



# Intel® Distribution for Python\*

## 2021 Release 3

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*Release Notes*

18 June 2021

## Version History/Revision History

Date	Revision	Description
18 June 2021	1.0	Release Notes for the Intel® Distribution for Python* 2021 Release 3

## Intended Audience

The target audience for the release notes are software developers and end users of the Intel® Distribution for Python\* 2021 Release 3.

## Customer Support

For technical support, including answers to questions not addressed in this document, visit the technical support forum at <https://software.intel.com/en-us/forums/intel-distribution-for-python> or email Intel Corporation at [scripting@intel.com](mailto:scripting@intel.com).

## Contents

1	<a href="#">Introduction</a>	4
2	<a href="#">New in this Release</a>	4
3	<a href="#">System Requirements</a>	5
4	<a href="#">Installation</a>	7
5	<a href="#">Release Content</a>	8
6	<a href="#">Known Issues</a>	11
7	<a href="#">Related Documentation</a>	11
8	<a href="#">Legal Information</a>	13

## 1 Introduction

The Python\* programming language is an open source programming language with increasing adoption by developers across many application domains and a large ecosystem of available free packages. In particular, the packages commonly used for numerical and scientific computation, called the [SciPy](#) stack, are very popular and heavily used.

Intel® Distribution for Python\* is a binary distribution of Python interpreter and commonly used packages for computation and data intensive domains, such as scientific and engineering computing, big data, and data science. The product supports Python 3.7 for Windows and Linux. The product simplifies Python installation by providing packages in a binary form so that everything is preconfigured and no compilation tools are needed, as well as contains all the dependences for running on popular OS platforms. Python packages have been accelerated with Intel® Performance Libraries, including [Intel® Math Kernel Library \(Intel® MKL\)](#), [Intel® Threading Building Blocks \(Intel® TBB\)](#), [Intel® Integrated Performance Primitives \(Intel® IPP\)](#), and [Intel® Data Analytics Acceleration Library \(Intel® DAAL\)](#). The packages have been optimized to take advantage of parallelism through the use of vectorization, multi-threading and multi-processing, as well as through the use of optimized communication across multiple nodes.

This document provides system requirements, installation instructions, and lists issues and limitations.

To learn more about this product, see:

- New features in the [New in this Release](#) section below, or in the product help.
- Reference documentation in the [Related Documentation](#) section below
- Installation instructions in the [Installing this Release](#) section below

## 2 New in this Release

### 2.1 Intel® Distribution for Python 2021 Update 3

The following are new features for the release:

- DPC++ Compiler Conda Packages on Anaconda Cloud
  - Developers can now use the DPC++ compiler in their conda recipes by passing 'dpcpp' to 'compiler()', a special function defined by conda-build to dynamically specify the compiler package to use
  - Refer to Install Guide for details
- SDC
  - Extended pandas API support with subset of index types
  - Improvements to reduce compilation time of pandas DataFrames methods

- Numba-dppy
  - Experimental support for native floating-point atomics on supported SYCL devices
  - Support for Intel GPU profiling tools (Advisor, pti-gpu) on Level Zero devices.
  - Setting optimization level is now supported using an environment variable.
  - Several improvements to debugging kernel functions using GDB.
  - Official support for Python 3.8.
  - Updated packages: Numba 0.53, dpctl 0.8, dpnp 0.6.
  - Improved error messages when lowering fails for parfor regions (numba-dppy now let's users know on which device the lowering failed).
  - Improvements to documentation: user guides and developer guides.
  - Improvements to examples showing how to offload a kernel to different types of SYCL devices.
  - Various bugfixes and other code quality improvements.
- Dpctl
  - Dptensor is renamed to tensor and included a new usm\_ndarray data container conforming to data-apis.org standard and supporting `__sycl_usm_array_interface__` protocol.
  - Several API changes to make the Python API closer to SYCL's C++ API.
  - Support for filter selectors and the default SYCL device selectors.
  - Support for sub-devices and tiles.
  - The Python API now lets a user query various SYCL device aspects supported by DPC++.
  - Support for explicit SYCL context and SYCL queue creation.
  - Level zero program creation is now supported on Windows.
  - Various bugfixes and code quality improvements. PEP8 compliance (with minor exceptions), automated code coverage, Bandit security checks.
  - Improvements to API documentation and examples.

