

OpenStudio Version 3.3.0

Release Notes - 11/05/2021

These release notes describe version 3.3.0 of the OpenStudio SDK developed by the National Renewable Energy Laboratory (NREL), Buildings and Thermal Sciences Center, Commercial Buildings Research Group, Tools Development Section, and associated collaborators. The notes are organized into the following sections:

- Overview
- Where to Find OpenStudio Documentation
- Installation Notes
- OpenStudio SDK: Changelog

Overview

As of April 2020, development and distribution of the OpenStudioApplication and the SketchUp plugin have transitioned to the OpenStudio Coalition, who is independently managing and distributing the software through its own [openstudiocoalition/OpenStudioApplication](https://openstudiocoalition.com/OpenStudioApplication) repository. The OpenStudio SDK is continuing to be actively developed and distributed by NREL and is released two times per year, through a spring and a fall release.

Below is the list of components that is included in this SDK installer:

OpenStudio SDK 3.3.0 - EnergyPlus - Command Line Interface (CLI) - Radiance - Ruby API - C++ SDK

Note that [PAT](#) is not included in either the SDK or the OpenStudio Coalition's Application installers. You will need to install PAT separately which is distributed on the [OpenStudio-PAT](#) GitHub page.

Where to Find OpenStudio SDK Documentation

- OpenStudio SDK release documentation, including these release notes, tutorials, and other user documentation, is available at <https://www.openstudio.net/>
- C++ API documentation is available at <https://openstudio-sdk-documentation.s3.amazonaws.com/index.html>
- Measure development documentation is available at http://nrel.github.io/OpenStudio-user-documentation/reference/measure_writing_guide/
- A roadmap for planned features is available at http://nrel.github.io/OpenStudio-user-documentation/getting_started/roadmap/.

Installation Notes

OpenStudio SDK 3.3.0 is supported on 64-bit Windows 7 – 10, OS X 10.15, and Ubuntu 18.04, 20.04

OpenStudio SDK 3.3.0 supports [EnergyPlus Release 9.6](#), which is bundled with the OpenStudio installer. It is no longer necessary to download and install EnergyPlus separately. Other builds of EnergyPlus are not supported by OpenStudio SDK 3.3.0.

OpenStudio SDK 3.3.0 supports Radiance 5.0.a.12, which is bundled with the OpenStudio installer; users no longer must install Radiance separately, and OpenStudio will use the included Radiance version regardless of any other versions that may be installed on the system. Other builds of Radiance are not supported by OpenStudio SDK 3.3.0.

As usual, you can refer to the [OpenStudio SDK Compatibility Matrix](#) for more information.

Installation Steps

- Download and install [OpenStudio SDK](#) and/or [openstudiocoalition/OpenStudioApplication](#) depending on your needs. Select components for installation. Note that OpenStudio Application is a standalone app and does not require you to install OpenStudio SDK.
- Setup a Building Component Library (BCL) account to access online building components and measures. View instructions on how to setup your account and configure the key in OpenStudio.
- The OpenStudio Application SketchUp Plug-in requires SketchUp 2019 (not available for Linux). The OpenStudio Application SketchUp Plug-in does not support older versions of SketchUp. SketchUp must be installed before OpenStudio Application to automatically activate the plugin. If you install SketchUp after OpenStudio Application, simply re-run the OpenStudio Application installer.

For help with common installation problems please visit, http://nrel.github.io/OpenStudio-user-documentation/getting_started/getting_started/.

OpenStudio SDK: Changelog

The 3.3.0 is a major release. This update includes several new features, performance improvements, and bug fixes. You can find the list of Pull Requests that got into this release [here](#).

Python Bindings

As of OpenStudio SDK 3.2.0, Python bindings are officially supported and distributed through Python Package Index (PyPI). To install, users will need to

have Python3 installed along with pip and simply run the following command in a terminal window.

```
pip install openstudio==3.3.0
```

Please see [openstudio on PyPi](#) for further instructions on how to install. Users can also visit the test channel at <https://test.pypi.org/project/openstudio/> to install development bindings.

