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# How to run simulation on remote cluster

## Preparing HPC cluster (under Linux)

1. Make sure that “mpic++” compiler is present in the system path.
2. Download the folder “worker” with all its content from git repository. This folder must be saved to some place shared between cluster nodes. For example, it can be saved in 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 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”, “LOGIN”, “PASSWORD”, “HEADNODEWORKERDIR” to be consistent with your cluster.
4. Open file “<root>\host\Code\BasicParams\BasicParams.m”, set remoteHPC = true and initialize “availableNodes” cell array with the full range of names for all the slave nodes in your cluster.
5. Open file “<root>\host\GUI\Remainders\HpcParamsRemainder.m” and adjust the limits of physical memory usage for cluster nodes.
6. Launch the following Matlab script: “<root>\host\START\_GammaSimulator.m”.
7. When GUI appears, go to “HPC” panel and adjust the following two 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

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.