Tools for Physicists

EPICS Tutorial

Pick a number between 02 and 12 -> `<num>`

install docker

```
sudo snap install docker
```

Check with

```
sudo docker run hello-world
```

To not have to run docker with sudo all the time we add our user to the group docker.

```
sudo addgrp docker
sudo usermod -aG docker <username>
```

Check with

```
docker run hello-world
```

Run EPICS Run

```
docker run \
  --rm -it \
  --network host \
  --name my-epics \
  pklaus/epics_base:7.0.4_debian
```

```
docker tag pklaus/epics_base:7.0.4_debian epics
```

db file

Open a 2nd Terminal window and create a file `tutorial.db`. Insert the following code:

```
record(ao, "<num>:Tut:AO")
{
  field(DESC,"Tutorial AO")
}

record(ai, "<num>:Tut:AI")
{
```

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```
    field(DESC,"Tutorial AI")
}
```

Remember that the PVs should have individual names, so perhaps it is a good idea to change things up a little bit.

Copy this file into your running EPICS container:

```
docker cp tutorial.db my-epics:/epics/iocs/example/db
```

Start IOC

Attach the EPICS container and start an IOC with `softIoc`.

```
docker attach my-epics
softIoc
```

Enter the following to load your records:

```
<epics> dbLoadRecords tutorial.db
<epics> iocInit
<epics> dbl
```

Basic interactions

Now open a second container and check if you are able to read and set your PVs with:

```
docker run -it --rm --name client --network host epics
caget <num>:Tut:AO
caput <num>:Tut:AO 11
```

Also try to read the PVs from an other group.

Units & Calc record

Apply a unit (l/s) to your ai-record.

Then create an additional record in `Tutorial.db`. This should convert the values of your ai-record from l/s to l/h (liter per hour) automatically. Restart the IOC and check the functionality of the record by monitoring the new process variable with camonitor and changing the values of your ai-record with caput.

st.cmd

If you are tired of reloading the database each time make a start file `my-st.cmd` with:

```
#! ../../bin/linux-x86_64/EXAMPLE
dbLoadRecords db/tutorial.db
iocInit
```

Copy it inside your running container and make it executable:

```
docker cp my-st.cmd my-epics:/epics/iocs/example/iocBoot/iocEXAMPLE/
```

Inside my-epics:

```
cd /epics/iocs/example/iocBoot/iocEXAMPLE/
chmod +x my-st.cmd
```

Alarms

Make yourself familiar with the different alarm levels. Add some of them to a record of you choice.