The full list of provided packages is in [Release Content](#).

### 3 System Requirements

The Intel® Distribution for Python\* supports the Intel® 64 architecture. For a complete explanation of this architecture name please read the following article:

[Intel® Architecture Platform Terminology for Development Tools](#).

The lists below pertain only to the system requirements necessary to support application development with Intel® Distribution for Python\*. If you are using Cython\*, please review the documentation for your compiler (GCC\*, Microsoft Visual Studio\*, or Intel® Compiler) to determine the minimum hardware and software requirements.

## Minimum System Requirements

- A system based on an Intel® 64 architecture processor supporting the Intel® Streaming SIMD Extensions 4.2 (Intel® SSE4.2) instructions (or compatible non-Intel® processor).

### NOTE:

- Incompatible or proprietary instructions in non-Intel® processors may cause the analysis capabilities of this product to function incorrectly. Any attempt to analyze code not supported by Intel® processors may lead to failures in this product.
- For the best experience, a multi-core or multiprocessor system is recommended.
- 2GB free disk space for all product features and all architectures
- Supported operating systems:
  - Windows 10\*
  - Windows 8\*
  - Windows 8.1\*
  - Windows 7\*
  - Note:** SP1 is required for use of Intel® Advanced Vector Extensions (Intel® AVX)
  - Windows Server\* 2008 R2 SP1 and SP2
  - Windows HPC Server 2008 R2
  - Windows Server\* 2012
  - Windows Server\* 2016
  - Red Hat\* Enterprise Linux\* 7
  - Fedora\* core 25
  - Fedora\* core 26
  - SUSE Linux Enterprise Server\* 11
  - SUSE Linux Enterprise Server\* 12
  - Debian\* GNU/Linux 8
  - Debian\* GNU/Linux 9
  - Ubuntu\* 16.04 LTS
  - Ubuntu\* 17.04
  - Ubuntu\* 17.10
  - Ubuntu\* 18.04
  - Ubuntu\* 20.04

**Note:** Intel® Distribution for Python\* is expected to work on many more Linux distributions as well. Let us know if you have trouble with the distribution you use.

## External Dependencies

For **Windows\***: None

For **Linux\***: glibc 2.14-2.29 supported

## 4 Installation

### Installing this Release

The Intel® Distribution for Python\* is compatible with the Conda\* package management tool. All modules included in the distribution are initially installed into the root Conda\* environment. A virtual environment is also created.

On **Windows\*** (if using the standalone installer):

1. Change directory to the installation path. Ensure **intelpython** does not exist
2. Download the zip file for Intel® Distribution for Python\* and unzip the file post-download.
3. Change directory to **intelpython**
4. Run from command prompt: **cmd /c setup\_intel\_python.bat**
5. When the installation completes, activate your root Intel® python conda environment:
  - To modify only your current command shell, use the following command:
    - **.\Scripts\activate**

On **Linux/macOS\*** (if using the standalone installer):

1. Change directory to the installation path. Ensure **intelpython** does not exist
2. Download the tarball for Intel® Distribution for Python\* and un-tar the file post-download.
3. Extract the contents using the following command:  
`tar -xvzf <filename>`
4. Change directory to **intelpython**
5. Run from shell: **bash setup\_intel\_python.sh**
6. When the installation completes, activate your root Intel® python conda environment:
  - To modify only your current shell, use the following commands:
    - **source ./bin/activate root**
  - To modify all future logins, do one of the following:
    - Add "source <install>/bin/activate root" to your .bashrc (bash) or other logon script.
    - Manually add the <install>/bin directory to your PATH.
  - Use the following command to ensure your environment points to the Intel® Distribution for Python\*:  
run "**which python**"

### Default Installation Folders

The Intel® oneAPI installer uses the Intel® oneAPI Toolkit installation root, which is /opt/intel/oneapi by default. Intel® Distribution for Python\* standalone installer uses the current directory as the installation root. Intel® Distribution for Python\* is installed under the installation root (<installdir>) in <installdir>/**intelpython/python3.7**. Installation into a directory containing files is not supported.

