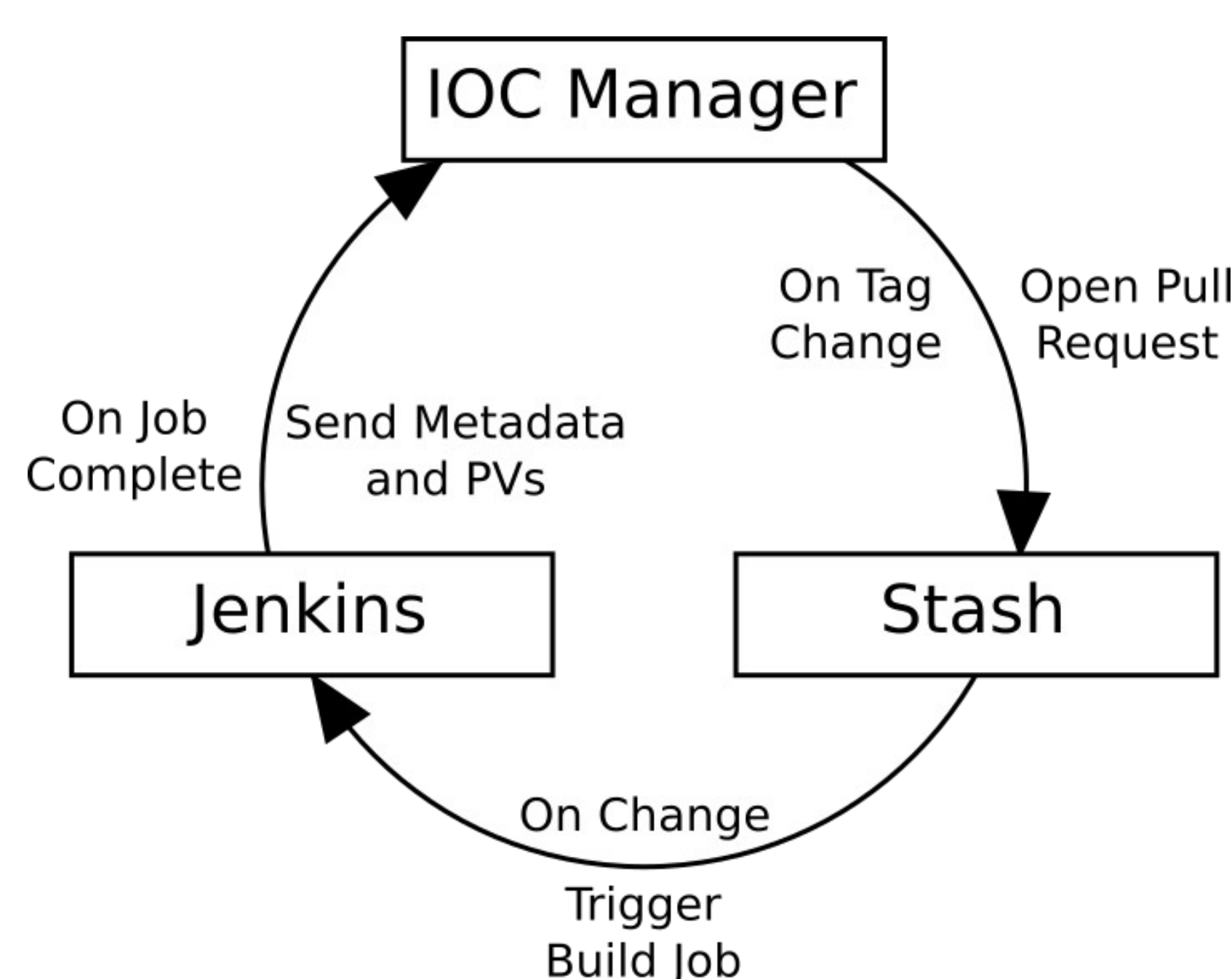


Figure 2: Archiver Rules Workflow

retools: creating regular-expression based aliases and *info* tags

```
reAddAlias "DIAG_MTCA01:PIC08_CH0:(.*)" "FE_LEBT:FC_D0796:$1"
```

For each PV that matches **PV prefix**, create an alias for it by replacing **PV prefix** with **alias prefix** while preserving the **suffix** as is.

```
reAddInfo ".*(FC|HMR|ND)_D.*:AVG_RD" "archive" "monitor:2.0,retention:3mo"
```

For each **Faraday Cup**, **Halo Monitor Ring** and **Neutron Detector** average reading PV, add an *info* tag with key "archive" and value "monitor:2.0,retention3mo", meaning that the PV should be sampled at most at 2Hz and retained in the archiver for 3 months.