New Features, Major Fixes and API-breaking changes

- [#4406](#) - Update to EnergyPlus [v9.6.0_PlusSpaceFix1](#)
 - Experimental Support for the EnergyPlus 9.6.0 [space concept](#) was added
 - * This feature is currently opt-in, either by manually calling `ForwardTranslator::setExcludeSpaceTranslation(false)` before calling `ForwardTranslator::translateModel(Model&)` or passing the CLI argument `--space-translation` to the `run` method (eg: `openstudio run --space-translation -w workflow.osw`)
 - * A few limitations due to DaylightingControls/IlluminanceMap exist: in case one of these objects is found in a ThermalZone, spaces will be combined for that ThermalZone (historical behavior)
 - * [#4471](#) - Space PR: adjustments to make DaylightingControls work
 - * [#4434](#) - Addresses [#4409](#), forward translate Space
 - * [#4447](#) - Add ForwardTranslator options to the CLI `run` method
 - * [#4465](#) - [Developer] Refactor Forward Translation of ThermalZone in particular for Space translation PR
 - **Note:** EnergyPlus due to the Space feature now enforces unicity of names within the Zone, Space, ZoneList and SpaceList objects. **As a result, we are now enforcing this in the `openstudio::model` namespace: the same name can no longer be used for objects of type ThermalZone, Space, SpaceType.**
- [#4350](#) - Fix [#3599](#) - Add new fields to control outdoor air for AirTerminalSingleDuctInletMixer
- [#4365](#) - Addresses [#4364](#), Availability Schedule for DaylightingControl
- [#4342](#) - Fix [#4327](#) - FanSystemModel electricPowerFraction should be optional
- [#4368](#) - Addresses [#4362](#), add support of HeatPump:PlantLoop:EIR:Heating and HeatPump:PlantLoop:EIR:Cooling to model air-to-water heat pump
- [#4382](#) - Addresses [#4380](#), completing SDK support of Tubular and Light Well Daylighting Devices
- [#4381](#) - Addresses [#3906](#), support new field 'Minimum Air Flow Turndown Schedule Name' for AirTerminals
- [#4407](#) - Add AirLoopHVAC to ThreeJS user data by @antoine-galataud

- [#4402](#) - Addresses [#3910](#), realign OS:SizingPeriod:DesignDay with E+ IDD
- [#4417](#) - Fix [#4156](#) - Support nested subfolders in approved Measure directories
- [#4452](#) - Fix [#4448](#) - Issues with angles in DaylightingControl
- [#4317](#) - Addresses [#3147](#), add HeatExchanger:Desiccant:BalancedFlow
- [#4326](#) - Fix Wrap E+ WaterHeater:Sizing object
- [#4319](#) - Fix Wrap E+ FuelFactors object
- [#4418](#) - Resolves [#4395](#) Add in CLI option to use epJSON
- [#4347](#) - Fix [#227](#) - Actually use the EPW start year or start day of week when “UseWeatherFile” is used in YearDescription for assumedYear
 - Please note that before, while the IDD default was `UseWeatherFile`, it would typically use the Assumed Base Year instead (2009) which resulted in using `Thursday` as a Start Day of Week for simulation. Depending on your weather file, you might experience a different Start Day of Week which could lead to slight EUI deviations. More information can be seen on [NREL/OpenStudio-resources#153](#)
- [#4389](#) - Update BCL to use BCL2 (<https://bcl2.nrel.gov/>)

Minor changes and bug fixes

- [#4349](#) - Fix [#3514](#) - Make strings returned from openstudio to ruby UTF8
- [#4346](#) - Addresses [#4329](#) and [#4330](#), issues with AirLoopHVAC:UnitaryHeatCool:VAVChangeoverBypass
- [#4356](#) - Fix [#4353](#) - Add a missing reference in E+ Idd for PythonPlugin:Instance (`ProgramNames`)
- [#4355](#) - Fix [#4354](#) - Issue AirLoopHVACOutdoorAirSystem::reliefComponents with ZoneHVACComponents: wrong order
- [#4348](#) - Fix [#2145](#) - Do not create an extra singlezone SPM humidity min created if humidifier downstream of fan
- [#4343](#) - Fix [#4335](#) - Should reset the air nodes when cloning a AirLoopHVACUnitarySystem
- [#4345](#) - [#4046](#) - Clarify the situation with output file in the Reporting-Measure Template
- [#4339](#) - Fix [#4338](#) - AirLoopHVAC_Impl::terminalForLastBranch doesn't handle Dual duct correctly
- [#4359](#) - Addresses [#4314](#), add ScheduleRuleset custom day methods
- [#4352](#) - Fix [#1571](#) - building.clone breaks space surface matching
- [#4378](#) - Addresses [#1515](#), Reverse Translator should retain thermal zone name from IDF instead of re-naming it
- [#4385](#) - Fixes Crash in floorplanToThreeJS <https://github.com/NREL/OpenStudio/issues/4384>
- [#4398](#) - ref [#4397](#) - Fix some issues in our Init calls for embedded ruby
- [#4305](#) - Fix [#4304](#) - Minimal fix for GroundHeatExchanger:Vertical to avoid confusion between maximum and design flow rates
- [#4400](#) - [#4399](#) - Surface fixes
- [#4392](#) - Fix [#4390](#) - add OSRunner::getOptionalBoolArgumentValue

