

RAS Linux v.6.5 Overview

Linux versions of the three HEC-RAS v.6.5 compute engines were built and tested:

- RasGeomPreprocess
- RasUnsteady
- RasSteady

The RAS compute programs were compiled for x64 using the Intel oneAPI v.2021 compiler under RHEL 8.

The download package Linux_RAS_v65.zip contains the three compute programs and supporting libraries for the Linux system.

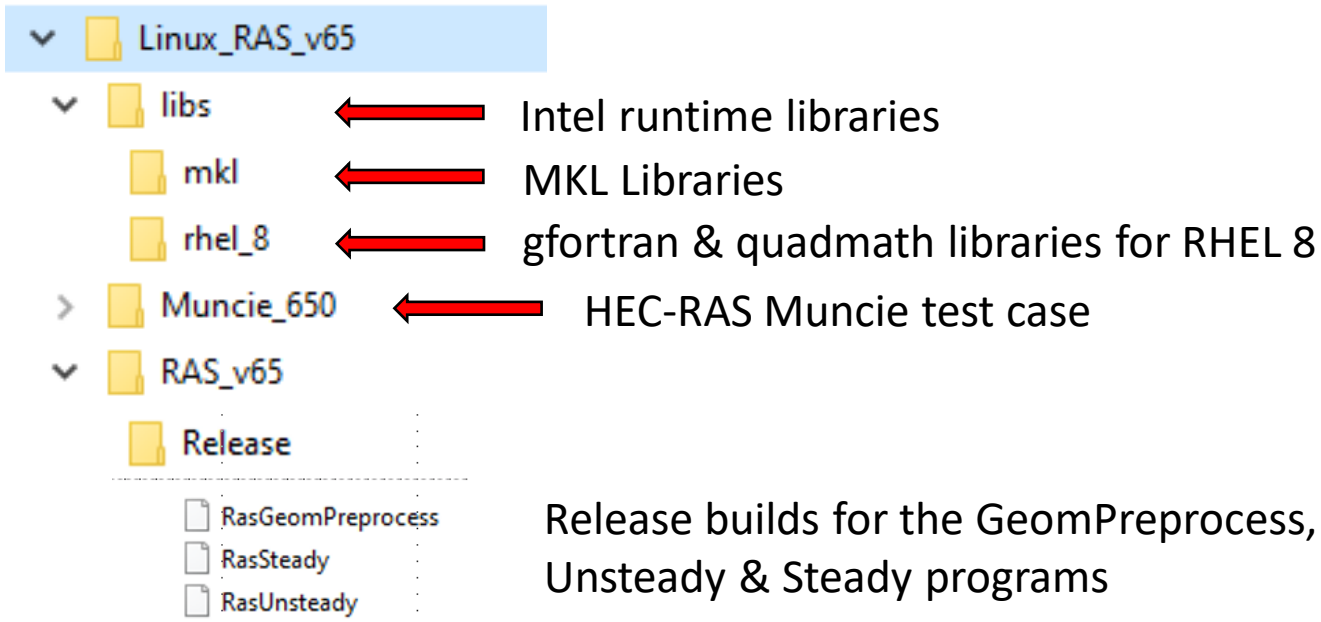
Included is the setup for running the HEC-RAS Muncie example problem on the Linux OS for the Geometry Preprocessor, Unsteady Flow Simulation, and the Steady Flow program.

RAS Linux v.6.5

The Linux_RAS_v65.zip contains Linux executables and a test case for:

- RasGeomPreprocess
- RasUnsteady
- RasSteady

Contents of the Linux_RAS_v65.zip



Library directories

The Intel and MKL library directories are for the Intel oneAPI version of the Fortran compiler (v. 2021.4.0)

The mkl directory contains *.so files supporting a range of Intel/AMD processors and compiler settings (e.g. AVX, AVX2)

The rhel_8 directory provides the required libgfortran.so and libquadmath.so if these are not already installed on the system

Muncie_650 Test











Input files were first generated from a HEC-RAS GUI compute:

*.b04, *.x04, *.p04.tmp.hdf

The *.p04.tmp.hdf is from the GUI compute, with “Results” Data Group removed using a python program.

