EMA 3D Simulation - Consulting - Measurement
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EMC Plus and Charge Plus Linux Installation Guide

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Getting Started

1. Download the latest version of the EMC Plus and Charge Plus Linux installer, for both GPU and CPU machines, from the EMC Plus and Charge Plus Quick Start Page.
2. Copy the downloaded EMC Plus and Charge Plus zipped archive into a directory on the Linux machine.
3. From this directory, unzip the file using the following command:
    a. tar -zxvf EMC_PLUS_CHARGE_PLUS_LINUX_ANSYSv<**VERSION>**.tar.gz
        i. e.g. *tar -zxvf EMC_PLUS_CHARGE_PLUS_LINUX_ANSYSv8.1.7.tar.gz*
4. A sub-directory should now be created called *EMC_PLUS_CHARGE_PLUS_LINUX_ANSYSv<**VERSION**>* that contains the following items:
    a. ansys/
    b. binaries/
    c. lib/
    d. CHARGE/
    e. CUDA/
    f. MPI/
    g. installer_ansys.sh
5. Move into this subdirectory and execute the installer with the following commands:
    a. cd *EMC_PLUS_CHARGE_PLUS_LINUX_ANSYSv <**VERSION NUMBER**>*
        i. e.g. *cd EMC_PLUS_CHARGE_PLUS_LINUX_ANSYSv8.1.7*
    b. sudo ./installer_ansys.sh
6. Follow the on-screen prompts to select the location of the installation directory. It is recommended to install the required Open MPI, Intel MPI if using Charge Plus, and CUDA dependencies at this time. To do so, and have everything install into default directories, type the following at the prompt:
    a. /opt/EMA

b. y

c. y

d. y

NOTE: If Intel MPI is already installed, it may be necessary to uninstall and remove the current version of MPI before proceeding with the EMC Plus and Charge Plus installation. A reinstallation of Intel MPI may then be performed along with EMC Plus and Charge Plus, as described above. You may also need to install libatomic through your distribution's package manager if it is not already present. If using Charge Plus and EMC Plus together, you will need to manage Open MPI and Intel MPI together. Suggestions on how to do this are given during installation.

7. After the installation, a few environment variables must be set before running the program. The console will display exactly which environment variables must be defined. Use the *export* command followed by the environment variable definition given on the console to set these. An example of the commands to run follows:
   a. export PATH=/opt/EMA/EMC_PLUS_CHARGE_PLUS_LINUX_ANSYSv8.1.7/binaries:$PATH
   b. export LD_LIBRARY_PATH=/opt/EMA/EMC_PLUS_CHARGE_PLUS_LINUX_ANSYSv8.1.7/ansys:$LD_LIBRARY_PATH
   c. export PATH=/opt/MPI/comm_libs/openmpi/openmpi-3.1.5/bin:$PATH
   d. export ANSYSLMD_LICENSE_FILE=<***Port Number***>@<***License Server***>

Running EMC Plus or Charge Plus

1. Navigate to the directory on the Linux machine containing the simulation input files (e.g. .EMIN files) you would like to run.
2. Run the following command for EMC Plus:
   a. mpiexec -n <**NUMBER OF PROCESSES**> ema3d_gpu_linux_single <**NAME OF INPUT FILE**>.<**FILE TYPE**>
   b. e.g. *mpiexec -n 1 ema3d_gpu_linux_single shielding_box_demo_complete.emin*
3. Run the following command for Charge Plus (in a directory with a globalSim.dat file present):

   a. <**ALIAS FOR INTEL MPI>** -np 1 charge_linux

4. Time stepping should proceed and be displayed on the screen, indicating a successful installation.