

# Rstudio on the Urblauna cluster

Rstudio can be run on the Urblauna cluster from within a singularity container, with an interactive interface provided on the web browser of a [Guacamole](#) session.

Running interactively with Rstudio on the clusters is only meant for testing. Development must be carried out on the users workstations, and production runs must be accomplished [from within R scripts/codes in batch mode](#).

The command Rstudio is now available in r-light module. You have to do a reservation first with Sinteractive, ask the right amount of resources and then launch the command 'Rstudio'.

## Procedure

```
Sinteractive  # specify here the right amount of resources
module load r-light
Rstudio
```

The procedure below is now deprecated !!

## Preparatory steps on Curnagl side

A few operations have to be executed on the Curnagl cluster:

1. Create a directory in your /work project dedicated to be used as an R library, for instance:

```
mkdir /work/FAC/FBM/DBC/myip/project/R_ROOT
```

2. Optional : install required R packages, for instance `ggplot2`

```
module load gcc r
```

```
export R_LIBS_USER=/work/FAC/FBM/DBC/myip/project/R_ROOT
```

```
R
```

```
>>>install.packages("ggplot2")
```

## The batch script

Create a file **rstudio-server.sbatch** with the following contents (it must be on the cluster, but the exact location does not matter):

```
#!/bin/bash -l

#SBATCH --account <<<ACCOUNT_NAME>>>
#SBATCH --job-name rstudio-server
#SBATCH --signal=USR2
#SBATCH --output=rstudio-server.job
#SBATCH --nodes 1
#SBATCH --ntasks 1
#SBATCH --cpus-per-task 1
#SBATCH --mem 8G
#SBATCH --time 02:00:00
#SBATCH --partition interactive
#SBATCH --export NONE

RLIBS_USER_DIR=<<<RLIBS_PATH>>>
RSTUDIO_CWD=~
RSTUDIO_SIF="/dcsrsoft/singularity/containers/rstudio-4.3.2.sif"

module load python singularityce
module load r
RLIBS_DIR=${R_ROOT}/rlib/R/library
module unload r

# Create temp directory for ephemeral content to bind-mount in the container
RSTUDIO_TMP=$(mktemp --tmpdir -d rstudio.XXX)

mkdir -p -m 700 \
    ${RSTUDIO_TMP}/run \
    ${RSTUDIO_TMP}/tmp \
    ${RSTUDIO_TMP}/var/lib/rstudio-server

mkdir -p ${RSTUDIO_CWD}/.R

cat > ${RSTUDIO_TMP}/database.conf <<END
provider=sqlite
directory=/var/lib/rstudio-server
END

# Set OMP_NUM_THREADS to prevent OpenBLAS (and any other OpenMP-enhanced
```

```

# libraries used by R) from spawning more threads than the number of processors
# allocated to the job.
#
# Set R_LIBS_USER to a path specific to rocker/rstudio to avoid conflicts with
# personal libraries from any R installation in the host environment

cat > ${RSTUDIO_TMP}/rsession.sh <<END
#!/bin/sh

export OMP_NUM_THREADS=${SLURM_CPUS_PER_TASK:-1}
export R_LIBS=${RLIBS_DIR}
export R_LIBS_USER=${RLIBS_USER_DIR}
export PATH=${PATH}:/usr/lib/rstudio-server/bin
exec rsession "\${@}"
END

chmod +x ${RSTUDIO_TMP}/rsession.sh

SINGULARITY_BIND+="${RSTUDIO_CWD}:${RSTUDIO_CWD},"
SINGULARITY_BIND+="${RSTUDIO_TMP}/run:/run,"
SINGULARITY_BIND+="${RSTUDIO_TMP}/tmp:/tmp,"
SINGULARITY_BIND+="${RSTUDIO_TMP}/database.conf:/etc/rstudio/database.conf,"
SINGULARITY_BIND+="${RSTUDIO_TMP}/rsession.sh:/etc/rstudio/rsession.sh,"
SINGULARITY_BIND+="${RSTUDIO_TMP}/var/lib/rstudio-server:/var/lib/rstudio-server,"
SINGULARITY_BIND="/users:/users,/scratch:/scratch,/work:/work,/dcsrsoft"
export SINGULARITY_BIND

# Do not suspend idle sessions.
# Alternative to setting session-timeout-minutes=0 in /etc/rstudio/rsession.conf
export SINGULARITYENV_RSTUDIO_SESSION_TIMEOUT=0

export SINGULARITYENV_USER=$(id -un)
export SINGULARITYENV_PASSWORD=$(openssl rand -base64 15)

# get unused socket per https://unix.stackexchange.com/a/132524
# tiny race condition between the python & singularity commands
readonly PORT=$(python -c 'import socket; s=socket.socket(); s.bind(("", 0));
print(s.getsockname()[1]); s.close()')
cat 1>&2 <<END

1. open the Guacamole web browser to http://${HOSTNAME}:${PORT}

```

2. log in to RStudio Server using the following credentials:

```
user: ${SINGULARITYENV_USER}
password: ${SINGULARITYENV_PASSWORD}
```

When done using RStudio Server, terminate the job by:

1. Exit the RStudio Session ("power" button in the top right corner of the RStudio window)
2. Issue the following command on the login node:

```
scancel -f ${SLURM_JOB_ID}
END

#singularity exec --env R_LIBS=${R_LIBS_DIR} --home ${RSTUDIO_CWD} --cleanenv ${RSTUDIO_SIF} \
singularity exec --home ${RSTUDIO_CWD} --cleanenv ${RSTUDIO_SIF} \
  rserver --www-port ${PORT} \
    --auth-none=0 \
    --auth-pam-helper-path=pam-helper \
    --auth-stay-signed-in-days=30 \
    --auth-timeout-minutes=0 \
    --rsession-path=/etc/rstudio/rsession.sh \
    --server-user=${SINGULARITYENV_USER}

SINGULARITY_EXIT_CODE=$?
echo "rserver exited $SINGULARITY_EXIT_CODE" 1>&2
exit $SINGULARITY_EXIT_CODE
```

You need to carefully replace, at the beginning of the file, the following elements:

- On line 3: <<<**ACCOUNT\_NAME**>>> with the project id that was attributed to your PI for the given project
- On line 14: <<<**R\_LIBS\_PATH**>>> must be replaced with the **absolute path** (ex. `/work/FAC/.../R_ROOT`) to the chosen folder you created on the preparatory steps

## Running Rstudio

Submit a job for running Rstudio from within the cluster with:

```
[me@urblauna ~]$ sbatch rstudio-server.sbatch
```

Once the job is running (you can check that with Squeue), a new file rstudio-server.job is then automatically created. Its contents will give you instructions on how to proceed in order to start a new Rstudio remote session from Guacamole.

In this script we have reserved 2 hours

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Révision #8

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