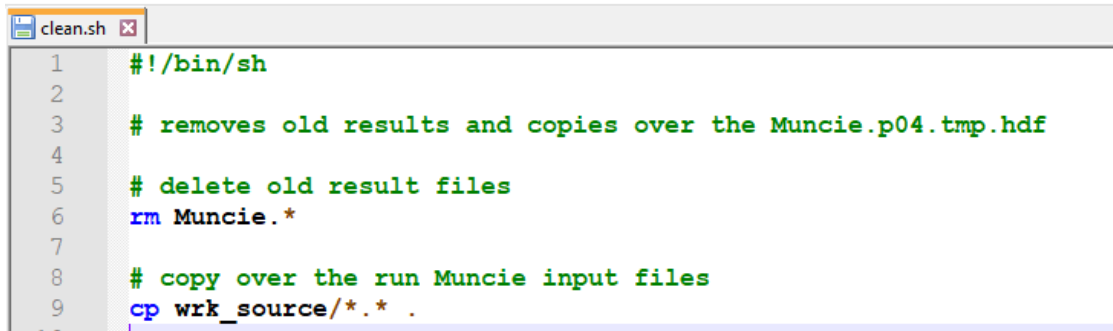
The *.r04 is setup from the HEC-RAS GUI post process step and serves as the test for the RAS Steady Flow compute program.

All text based files have the end of line CR removed.

▼  Muncie_650	←	Contains Muncie Test Case for Linux programs
 clean.sh	←	Deletes old results and copies input files from wrk_source
 run_geompre.sh	←	Script for Geometry Preprocessor run
 run_steady.sh	←	Script for Steady Flow run
 run_unsteady.sh	←	Script for Unsteady Flow run
 wrk_source		
 Muncie.b04	←	Unsteady input text file
 Muncie.p04.tmp.hdf	←	HDF result file from Unsteady compute, Results removed
 Muncie.r04	←	Text input file for Steady Compute
 Muncie.x04	←	Text input file with 1D Geometry info

Running the Test Case

Run the “clean.sh” from the Muncie_650 directory to remove old results and to copy over the input files from the “wrk_source” directory



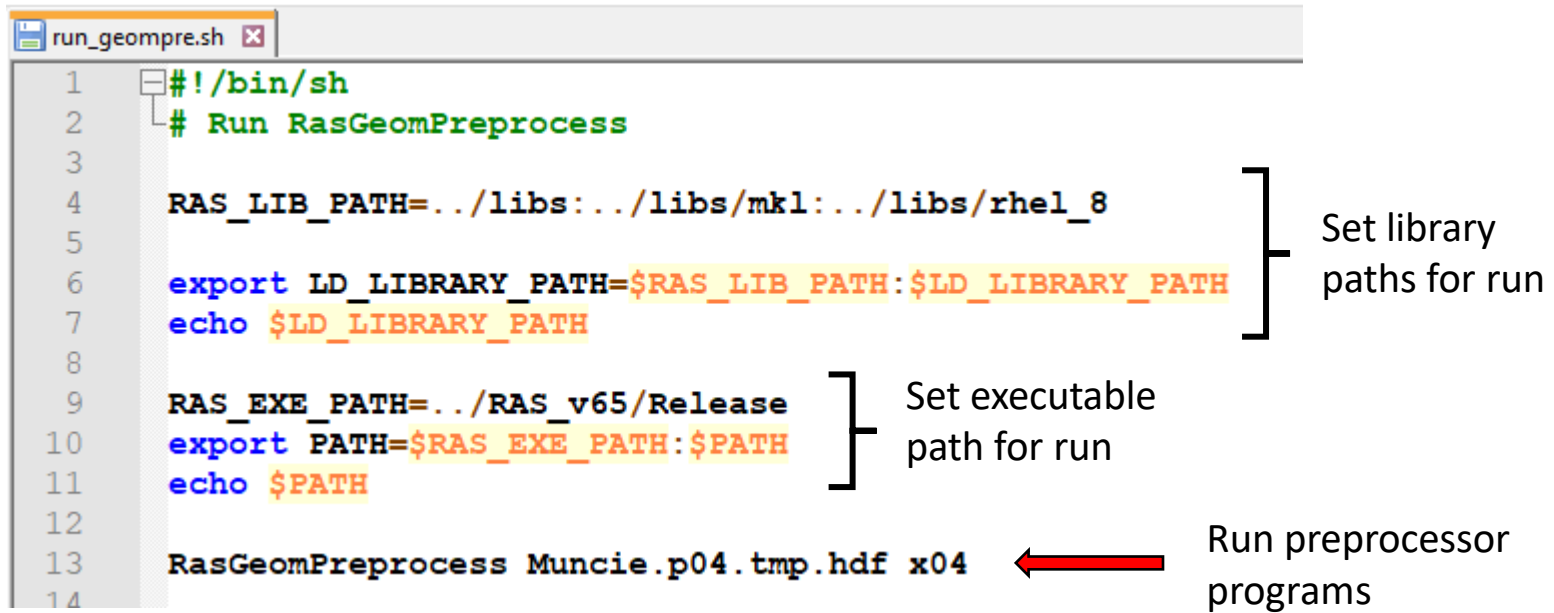
```
clean.sh
1  #!/bin/sh
2
3  # removes old results and copies over the Muncie.p04.tmp.hdf
4
5  # delete old result files
6  rm Muncie.*
7
8  # copy over the run Muncie input files
9  cp wrk_source/*.* .
```

