一、确保 linux 系统已经安装：

gcc 编译器、g++编译器、make

否则，在终端执行以下语句安装：

$ sudo apt-get install gcc

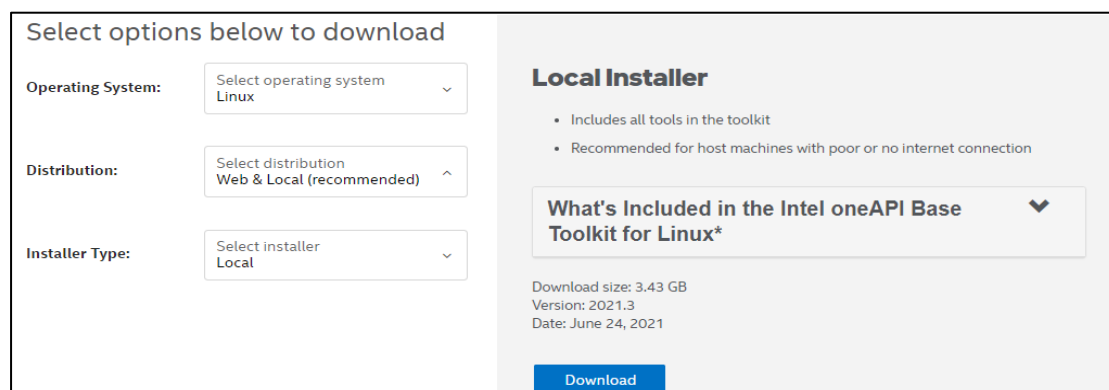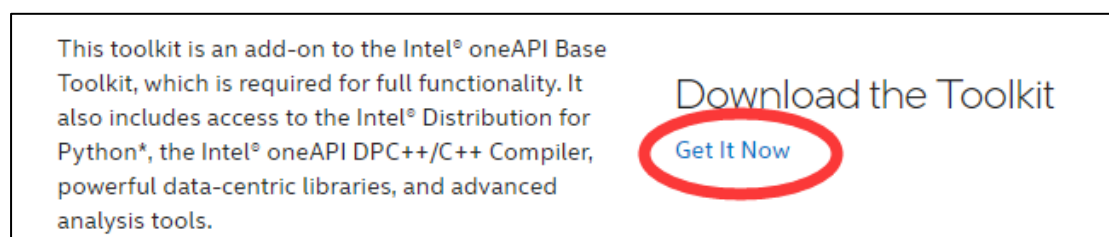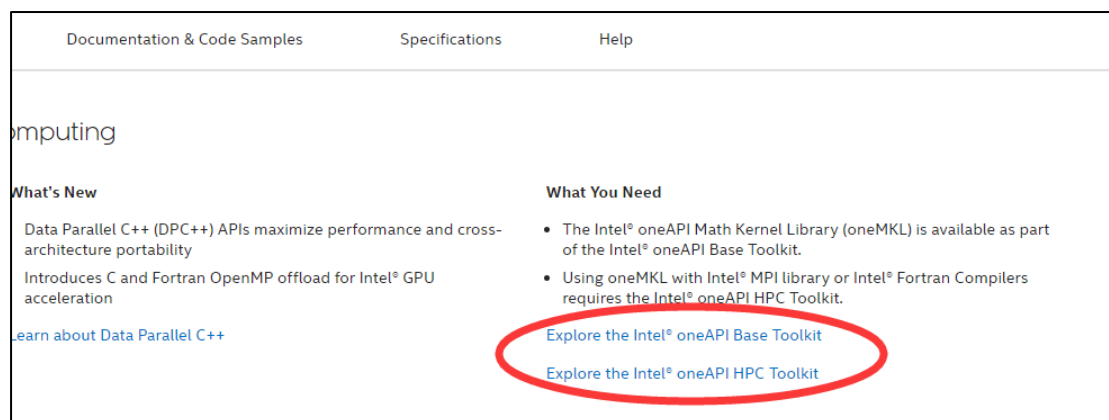$ sudo apt-get install g++

$ sudo apt-get install make

二、在官网

https://software.intel.com/content/www/us/en/develop/tools/oneapi/components/onemkl.html

