

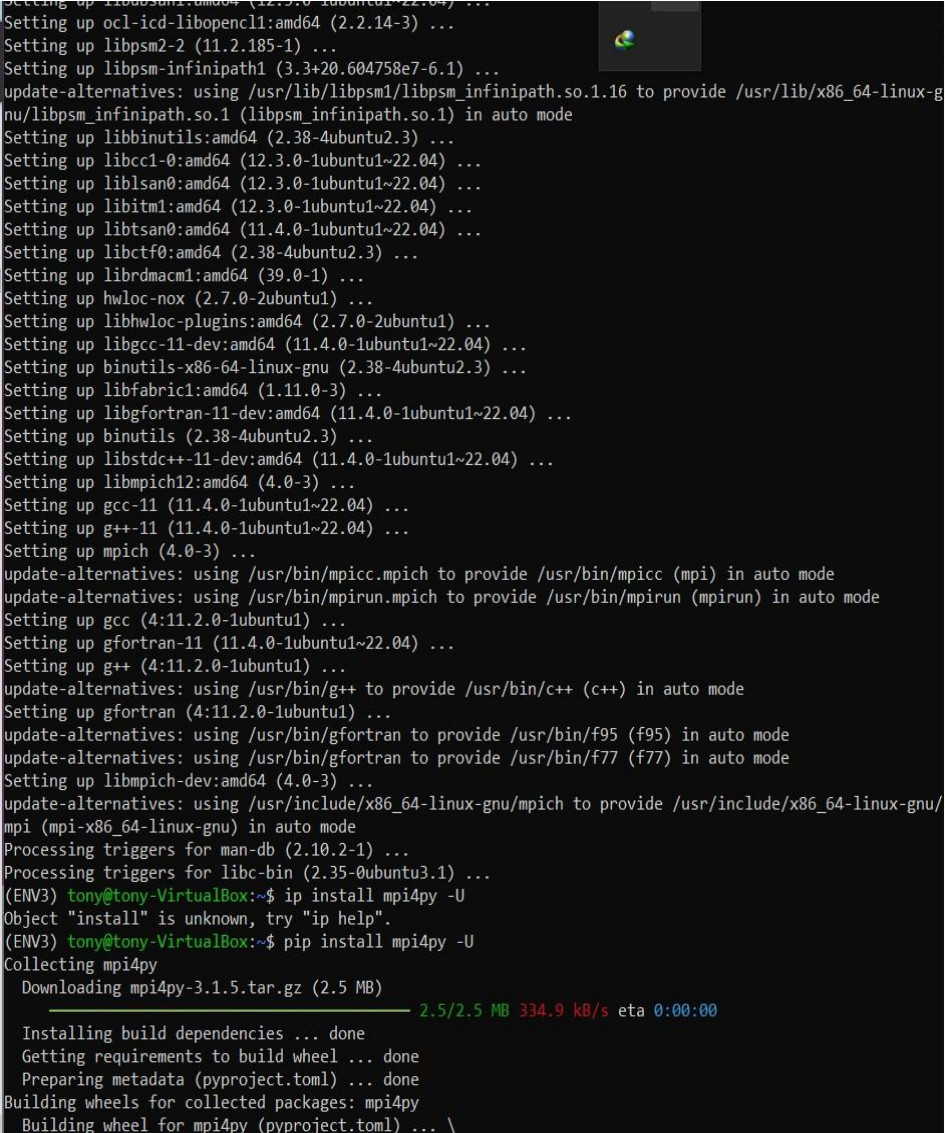
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Prodi : Teknik Komputer

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## Instalasi MPI dari Ubuntu



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Setting up libibverbs1:amd64 (22.3-0ubuntu1~22.04) ...
Setting up ocl-icd-libopencl1:amd64 (2.2.14-3) ...
Setting up libpsm2-2 (11.2.185-1) ...
Setting up libpsm-infinipath1 (3.3+20.604758e7-6.1) ...
update-alternatives: using /usr/lib/libpsm1/libpsm_infinipath.so.1.16 to provide /usr/lib/x86_64-linux-g
nu/libpsm_infinipath.so.1 (libpsm_infinipath.so.1) in auto mode
Setting up libbinutils:amd64 (2.38-4ubuntu2.3) ...
Setting up libcc1-0:amd64 (12.3.0-1ubuntu1~22.04) ...
Setting up liblsan0:amd64 (12.3.0-1ubuntu1~22.04) ...
Setting up libitm1:amd64 (12.3.0-1ubuntu1~22.04) ...
Setting up libtsan0:amd64 (11.4.0-1ubuntu1~22.04) ...
Setting up libctf0:amd64 (2.38-4ubuntu2.3) ...
Setting up librdmacm1:amd64 (39.0-1) ...
Setting up hwloc-nox (2.7.0-2ubuntu1) ...
Setting up libhwloc-plugins:amd64 (2.7.0-2ubuntu1) ...
Setting up libgcc-11-dev:amd64 (11.4.0-1ubuntu1~22.04) ...
Setting up binutils-x86-64-linux-gnu (2.38-4ubuntu2.3) ...
Setting up libfabric1:amd64 (1.11.0-3) ...
Setting up libgfortran-11-dev:amd64 (11.4.0-1ubuntu1~22.04) ...
Setting up binutils (2.38-4ubuntu2.3) ...
Setting up libstdc++-11-dev:amd64 (11.4.0-1ubuntu1~22.04) ...
Setting up libmpich12:amd64 (4.0-3) ...
Setting up gcc-11 (11.4.0-1ubuntu1~22.04) ...
Setting up g++-11 (11.4.0-1ubuntu1~22.04) ...
Setting up mpich (4.0-3) ...
update-alternatives: using /usr/bin/mpicc.mpich to provide /usr/bin/mpicc (mpi) in auto mode
update-alternatives: using /usr/bin/mpirun.mpich to provide /usr/bin/mpirun (mpirun) in auto mode
Setting up gcc (4:11.2.0-1ubuntu1) ...
Setting up gfortran-11 (11.4.0-1ubuntu1~22.04) ...
Setting up g++ (4:11.2.0-1ubuntu1) ...
update-alternatives: using /usr/bin/g++ to provide /usr/bin/c++ (c++) in auto mode
Setting up gfortran (4:11.2.0-1ubuntu1) ...
update-alternatives: using /usr/bin/gfortran to provide /usr/bin/f95 (f95) in auto mode
update-alternatives: using /usr/bin/gfortran to provide /usr/bin/f77 (f77) in auto mode
Setting up libmpich-dev:amd64 (4.0-3) ...
update-alternatives: using /usr/include/x86_64-linux-gnu/mpich to provide /usr/include/x86_64-linux-gnu/
mpi (mpi-x86_64-linux-gnu) in auto mode
Processing triggers for man-db (2.10.2-1) ...
Processing triggers for libc-bin (2.35-0ubuntu3.1) ...
(ENV3) tony@tony-VirtualBox:~$ ip install mpi4py -U
Object "install" is unknown, try "ip help".
(ENV3) tony@tony-VirtualBox:~$ pip install mpi4py -U
Collecting mpi4py
  Downloading mpi4py-3.1.5.tar.gz (2.5 MB)
    2.5/2.5 MB 334.9 kB/s eta 0:00:00
Installing build dependencies ... done
Getting requirements to build wheel ... done
Preparing metadata (pyproject.toml) ... done
Building wheels for collected packages: mpi4py
  Building wheel for mpi4py (pyproject.toml) ... \
```

Gambar proses instalasi python dan MPI