Unless there are changes to the geometry inputs outside the HEC-RAS GUI, there should not be a need to run the RAS Geometry Preprocessor program. The necessary geometry and hydraulic properties information is already contained in the plan hdf file (e.g. Muncie.p04.tmp.hdf)

If geometry data is changed outside the HEC-RAS GUI, for example changes to the Muncie.x04 file, the RAS Geometry Preprocessor would then be run.

GeomPreprocessor run

Run the “run_geompre.sh” from the Muncie_650 directory
Not usually needed.



```
run_geompre.sh
1  #!/bin/sh
2  # Run RasGeomPreprocess
3
4  RAS_LIB_PATH=../libs:../libs/mkl:../libs/rhel_8
5
6  export LD_LIBRARY_PATH=$RAS_LIB_PATH:$LD_LIBRARY_PATH
7  echo $LD_LIBRARY_PATH
8
9  RAS_EXE_PATH=../RAS_v65/Release
10 export PATH=$RAS_EXE_PATH:$PATH
11 echo $PATH
12
13 RasGeomPreprocess Muncie.p04.tmp.hdf x04
14
```

Set library paths for run

Set executable path for run

Run preprocessor programs

The RasGeomPreprocess program updates the hydraulic property tables on the Muncie.p04.tmp.hdf file.

RAS Unsteady run

Run the “run_unsteady.sh” from the Muncie_650 directory

```
run_unsteady.sh x
1  #!/bin/sh
2  # Run RasUnsteady
3
4  RAS_LIB_PATH=../libs:../libs/mkl:../libs/rhel_8
5
6  export LD_LIBRARY_PATH=$RAS_LIB_PATH:$LD_LIBRARY_PATH
7  echo $LD_LIBRARY_PATH
8
9  #RAS_EXE_PATH=../RAS_v65/Debug
10 RAS_EXE_PATH=../RAS_v65/Release
11 export PATH=$RAS_EXE_PATH:$PATH
12 echo $PATH
13
14 RasUnsteady Muncie.p04.tmp.hdf x04
15
16 # rename the hdf file
17 mv Muncie.p04.tmp.hdf Muncie.p04.hdf
```