- [#4420](#) - Fix [#4419](#) - custom mapping for LCC Use Price Escalation
- [#4428](#) - Avoid issues with openstudio_ruby revision not matching
- [#4440](#) - Fix [#4439](#) - Correctly Reverse Translate gbXML Schedules
- [#4450](#) - Fix [#4446](#) - add SizingSystem::autosizedOccupantDiversity.
- [#4454](#) - Fix [#4404](#) [#4453](#) - Fix issues with ForwardTranslator options
- [#4431](#) - Fixed an issue in Surface splitSurfaceForSubSurfaces
- [#4459](#) - Fix [#3426](#) - ZoneHVACUnitHeater components missing air inlet/outlet node names when Fan:OnOff
- [#4455](#) - Fix [#4445](#) - Fix API issues in Controller:WaterCoil
- [#4462](#) - Fix [#4461](#) - DesignSpecificationOutdoorAir: when combining, Outdoor Air Flow rate for ACH is off by 3600 when “Maximum” method is used
- [#4473](#) - Fix [#4472](#) - Modify Python in typemaps for `path` to accept string with Python 3 support
- [#4307](#) - Standardize Curve IDD references like E+ does (Uni/Bi . . variateFunctions) and remove hard check in model code
- [#4337](#) - Fix Encode searchTerm in BCL (including spaces, not only “+” signs)
- [#4344](#) - Update openstudio-gems for new versions: openstudio-extension-gem (v0.5.1), openstudio-workflow-gem (v2.3.1) and openstudio-standards (v0.2.15)
- [#4332](#) - Fix StringHelpers openstudio::replace
- [#4324](#) - Fix Do not Warn if Sql doesn’t have a Year field
- [#4376](#) - Fix [#4309](#) - disable RUBYLIB env and use `--include` or `-I` using cli

Developer changes:

- [#4401](#) - Update to new stable tag from Github Actions CI (includes CP720 fix)
- [#4476](#) - Update gems for workflow and extension gem updates
- [#4463](#) - Add a full FT test for DaylightingControls (backport from Space PR)
- [#4467](#) - Update unit tests for ElectricEquipmentITEAirCooled
- [#4383](#) - Provide more options for installation of openstudio dlls
- [#4302](#) - Fix Deprecation Warning of last argument as keyword parameters
- [#4421](#) - Fix [#4220](#) - Don’t pass built in POD types by const ref& but by value
- [#4371](#) - Github Actions to publish python bindings to pypi when it’s a release and testing worked
- [#4466](#) - Add Full detailed tests for the FT of SpaceInfiltration objects (whether assigned to space or spacetype)
- [#4468](#) - Add a full FT test for ElectricEquipmentITEAirCooled (backport Space PR)
- [#4427](#) - Fix [#4423](#) - enable coverage on one of the linux runners
- [#4369](#) - [#4214](#) Add in automated testing for 32/64 bit nuget package

OpenStudio Standards v0.2.15

- [#1153](#) - Fix error handling in thermal zone occupancy schedule method
- [#1160](#) - Fix HPWH capacity fix
- [#1123](#) - Updated documentation to cover all methods [#1123](#)
- [#1131](#) - Updated gem dependencies to resolve security issues [#1131](#)
- [#1120](#) - Added college building prototype [#1120](#)
- [#1117](#) - Fixed bug in `schedule_compact_annual_min_max_value` method [#1117](#)
- [#1113](#) - Disable sizing run periods after sizing run [#1113](#)
- Added new requirements for ASHRAE Standard 90.1-2019:
 - Hotel guest room ventilation and thermostat control
 - Update to freezer and reach-in refrigerator efficiency
 - Multi-zone system temperature supply applied to warm and humid climate zones
 - Update to computer room air-conditioning efficiency
 - Update to walk-in cooler and freezer efficiency
 - Update to damper leakage rate requirements
 - Added clean water pumps requirements
 - Update to boiler and furnace efficiency
 - Added logic to implement occupant standby mode control requirements
 - Updated daylighting control dimming requirements
 - Added non-transient dwelling units energy recovery based on enthalpy recovery ratio
 - Added ASHRAE Standard 62.1-2019 Simplified Procedure

OpenStudio Server v3.3.0

- [#633](#) - Merge urbanopt/reopt
- [#634](#) - Fix in.osm not downloadable
- [#635](#) - Bump puma version for security
- [#636](#) - Add docker container scanning using Trivy

Issue Statistics Since Previous Release

[116 Closed Issues](#) [99 New Issues](#)