## Changing, Updating, or Removing the Product

The installer always adds new conda packages to the `conda_channel` directory included in Intel® oneAPI, located by default at `/opt/intel/oneapi/conda_channel`. That directory is initially added to your conda configuration file (`.condarc`). If a root python environment does not exist at `<installdir>/intelpython/python3.7`, the installer will create a new python root environment there. **The installer will NOT modify a pre-existing python root environment.** To update your python root environment, use the conda commands listed following the next paragraph. All releases, including updates, will create a *virtual environment* in `<installdir>/intelpython/releases/` containing all new release content.

**Intel® Distribution for Python\* removal:** On **Windows\*** or **Linux\***: Delete the installation directory and remove additions to your PATH.

You can also use the Conda\* package management tool to update individual modules. You can find the Conda\* tool in the `bin` directory on Linux\* or in the `Scripts` directory on Windows\*. Use these commands to do the following with the Conda\* tool:

- To install a new module: `conda install <module name>`
- To update an existing module: `conda update <module name>`
- To remove an existing module: `conda remove <module name>`

## 5 Release Content

Intel® Distribution for Python\* packages (New\*, Updated\*\*)

Name	Version	Platform
arrow-cpp	2.0.0**	Linux,Windows
asn1crypto	1.4.0	Linux,Windows,macOS
brotli	1.0.9**	Linux,Windows,macOS
bzip2	1.0.8	Linux,Windows,macOS
c_ares	1.17.1**	Linux,Windows,macOS
certifi	2020.12.5**	Linux,Windows,macOS
cffi	1.14.5**	Linux,Windows,macOS
charset	4.0.0**	Linux,Windows,macOS
common_cmplr_lib_rt	2021.3.0**	Linux,Windows,macOS
conda	4.9.2**	Linux,Windows,macOS
conda-package-handling	1.4.1	Linux,Windows,macOS
cryptography	3.3.2**	Linux,Windows,macOS
cycler	0.10.0	Linux,Windows,macOS
cython	0.29.23**	Linux,Windows,macOS
dal	2021.3.0**	Linux,Windows,macOS
double_conversion	3.1.5**	Linux,Windows,macOS



dpcpp_cpp_rt	2021.3.0**	Linux,Windows,macOS
dpctl	0.8.0**	Linux,Windows
dnpn	0.6.2**	Linux
fortran_rt	2021.3.0**	Linux,Windows,macOS
freetype	2.10.4	Linux,Windows,macOS
funcsigs	1.0.2	Linux,Windows,macOS
future	0.18.2**	Linux,Windows,macOS
gflags	2.2.2**	Linux,Windows,macOS
glog	0.4.0**	Linux,Windows,macOS
grpc_cpp	1.26.0**	Linux,Windows,macOS
icc_rt	2021.3.0**	Linux,Windows,macOS
idna	2.10	Linux,Windows,macOS
impi_rt	2021.3.0**	Linux,Windows,macOS
intel-openmp	2021.3.0**	Linux,Windows,macOS
intelpython	2021.3.0**	Linux,Windows,macOS
ipp	2021.3.0**	Linux,Windows,macOS
joblib	1.0.1**	Linux,Windows,macOS
kiwisolver	1.3.1**	Linux,Windows,macOS
libarchive	3.4.2	Linux,Windows,macOS
libcxx	11.0.1	macOS
libevent	2.1.10**	Linux,Windows,macOS
libffi	3.3	Linux,macOS
libgcc-ng	9.3.0**	Linux
libiconv	1.16*	Windows,macOS
libllvm10	10.0.1**	Linux,Windows,macOS
libpng	1.6.37	Linux,Windows,macOS
libprotobuf	3.14.0**	Linux,Windows,macOS
libstdcxx-ng	9.3.0**	Linux
libthrift	0.14.1**	Linux,Windows,macOS
libxml2	2.9.12**	Linux,Windows,macOS
llvmdev	10.0.1**	Linux
llvmlite	0.34.0**	Linux,Windows,macOS
llvm-spirv	10.0.1**	Linux
lz4-c	1.9.3**	Linux,Windows,macOS
lzo	2.10	Linux,Windows,macOS
matplotlib	3.1.2	Linux,Windows,macOS
menuinst	1.4.16	Windows
mkl	2021.3.0**	Linux,Windows,macOS
mkl-service	2.4.0**	Linux,Windows,macOS
mkl_umath	0.1.1**	Linux,Windows,macOS
mkl_fft	1.3.0**	Linux,Windows,macOS
mkl_random	1.2.0**	Linux,Windows,macOS
mpi4py	3.0.3	Linux,Windows
numba	0.53.1**	Linux,Windows,macOS