Set library paths for run

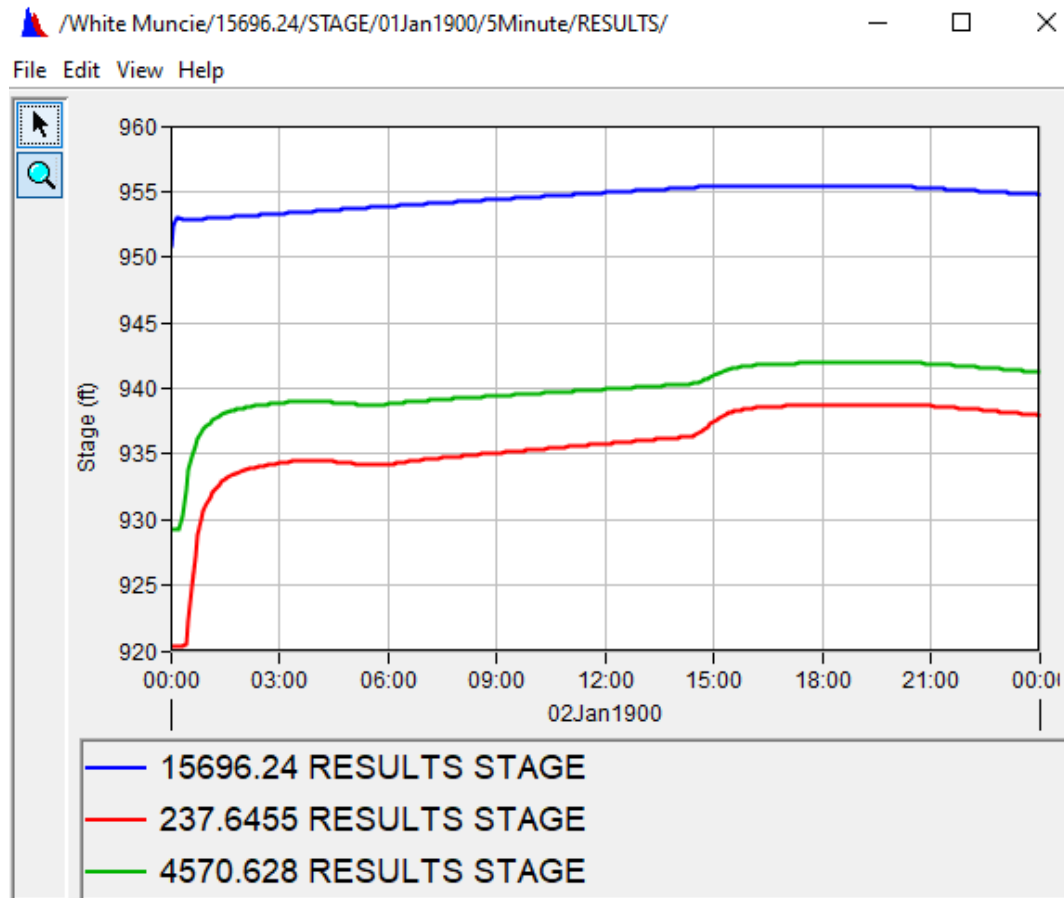
Set executable path for run

Run Unsteady program

Rename p04.tmp.hdf file

RAS Unsteady run

If successful, produces Muncie.dss file and Muncie.p04.hdf file



RAS Steady run

Run the “run_steady.sh” from the Muncie_650 directory

```
run_steady.sh x
1  #!/bin/sh
2  # Run RasSteady compute
3
4  RAS_LIB_PATH=../libs:../libs/mkl:../libs/rhel_8
5
6  export LD_LIBRARY_PATH=$RAS_LIB_PATH:$LD_LIBRARY_PATH
7  echo $LD_LIBRARY_PATH
8
9  #RAS_EXE_PATH=../RAS_v65/Debug
10 RAS_EXE_PATH=../RAS_v65/Release
11 export PATH=$RAS_EXE_PATH:$PATH
12 echo $PATH
13
14 RasSteady Muncie.r04
```

Set library paths for run

Set executable path for run

Run Steady program

If successful, produces Muncie.O04 file

NOTE: Requires the RAS Unsteady Flow computed first.

HEC RAS Run Setup for Linux

The procedure for performing a Linux run for a HEC-RAS river system is to generate the Unsteady Flow model input files by first performing a Windows HEC-RAS GUI run.

With reference to the HEC-RAS Muncie 1-D & 2-D example problem, the minimum set of input files to the unsteady flow compute files are:

- Muncie.b04

- Muncie.x04

- Muncie.p04.tmp.hdf

The Muncie.b04 and Muncie.x04 are text files generated by the HEC-RAS GUI in the pre-compute phase. These files will need to have the end of line carriage control characters removed.

The “Muncie.p04.tmp.hdf” file is developed from the Muncie.p04.hdf file generated with the Unsteady Flow compute with the HEC-RAS GUI.

A python script is utilized to prepare the *.p04.hdf file for a Linux run.
See the document “remove_HDF_results.pdf” for instructions.