```

Setting up libfabric1:amd64 (1.11.0-3) ...
Setting up libgfortran-11-dev:amd64 (11.4.0-1ubuntu1~22.04) ...
Setting up binutils (2.38-4ubuntu2.3) ...
Setting up libstdc++-11-dev:amd64 (11.4.0-1ubuntu1~22.04) ...
Setting up libmpich12:amd64 (4.0-3) ...
Setting up gcc-11 (11.4.0-1ubuntu1~22.04) ...
Setting up g++-11 (11.4.0-1ubuntu1~22.04) ...
Setting up mpich (4.0-3) ...
update-alternatives: using /usr/bin/mpicc.mpich to provide /usr/bin/mpicc (mpi) in auto mode
update-alternatives: using /usr/bin/mpirun.mpich to provide /usr/bin/mpirun (mpirun) in auto mode
Setting up gcc (4:11.2.0-1ubuntu1) ...
Setting up gfortran-11 (11.4.0-1ubuntu1~22.04) ...
Setting up g++ (4:11.2.0-1ubuntu1) ...
update-alternatives: using /usr/bin/g++ to provide /usr/bin/c++ (c++) in auto mode
Setting up gfortran (4:11.2.0-1ubuntu1) ...
update-alternatives: using /usr/bin/gfortran to provide /usr/bin/f95 (f95) in auto mode
update-alternatives: using /usr/bin/gfortran to provide /usr/bin/f77 (f77) in auto mode
Setting up libmpich-dev:amd64 (4.0-3) ...
update-alternatives: using /usr/include/x86_64-linux-gnu/mpich to provide /usr/include/x86_64-linux-gnu/mpi (mpi-x86_64-linux-gnu) in auto mode
Processing triggers for man-db (2.10.2-1) ...
Processing triggers for libc-bin (2.35-0ubuntu3.1) ...
(ENV3) tony@tony-VirtualBox:~$ ip install mpi4py -U
Object "install" is unknown, try "ip help".
(ENV3) tony@tony-VirtualBox:~$ pip install mpi4py -U
Collecting mpi4py
  Downloading mpi4py-3.1.5.tar.gz (2.5 MB)
    ━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ 2.5/2.5 MB 334.9 kB/s eta 0:00:00
  Installing build dependencies ... done
  Getting requirements to build wheel ... done
  Preparing metadata (pyproject.toml) ... done
Building wheels for collected packages: mpi4py
  Building wheel for mpi4py (pyproject.toml) ... done
  Created wheel for mpi4py: filename=mpi4py-3.1.5-cp310-linux_x86_64.whl size=2753947 sha256=df8cb1270a05c5ed270bd54ba6081f3cc94898bf9bc5b4d98557002685a1f255
  Stored in directory: /home/tony/.cache/pip/wheels/18/2b/7f/c852523089e9182b45fca50ff56f49a51eeb6284fd25a66713
Successfully built mpi4py
Installing collected packages: mpi4py
Successfully installed mpi4py-3.1.5
(ENV3) tony@tony-VirtualBox:~$ mpiexec -n 4 python -m mpi4py.bench helloworld
Hello, World! I am process 0 of 4 on tony-VirtualBox.
Hello, World! I am process 1 of 4 on tony-VirtualBox.
Hello, World! I am process 2 of 4 on tony-VirtualBox.
Hello, World! I am process 3 of 4 on tony-VirtualBox.

```

Gambar MPI saat berhasil

Penjelasan :

MPI (Message Passing Interface) adalah sebuah antarmuka standar untuk komunikasi antar proses di sistem paralel. MPI menyediakan serangkaian fungsi dan primitif yang dapat digunakan untuk mengirim dan menerima data, serta untuk sinkronisasi proses.

MPI dapat digunakan untuk berbagai aplikasi paralel, seperti:

- Simulasi
- Pemrosesan data besar
- Pembelajaran mesin
- Grafik komputer

MPI adalah alat yang ampuh untuk meningkatkan kinerja aplikasi paralel.