Contents

[How to run a simulation on a remote cluster 1](#_Toc457072101)

[Preparing a HPC cluster (under Linux) 1](#_Toc457072102)

[Preparing local machine (under Windows) 1](#_Toc457072103)

[How to run simulation on local machine 2](#_Toc457072104)

# Preparing for the first launch

## Local machine side (under Windows)

Download two directories ***host*** and ***worker*** from GITHUB repository to a local computer:

<https://github.com/LeonidSavtchenko/Arachne>

1. Copy the directory “<root>/host at any place of your local computer with Windows operating system and preinstalled MATLAB.
2. Copy the directory/worker on your cluster. ( See details “How to run a simulation on a remote cluster”)

To test the model ARACHNE, the cluster, located at 144.82.46.83, is already prepared. The following directory contains preinstalled software:

/home/reviewer/worker

Password: reviewer1

In this case to start a simulation with the configuration:

1. Go to the directory … “<root>/host at your local computer
2. Launch the following Matlab script: “<root>/host/START\_GammaSimulator.m”.
3. When GUI appears, and then check the parameters of the model. At this stage you can change the settings.
4. After that you can click “OK” -- the simulation will be conducted on the remote cluster at 144.82.46.83.
5. When the simulation is completed, there will be plot with the simulation results

If you want to reinstall the application on this cluster or to install it on other Linux clusters you need to do the following.

# How to run a simulation on a remote cluster

## Preparing a HPC cluster (under Linux)

1. Before installing the cluster’s part of the software, you must be sure that “mpic++” compiler is present in the system path.
2. Download the folder “worker” with all its content from GIT repository to a cluster’s place shared between cluster nodes. For example, the place can be the directory “/home/<username>”. This directory will be referred as “<root>” below.
3. Open file “<root>/worker/build/lin\_release.sh” and adjust the variables “MLDIR” and “GSDIR” to be consistent with your cluster.
4. Compile the application running this script. If the compilation is successful, the file “***gs.exe***” must appear in the parental directory.

## Preparing local machine (under Windows)

1. Make sure that you have Matlab installed on the machine.
2. Download the folder “host” with all its content from GIT repository to your local machine.
3. Open file “<root>\host\Code\scripts\win-lin\params.bat” and adjust the following 4 variables: “HEADNODEIP” – IP address of the cluster, “LOGIN” – Login name of your account of the cluster, “PASSWORD” – password of your account, “HEADNODEWORKERDIR” – the address of the location of “***gs.exe”*** file on the cluster, to be consistent with your cluster.
4. Open file “<root>\host\Code\BasicParams\BasicParams.m”, set remoteHPC = true, initialize “availableNodes” cell array with the full range of names for all the nodes in your cluster and “ramPerNode” with the minimum amount of physical memory installed on a cluster node (in megabytes).
5. Launch the following Matlab script: “<root>\host\START\_GammaSimulator.m”.
6. When GUI appears, go to “HPC” panel and adjust the following three elements:

* checkbox “fakeMPI” -- unchecked,
* editbox “nt” = the number of processor cores per one cluster node,
* editbox “loadedNodes” = cell array with names of cluster nodes to use in the next simulation. This array should not contain any nodes out of the “availableNodes”.

1. After that you can click “OK” -- the simulation will be conducted on the remote cluster.

# How to run simulation on local machine without a cluster

1. Make sure that you have Matlab installed on the machine.
2. Make sure that you have Visual Studio Community installed on the machine. This free IDE can be downloaded here:

<https://www.visualstudio.com/en-us/products/visual-studio-community-vs.aspx>

The “Visual C++” option must be checked during installation.

1. Download the folders “host” and “worker” with all their content from git repository to your local machine.
2. Open file “<root>\worker\build\vars.bat” in text editor and adjust the following 3 paths to be consistent with your machine: “VSDIR”, “MLDIR”, “GSDIR”.
3. Run script “win\_fakeMPI\_release.bat” located in this directory. The file “gs\_fakeMPI.exe” should appear in the parental directory after that.
4. Open file “<root>\host\Code\scripts\win-win\params.bat” and adjust the following 2 paths: “MATLABHOSTDIR”, “WORKERDIR”.
5. Open file “<root>\host\Code\BasicParams\BasicParams.m” and set remoteHPC = false.
6. Launch the following Matlab script: “<root>\host\START\_GammaSimulator.m”.
7. When GUI appears, go to “HPC” panel and adjust the following three elements:

* checkbox “fakeMPI” -- checked,
* editbox “nt” = the number of cores in your processor,
* checkbox “backgroundMode” -- unchecked.

1. After that you can click “OK” -- the simulation will be conducted on your local machine instead of the cluster.