

HPC cluster @ProtoLab

A computational infrastructure for ANSYS Fluent and Mechanical using Remote Service Manager (RSM)

Goals

1. Share a small HPC cluster to solve CFD and structural analyses with Ansys directly from your laptop.
2. Optimal usage of machines present in ProtoLab by means of a smart management of the queues using Ansys RSM.
3. Limit the usage of Ansys license on your laptop. The problem will be solved remotely using only one licence.

Remote Service Manager (RSM)

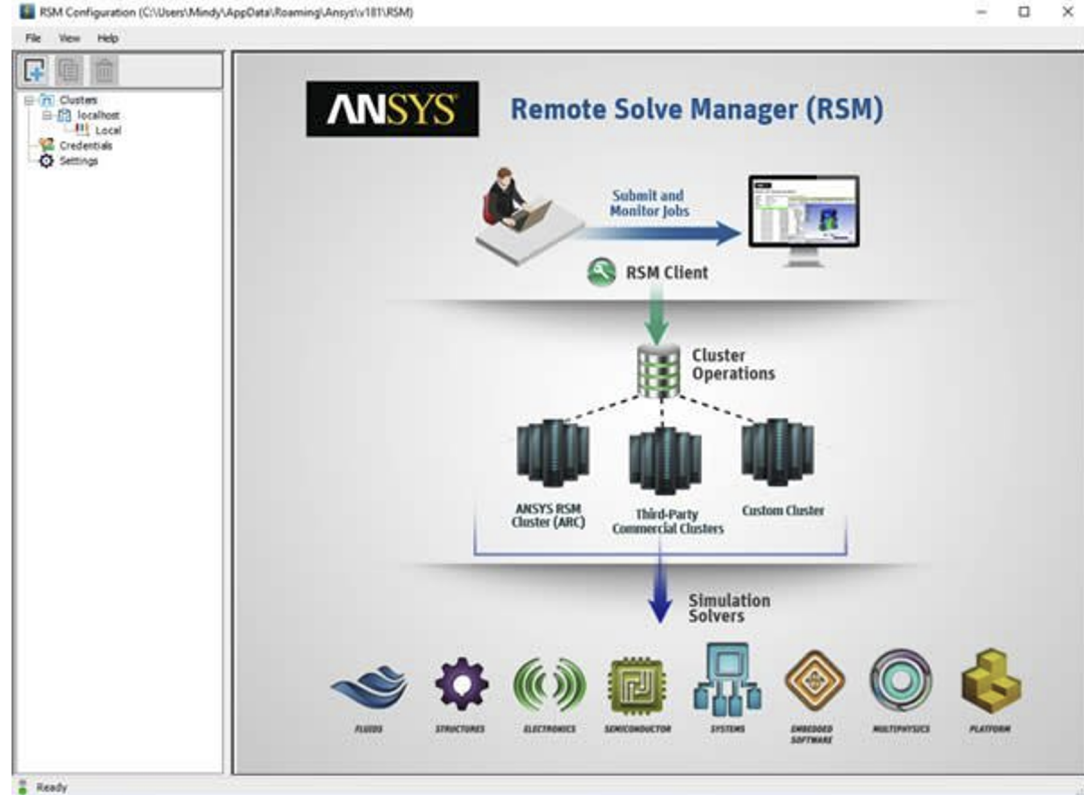
Start > ANSYS 20.1 > RSM Configuration 2020 R1.

What is RSM?

- Allows to run simulation in background both on your laptop or on a remote cluster
- Automatically handles process queues (similar to Slurm queue management on Tomato)

Which kind of analyses I can do?

- Any kind of solver available with our current licence (Academic Mechanical and CFD) can be used.



