



# The new container/helm configuration workflow

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# Rucio containers and helm charts

- **Maintained by the Rucio core team**
- **Allow to easily deploy a Rucio container or whole daemons/server infrastructure**
- **Wouldn't be very practical if not configurable**

# Running containers with custom configuration

- <https://rucio.cern.ch/documentation/installing-rucio-server#install-via-docker>

```
docker run \  
  --name=rucio-server \  
  -e RUCIO_CFG_DATABASE_DEFAULT="mysql+pymysql://rucio:rucio@host/rucio" \  
  -p 80:80 -d rucio/rucio-server
```



Jinja Generation :

<https://github.com/rucio/containers/blob/2f720da6ecfc8b0363b36948dc54c255a0f3762e/daemons/rucio.cfg.j2>

rucio.cfg:

[database]

default = mysql+pymysql://rucio:rucio@host/rucio

# Deployment via helm

```
conveyorTransferSubmitterCount: 1
image:
  repository: rucio/rucio-daemons
  tag: release-1.26.9
```

```
conveyorTransferSubmitter:
  activities: "'Test1' 'Test2'"
  sleepTime: 60
  threads: 1
  bulk: 10000
  resources:
    limits:
      memory: "500Mi"
      cpu: "1000m"
    requests:
      memory: "100Mi"
      cpu: "300m"
```

```
config:
  database:
    default: mysql+pymysql://rucio:rucio@host/rucio
  conveyor:
    transfertool: "fts3"
```

## Run 1 submitter

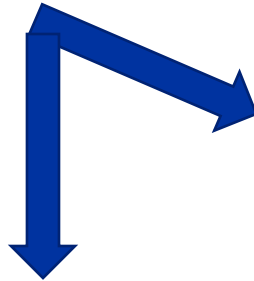
## Command-line arguments

## Kubernetes resource limits

## rucio.cfg

# The helm part of rucio.cfg generation

```
config:
  database:
    default: mysql+pymysql://rucio:rucio@host/rucio
  conveyor:
    transfertool: "fts3"
```



```
$ kubectl -n rucio get secret release-rucio-daemons.cfg -o yaml
apiVersion: v1
data:
  database_default: bXlzcWwrcHl0eXNxbDovL3J1Y2lvOnJ1Y2lvQGhvc3QvcnVjaW8K
  conveyor_transfertool: ZnRzMw==
```

```
$ kubectl -n rucio get pod release-conveyor-submitter-7878ffd79d-rq2hm -o yaml
kind: Pod
spec:
  containers:
  .....
```

- env:
  - name: RUCIO\_CFG\_DATABASE\_DEFAULT  
valueFrom:  
secretKeyRef:  
key: database\_default  
name: release-rucio-daemons.cfg
  - name: RUCIO\_CFG\_CONVEYOR\_TRANSFERTOOL

```
.....
```

# Motivation for changing the behavior

- **Un-needed complications if a value is not anticipated in .j2 template**
  - Containers built on releases: potentially weeks of waiting to be able to set a new config value
- **Impossible to set per-daemon values**
  - Was needed for our database optimization work (a common effort of ATLAS, CMS, and the DB team: <https://github.com/rucio/rucio/issues/4793> )

# New behavior in containers

- **Get rid of templates in containers. Substitute by a python script (<https://github.com/rucio/rucio/pull/4990>)**
  - can take multiple .cfg/.json files in input (more about this later)
  - can import ENV variables of format RUCIO\_CFG\_<SECTION>\_<OPTION>
  - exports the merged config to the given path

```
$ RUCIO_CFG_A_B=3 python3 ./merge_rucio_configs.py -s x.cfg y.json --use-env -d rucio.cfg
INFO:root:Merged 1 configuration values from x.cfg
INFO:root:Merged 1 configuration values from y.json
INFO:root:Merged 1 configuration values from ENV
```

<u>x.cfg</u>		<u>y.json</u>		ENV		<u>rucio.cfg</u>
[d]	+	{"a": {"b": 20}}	+		=	[a]
e=f						b = 3
						[d]
						e = f

# New behavior in helm

```
conveyorTransferSubmitter:
  activities: "'Test1' 'Test2'"
  sleepTime: 60
  threads: 1
  bulk: 10000
  config:
    database:
      pool_size: 10
config:
  database:
    default: mysql+pymysql://rucio:rucio@host/rucio
  conveyor:
    transfertool: "fts3"
```

## allow per-component configuration in helm

- **values.config** common for all daemons
- **values.daemonName.config** can update/override this config

```
$ kubectl -n rucio get secret release-rucio-daemons.config.conveyor-submitter -o yaml
kind: Secret
data:
  rucio.config.common.json: b64enc('{"database": {"default": "mysql+pymysql://rucio:rucio@host/rucio"},
                                     "conveyor": {"transfertool": "fts3"}}')
  rucio.config.component.json: b64enc('{"database": {"pool_size": 10}}')
```



# Current status and next steps

- **Containers:**

- The config generation script is a drop-in replacement of jinja template
  - (except if you were setting env variable ignored by jinja. Now they are not ignored anymore)
  - already used by daemons since rucio 1.26.8
  - planned to be used by all containers (servers, ui, probes) starting 1.27

- **Helm:**

- A helm value used to switch the daemons chart behavior since (chart) version 1.26.7 (`exportConfigToEnv`)
  - default to True in 1.26
  - probably will default to False in all 1.27 charts. This stops exporting the config as ENV variables, but the final content of `rucio.cfg` will be unchanged in most cases
  - and removed in 1.28. Again, shouldn't change anything for most users



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