numba-dppy	0.14.3**	Linux,Windows,macOS
numexpr	2.7.3**	Linux,Windows,macOS
numpy	1.20.3**	Linux,Windows,macOS
numpy-base	1.20.3**	Linux,Windows,macOS
opencl_rt	2021.3.0**	Linux,Windows
openssl	1.1.1k**	Linux,Windows,macOS
orc	1.6.6*	Linux,macOS
pandas	1.2.0**	Linux,Windows,macOS
pip	20.2.3	Linux,Windows,macOS
pyarrow	2.0.0**	Linux,Windows,macOS
pycosat	0.6.3	Linux,Windows,macOS
pycparser	2.20	Linux,Windows,macOS
pyopenssl	20.0.1**	Linux,Windows,macOS
pyarsing	2.4.7	Linux,Windows,macOS
pysocks	1.7.0	Linux,Windows,macOS
python	3.7.9**	Linux,Windows,macOS
python-dateutil	2.8.1	Linux,Windows,macOS
python-libarchive-c	2.8	Linux,Windows,macOS
pytz	2021.1**	Linux,Windows,macOS
pywin32	227	Windows
pyyaml	5.3.1	Linux,Windows,macOS
requests	2.25.1**	Linux,Windows,macOS
ruamel_yaml	0.15.99	Linux,Windows,macOS
scikit-ipp	1.2.0	Linux,Windows,macOS
scikit-learn	0.24.2**	Linux,Windows,macOS
scikit-learn-intelex	2021.3.0**	
scipy	1.6.2**	Linux,Windows,macOS
sdc	0.39.0**	Linux,Windows
setuptools	52.0.0**	Linux,Windows,macOS
six	1.16.0**	Linux,Windows,macOS
smp	0.1.4	Linux
snappy	1.1.8	Linux, Windows
spirv-tools	2020.5**	Linux
sqlite	3.35.5	Linux,Windows,macOS
sys_check	2021.3**	Linux,Windows,macOS
tbb	2021.3.0**	Linux,Windows,macOS
tbb4py	2021.3.0**	Linux,Windows,macOS
tcl	8.6.9	Linux,Windows,macOS
threadpoolctl	2.1.0	Linux,Windows,macOS
thrift-cpp	0.14.1**	Linux,Windows
tk	8.6.9	Linux,Windows,macOS
tqdm	4.50.2**	Linux,Windows,macOS
uriparser	0.9.3**	Linux,Windows,macOS
urllib3	1.26.4**	Linux,Windows,macOS

vc	14.1	Windows
vs2015_runtime	14.16.27012	Windows
wheel	0.36.2**	Linux,Windows,macOS
win_inet_pton	1.2.0**	Windows
wincertstore	0.2	Windows
xgboost	1.4.2**	Linux
xz	5.2.5	Linux,Windows,macOS
yaml	0.1.7	Linux,Windows,macOS
zlib	1.2.11.1	Linux,Windows,macOS
zstd	1.4.5	Linux,Windows,macOS

The installation package contains all the necessary native libraries required by the packages.