Current servers available

1. **RedOrange:** Dell PowerEdge R740 Server, 2xIntel Xenon Gold 6248, 16 cores, 256 Gb RAM. (ABAQUS dedicated)
2. **Ortho cluster:** One master node + 4 computational nodes
 - a. **Tomato (master):** Dell PowerEdge R820 4x Intel Xeon E5-4620 @ 2.20 GHz, 32 cores, 252 Gb RAM.
 - b. **Artichoke, Cauliflower, Carrot, and Eggplant (computational):** Dell PowerEdge R815 4x AMD Opteron 6272 @ 2.1GHz, 64 cores, 252 Gb RAM.
3. **Blackmamba:** Dell Precision 5820 Tower, Intel Xeon W-2125 @ 4.0 GHz, 256 Gb RAM. (Open source/in-house softwares)

Coming soon... **BigBlackMama**



8 Cores
192 Gb RAM

10 Gb/sec ethernet connection



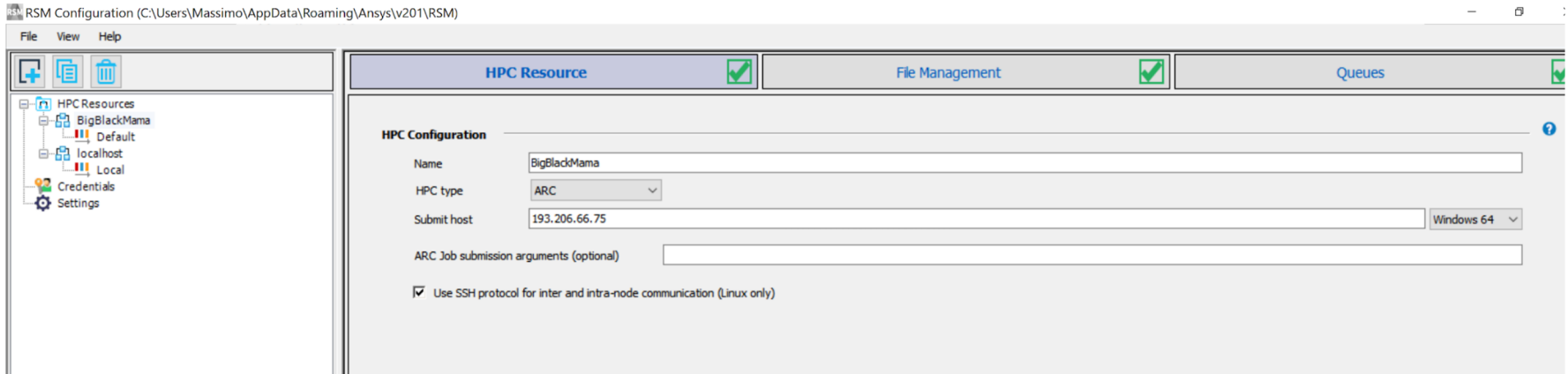
14 Cores
256 Gb RAM

Total resources
22 Cores
448 Gb RAM

Remote Service Manager Tutorial

How to set up RSM (client)

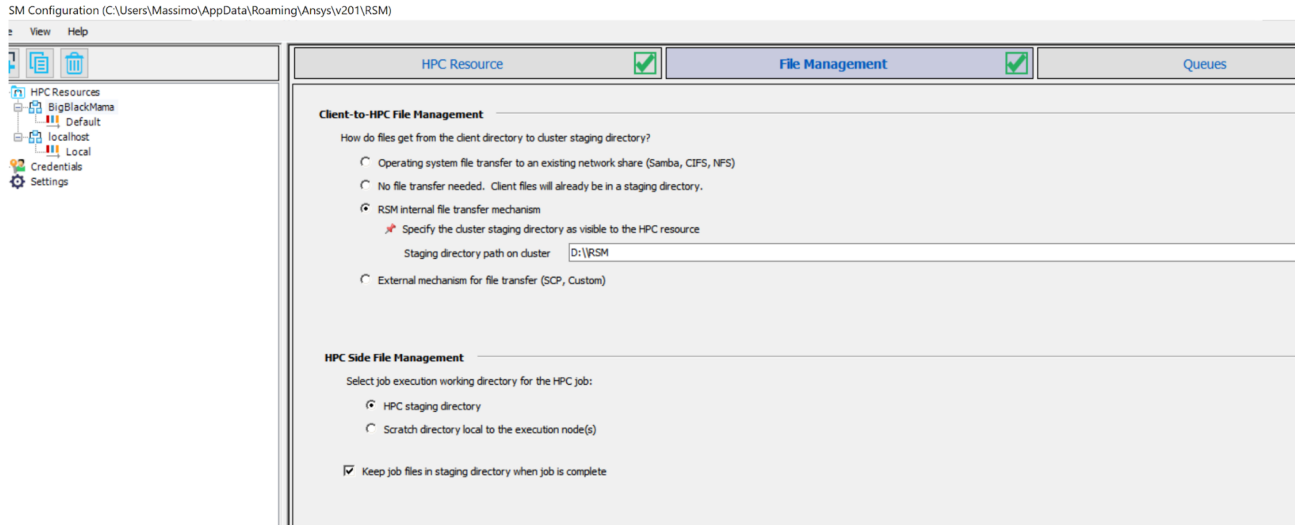
1. In the left column click the “+” icon and add a new HPC resource
2. In the first window “HPC Resource” specify the HPC configuration setting:
 - a. Name: BigBlackMama
 - b. HPC type: ARC
 - c. Submit host: 193.206.66.75 Windows 64



