

Installing MPI and mpi4py on Windows and macOS

Introduction

This document provides a short guide for installing MPI and the Python package `mpi4py` on both Windows and macOS. On Windows, the recommended MPI implementation is **Microsoft MPI (MS-MPI)**. On macOS, the recommended MPI implementation is **OpenMPI**.

1. Windows Installation

1.1 Install Microsoft MPI

Download and install the following packages from Microsoft's official website:

- **MS-MPI Runtime**
- **MS-MPI SDK**

Download page: <https://www.microsoft.com/en-us/download/details.aspx?id=100593>
Once installed, tools such as `mpiexec.exe` will be added to your system PATH.

To verify:

```
mpiexec -n 4 hostname
```

1.2 Install mpi4py

Install using pip:

```
pip install mpi4py
```

2. macOS Installation

The simplest way to install OpenMPI and `mpi4py` in macOS is via using Homebrew¹. Use the command:

```
brew install mpi4py
```

This installs both OpenMPI and `mpi4py`. This is sufficient if you use Homebrew's Python. If you want to use `mpi4py` with another Python (virtual environment or another system-wide python), run the following with the Python interpreter you will use (after installation with Homebrew):

```
python3 -m pip install mpi4py
```

¹<https://brew.sh/>

3. Running an MPI Program

After installing the suitable MPI distribution and mpi4py, create an example python file `hello.py`:

```
from mpi4py import MPI
comm = MPI.COMM_WORLD
print("Hello from rank", comm.Get_rank())
```

Run with:

```
mpiexec -n 4 python hello.py
```