## 6 Known Issues

Please refer to the **Known Issues** in the **Resources** section of the document that is available online:

<https://software.intel.com/en-us/articles/intel-distribution-for-python-support-and-documentation>

## 7 Related Documentation

Name	Documentation
arrow-cpp	<a href="https://github.com/apache/arrow">https://github.com/apache/arrow</a>
asn1crypto	<a href="https://github.com/wbond/asn1crypto">https://github.com/wbond/asn1crypto</a>
bzip2	<a href="http://www.bzip.org/docs.html">http://www.bzip.org/docs.html</a>
certifi	<a href="https://certifi.io">https://certifi.io</a>
cfffi	<a href="http://cfffi.readthedocs.org">http://cfffi.readthedocs.org</a>
chardet	<a href="https://github.com/chardet/chardet">https://github.com/chardet/chardet</a>
conda	<a href="http://conda.pydata.org/docs/">http://conda.pydata.org/docs/</a>
conda-package-handling	<a href="https://github.com/conda/conda-package-handling">https://github.com/conda/conda-package-handling</a>
cryptography	<a href="https://cryptography.io">https://cryptography.io</a>
cycler	<a href="http://matplotlib.org/cycler/">http://matplotlib.org/cycler/</a>
cython	<a href="http://cython.org/#documentation">http://cython.org/#documentation</a>
dpctl	<a href="https://github.com/IntelPython/dpctl">https://github.com/IntelPython/dpctl</a>
dnpnp	<a href="https://github.com/IntelPython/dnpnp">https://github.com/IntelPython/dnpnp</a>
freetype	<a href="http://freetype.sourceforge.net/freetype2/documentation.html">http://freetype.sourceforge.net/freetype2/documentation.html</a>
funcsigs	<a href="http://funcsigs.readthedocs.org/en/latest/">http://funcsigs.readthedocs.org/en/latest/</a>
idna	<a href="https://github.com/kjd/idna">https://github.com/kjd/idna</a>
intel-openmp	<a href="http://software.intel.com">http://software.intel.com</a>
ipp	<a href="http://software.intel.com/en-us/articles/intel-ipp/">http://software.intel.com/en-us/articles/intel-ipp/</a>
joblib	<a href="https://joblib.readthedocs.io/en/latest/">https://joblib.readthedocs.io/en/latest/</a>
kiwisolver	<a href="https://kiwisolver.readthedocs.io/en/latest/">https://kiwisolver.readthedocs.io/en/latest/</a>
libarchive	<a href="http://www.libarchive.org/">http://www.libarchive.org/</a>