How to set up RSM (client)

3. In Client-to-HPC File Management check the box “RSM internal file transfer mechanism” and insert the directory path “D:\\RSM”

4. In HPC Side File Management check “HPC staging directory” and “Keep job files”



How to set up RSM (client)

5. Finally “Import queues” will generate the queues to handle the jobs on the server. Please, use the “Default” queue.

RSM Configuration (C:\Users\Massimo\AppData\Roaming\Ansys\v201\RSM)

File View Help

HPM Resources HPC Resource File Management Queues

HPM Resources
BigBlackMama
Default
localhost
Local
Credentials
Settings

Queues from ARC on 'BigBlackMama'

Enabled	RSM Queue	ARC Queue	Test	Status	Report
<input checked="" type="checkbox"/>	Default	default	<button>Submit</button>	?	
<input type="checkbox"/>	Local (1)	local	<button>Submit</button>	?	

How to set up RSM (client)

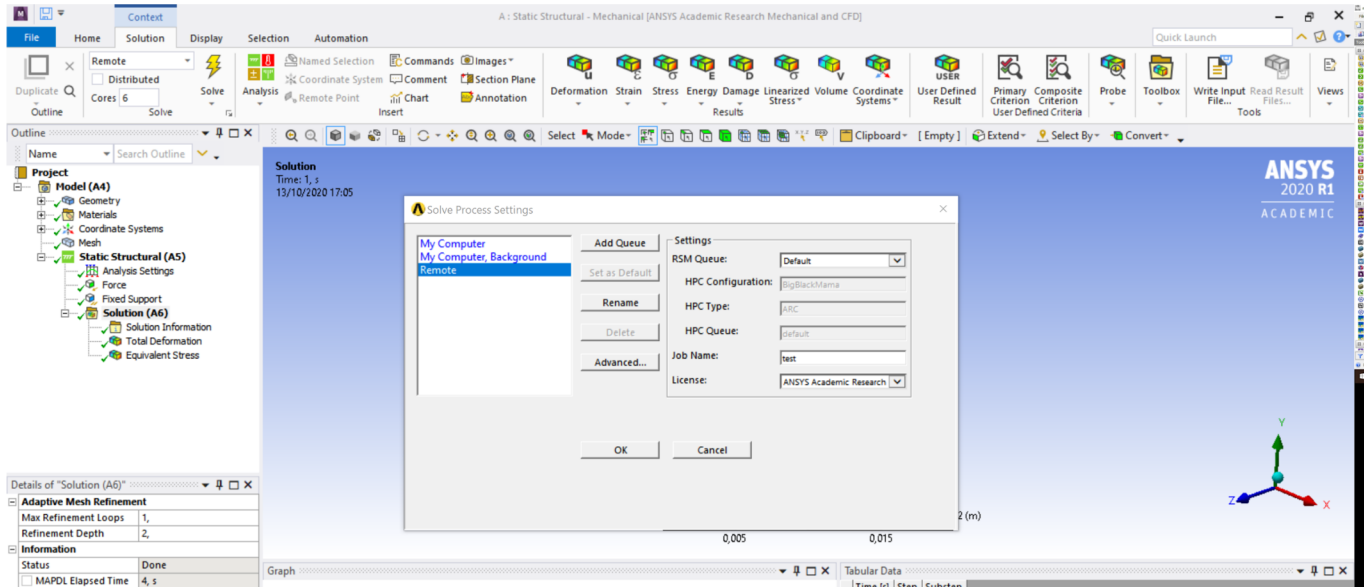
6. To complete the setup you need to fulfill the “Credentials”. Once step 1-5 have been successfully completed please write to the cluster Administrators for obtaining your credentials.

