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How to add Neptuno facilities to WRF4G

WRF4G uses [DRM4G](#) to access to different Distributed Resource Managements (DRM) such as:

- PBS/Torque
- SGE
- FORK
- LoadLeveler
- **SLURM**

In order to add new resources, you need to edit [Computing Resources](#) section in the [framework4g.conf](#) file, which is located under `$HOME/WRF4G/etc` directory. The file has to contain one resource per line with the format:

```
resource_name = attributes
...
resource_name = attributes
```

where:

- **resource_name**: It is the name of the CR.
- **attributes**: They are the static attributes of the CR. The syntax is:

```
<scheme>://<username>@<host:port>?<query>
```

scheme: URL schemes available are "ssh" and "local".

- **ssh**: In order to connect to remote resource via SSH
- **local**: In order to use a local resource
- **username**: user name on the resource
- **host**: host name
- **port**: host port. By DEFAULT it is 22

query: contains additional information of computing resources. The query string syntax is:

- `key1=value1;key2=value2;key3=value3`

The keys available are:

- **LRMS_TYPE**(mandatory): Type of LRMS system (**neptuno**)
- **NODECOUNT**(mandatory): Maximum number of job slots for a resource.
- **SSH_KEY_FILE**(optional): It defines the key file for "ssh" connection. By DEFAULT it is `~/.ssh/id_rsa`.
- **TEMP_DIR**(optional): Temporary directory on the resource to store data. By DEFAULT it is `$HOME`. `TEMP_DIR` path must be absolute.
- **RUN_DIR**(optional): Temporary directory used to run WRF Model on the resource. By DEFAULT it is `$HOME`. `RUN_DIR` path must be absolute.

Example of configuration:

```
neptuno = ssh://userid@193.144.213.182?LRMS_TYPE=neptuno;NODECOUNT=1500
```

If you want to configure Neptuno facilities using **ssh** protocol, you need to set up SSH login without *password* (see [Appendix B](#)) between **MACC cluster** and **Neptuno**, and **vice-versa**.

After modifying `ComputingResources` section, WRF4G takes few seconds in order to update the changes

Neptuno Data Repository

In addition, you need to update `WRF4G_BASEPATH`, `WRF4G_DOMAINPATH`, `WRF4G_INPUT` and `WRF4G_APPS` variables, which are defined in [resources.wrf4g](#) file. Due to the fact that these variables may point to other machines by default. See [running environment](#) for more information as well.

Example of configuration:

```
WRF4G_BASEPATH="rsync://userid_macc@193.144.213.182/home/users/user_neptuno/output"
WRF4G_DOMAINPATH="rsync://userid_macc@193.144.184.31/work/gihc/repository/domains"
```

```
WRF4G_INPUT="rsync://userid_macc@193.144.184.31/work/gihc/repository/input"
WRF4G_APPS="rsync://userid_macc@193.144.184.31/work/gihc/repository/apps"
```

Neptuno Running Options

[Running Options](#) section is defined in [resources.wrf4g](#) file and its variables of interest are:

- **NP** is the number of processors requested in a parallel job.
- **PPN** indicates the number of processors available per node.

Example of configuration:

```
REQUIREMENTS = 'PPN = 16'
NP = 16
```

NP = 16 and REQUIREMENTS = 'PPN = 16' which means 16 processors on one node.

Seawing Package Version

[Package Version](#) section is defined in [resources.wrf4g](#) file.

- **WRF4G_VERSION** : WRF4G version to use. A file WRF4G-[WRF4G_VERSION].tar.gz must exist under \$HOME/etc/templates.
- **WRF_VERSION**: WRFbin version to use. A file WRFbin-[WRF_VERSION].tar.gz must exist under \$WRF4G_APPS.

And for this experiment, we are going to use:

```
WRF4G_VERSION="1.0"
WRF_VERSION="3.1.1_r832INTEL_OMPInew"
```