libffi	<a href="http://sourceware.org/libffi/">http://sourceware.org/libffi/</a>
libiconv	<a href="https://www.gnu.org/software/libiconv/">https://www.gnu.org/software/libiconv/</a>
libpng	<a href="http://www.libpng.org/pub/png/libpng.html">http://www.libpng.org/pub/png/libpng.html</a>
llvmlite	<a href="https://github.com/numba/llvmlite">https://github.com/numba/llvmlite</a>
lz4-c	<a href="https://www.lz4.org">https://www.lz4.org</a>
lzo	<a href="http://www.oberhumer.com/opensource/lzo/">http://www.oberhumer.com/opensource/lzo/</a>
matplotlib	<a href="http://matplotlib.org/contents.html#">http://matplotlib.org/contents.html#</a>
menuinst	<a href="https://pypi.python.org/pypi/menuinst/">https://pypi.python.org/pypi/menuinst/</a>
mkl	<a href="http://software.intel.com/en-us/articles/intel-mkl/">http://software.intel.com/en-us/articles/intel-mkl/</a>
mkl_fft	<a href="http://github.com/IntelPython/mkl_fft">http://github.com/IntelPython/mkl_fft</a>
mkl_random	<a href="http://github.com/IntelPython/mkl_random">http://github.com/IntelPython/mkl_random</a>
mpi4py	<a href="http://mpi4py.readthedocs.org/">http://mpi4py.readthedocs.org/</a>
numba	<a href="http://numba.pydata.org/">http://numba.pydata.org/</a>
numexpr	<a href="https://github.com/pydata/numexpr/wiki/Numexpr-Users-Guide">https://github.com/pydata/numexpr/wiki/Numexpr-Users-Guide</a>
numpy	<a href="http://numpy.scipy.org/">http://numpy.scipy.org/</a>
openssl	<a href="http://www.openssl.org/">http://www.openssl.org/</a>
pandas	<a href="http://pandas.pydata.org/pandas-docs/stable/">http://pandas.pydata.org/pandas-docs/stable/</a>
pip	<a href="https://pip.pypa.io/en/stable/">https://pip.pypa.io/en/stable/</a>
pyarrow	<a href="https://github.com/apache/arrow">https://github.com/apache/arrow</a>
pycosat	<a href="https://github.com/ContinuumIO/pycosat">https://github.com/ContinuumIO/pycosat</a>
pycparser	<a href="https://github.com/eliben/pycparser">https://github.com/eliben/pycparser</a>
pyopenssl	<a href="https://pyopenssl.readthedocs.org/en/stable/">https://pyopenssl.readthedocs.org/en/stable/</a>
pyparsing	<a href="http://pyparsing.wikispaces.com/Documentation">http://pyparsing.wikispaces.com/Documentation</a>
pysocks	<a href="https://github.com/Anorov/PySocks">https://github.com/Anorov/PySocks</a>
python	<a href="https://www.python.org/doc/versions/">https://www.python.org/doc/versions/</a>
python-dateutil	<a href="https://dateutil.readthedocs.org/en/latest/">https://dateutil.readthedocs.org/en/latest/</a>
python-libarchive-c	<a href="https://github.com/Changaco/python-libarchive-c">https://github.com/Changaco/python-libarchive-c</a>
pytz	<a href="http://pytz.sourceforge.net/">http://pytz.sourceforge.net/</a>
pywin32	<a href="https://github.com/mhammond/pywin32">https://github.com/mhammond/pywin32</a>
pyyaml	<a href="http://pyyaml.org/">http://pyyaml.org/</a>
requests	<a href="http://docs.python-requests.org/">http://docs.python-requests.org/</a>
ruamel_yaml	<a href="https://bitbucket.org/ruamel/yaml">https://bitbucket.org/ruamel/yaml</a>
scikit-learn	<a href="http://scikit-learn.org/stable/">http://scikit-learn.org/stable/</a>
scipy	<a href="http://www.scipy.org/docs.html">http://www.scipy.org/docs.html</a>
sdc	<a href="https://github.com/IntelPython/sdc">https://github.com/IntelPython/sdc</a>
setuptools	<a href="http://pythonhosted.org/setuptools/">http://pythonhosted.org/setuptools/</a>
six	<a href="http://pythonhosted.org/six/">http://pythonhosted.org/six/</a>
smp	<a href="https://github.com/IntelPython/smp">https://github.com/IntelPython/smp</a>
snappy	<a href="https://github.com/google/snappy">https://github.com/google/snappy</a>
sqlite	<a href="http://www.sqlite.org/docs.html">http://www.sqlite.org/docs.html</a>
tbb	<a href="http://www.threadingbuildingblocks.org">http://www.threadingbuildingblocks.org</a>

tcl	<a href="http://www.tcl.tk/doc/">http://www.tcl.tk/doc/</a>
thrift-cpp	<a href="https://github.com/apache/thrift">https://github.com/apache/thrift</a>
tk	<a href="http://www.tcl.tk/doc/">http://www.tcl.tk/doc/</a>
tqdm	<a href="https://pypi.python.org/pypi/tqdm">https://pypi.python.org/pypi/tqdm</a>
urllib3	<a href="https://urllib3.readthedocs.io/">https://urllib3.readthedocs.io/</a>
vc	<a href="https://github.com/conda/conda/wiki/VC-features">https://github.com/conda/conda/wiki/VC-features</a>
vs2015_runtime	<a href="http://www.microsoft.com">http://www.microsoft.com</a>
wheel	<a href="http://wheel.readthedocs.org/en/latest/">http://wheel.readthedocs.org/en/latest/</a>
win_inet_pton	<a href="https://github.com/hickeroar/win_inet_pton">https://github.com/hickeroar/win_inet_pton</a>
wincertstore	<a href="https://bitbucket.org/tiran/wincertstore">https://bitbucket.org/tiran/wincertstore</a>
xgboost	<a href="https://github.com/dmlc/xgboost">https://github.com/dmlc/xgboost</a>
xz	<a href="http://tukaani.org/xz/">http://tukaani.org/xz/</a>
yaml	<a href="http://yaml.org/">http://yaml.org/</a>
zlib	<a href="http://zlib.net/manual.html">http://zlib.net/manual.html</a>

## 8 Legal Information

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Notice Revision #20110804