Administrators:

- Gianluca Alaimo gianluca.alaimo@unipv.it
- Massimo Carraturo massimo.carraturo@unipv.it

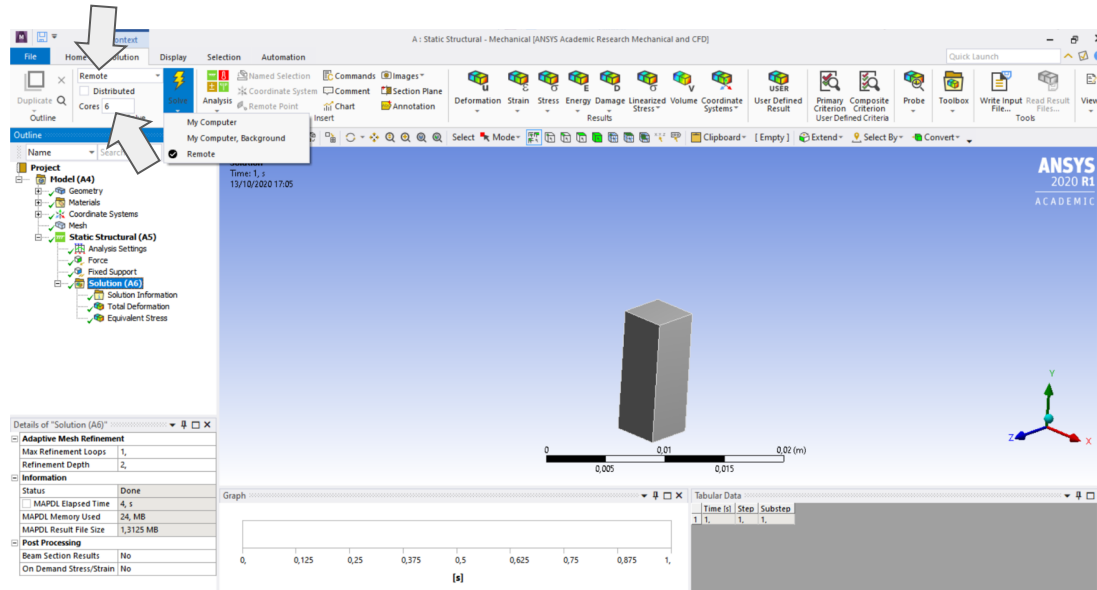
How to solve an analysis using RSM

In File->Solver Process Setting select Remote, the queue (Default), the Job Name, and the specific Ansys licence (ANSYS Academic Research Mechanical and CFD)



How to solve an analysis using RSM

Set up the Ansys project locally on your PC. When you have to run the analysis select in the drop down menu on the top left “Remote” and specify the max number of cores to be used.



How to solve an analysis using RSM

We can now save the project locally, close Ansys Workbench, and free the licence.

If the job is not finished, when we open it back Ansys will send us a warning.

Otherwise, we can download the result files on our PC using the function “Get Results”.

Timeline

1. Next week: RSM available for ANSYS Fluent and Mechanical
1. December 2020: Full cluster available for HPC analyses

Questions?