下载 linux 系统版本的两个安装包：

1. Intel® oneAPI Base Toolkit
2. Intel® oneAPI HPC Toolkit

下载过程示意图如下：

三、安装 l_BaseKit_p_2021.3.0.3219_offline

1. 命令为： sudo sh ./l_BaseKit_p_2021.3.0.3219_offline.sh -s -a --silent --eula accept
2. 安装成功会显示如下图的信息，如果显示 failed 则重启计算机再尝试安装。

四、安装 l_HPCKit_p_2021.3.0.3230_offline.sh

1. 命令为： sudo sh ./l_HPCKit_p_2021.3.0.3230_offline.sh -s -a --silent --eula accept
2. 安装成功会显示如下信息，如果显示 failed 则重启计算机再尝试安装。

四、设置环境变量

source /opt/intel/oneapi/setvars.sh

显示如下信息：

五、检查是否安装成功

1. 在终端输入 mpirun，显示：

```
yuanjianlong@DESKTOP-NNDIC9P:/$ mpirun

Usage: ./mpiexec [global opts] [local opts for exec1] [exec1] [exec1 args] : [local opts for exec2] [exec2] [exec2 args] : ...

Global options (passed to all executables):

  Global environment options:
    -genv {name} {value}           environment variable name and value
    -genvlist {env1,env2,...}      environment variable list to pass
    -genvnone                      do not pass any environment variables
    -genvall                       pass all environment variables not managed
                                        by the launcher (default)

  Other global options:
    -f {name}                      file containing the host names
    -hosts {host list}             comma separated host list

Local options (passed to individual executables):

  Other local options:
    -n/-np {value}                 number of processes
    {exec_name} {args}             executable name and arguments

Hydra specific options (treated as global):

  Launch options:
    -launcher                      launcher to use (ssh slurm rsh ll sge pbsdsh pdsh srun lsf blaunch qrsh fork)
    -launcher-exec                 executable to use to launch processes
    -enable-x/-disable-x           enable or disable X forwarding

  Resource management kernel options:
    -rmk                           resource management kernel to use (slurm ll lsf sge pbs cobalt)

  Processor topology options:
    -bind-to                       process binding
    -map-by                        process mapping
    -membind                       memory binding policy

  Other Hydra options:
    -verbose                       verbose mode
    -info                          build information
    -print-all-exitcodes           print exit codes of all processes
    -ppn                           processes per node
    -prepend-rank                  prepend rank to output
    -prepend-pattern               prepend pattern to output
    -outfile-pattern               direct stdout to file
    -errfile-pattern               direct stderr to file
    -nameserver                    name server information (host:port format)
    -disable-auto-cleanup          don't cleanup processes on error
    -disable-hostname-propagation  let MPICH auto-detect the hostname
    -localhost                     local hostname for the launching node
    -usize                         universe size (SYSTEM, INFINITE, <value>)

Intel(R) MPI Library specific options:

  <option> -help                   show help message for the specific option

  Global options:
    -aps                           Intel(R) Application Performance Snapshot profile
    -mps                           Intel(R) Application Performance Snapshot profile (MPI, OpenMP only)
    -gtool                         tool and rank set
    -gtoolfile                     file containing tool and rank set
    -hosts-group {groups of hosts} allows to set node ranges (like in Slurm* Workload Manager)

  Other Hydra options:
    -iface                         network interface to use
    -s <spec>                      redirect stdin to all or 1,2 or 2-4,6 MPI processes (0 by default)
    -silent-abort                  do not print abort warning message
    -nolocal                       avoid running the application processes on the node where mpiexec.hydra started
    -tune {binary file}            defines the name of binary tuning file
    -print-rank-map                print rank mapping

Intel(R) MPI Library, Version 2021.3  Build 20210601 (id: 6f90181f1)
Copyright 2003-2021 Intel Corporation.
```

2. 在终端输入：ifort -v

```
yuanjianlong@DESKTOP-NNDIC9P:/$ ifort -v
ifort version 2021.3.0
yuanjianlong@DESKTOP-NNDIC9P:/$
```

六．常见问题

1. 问题：在新终端上无法执行 mpirun

   推测原因：环境变量设置不正确

   解决方案：

   1）在终端输入：vi ~/.bashrc

   2）在底部加上环境变量语句：

   export INTEL_PATH=/opt/intel/oneapi/mpi/2021.3.0

```
export PATH=$PATH:$INTEL_PATH/bin
```

3）保存并退出~/.bashrc

4）环境变量生效，执行：

```
source ~/.bashrc
mpicc
```

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