

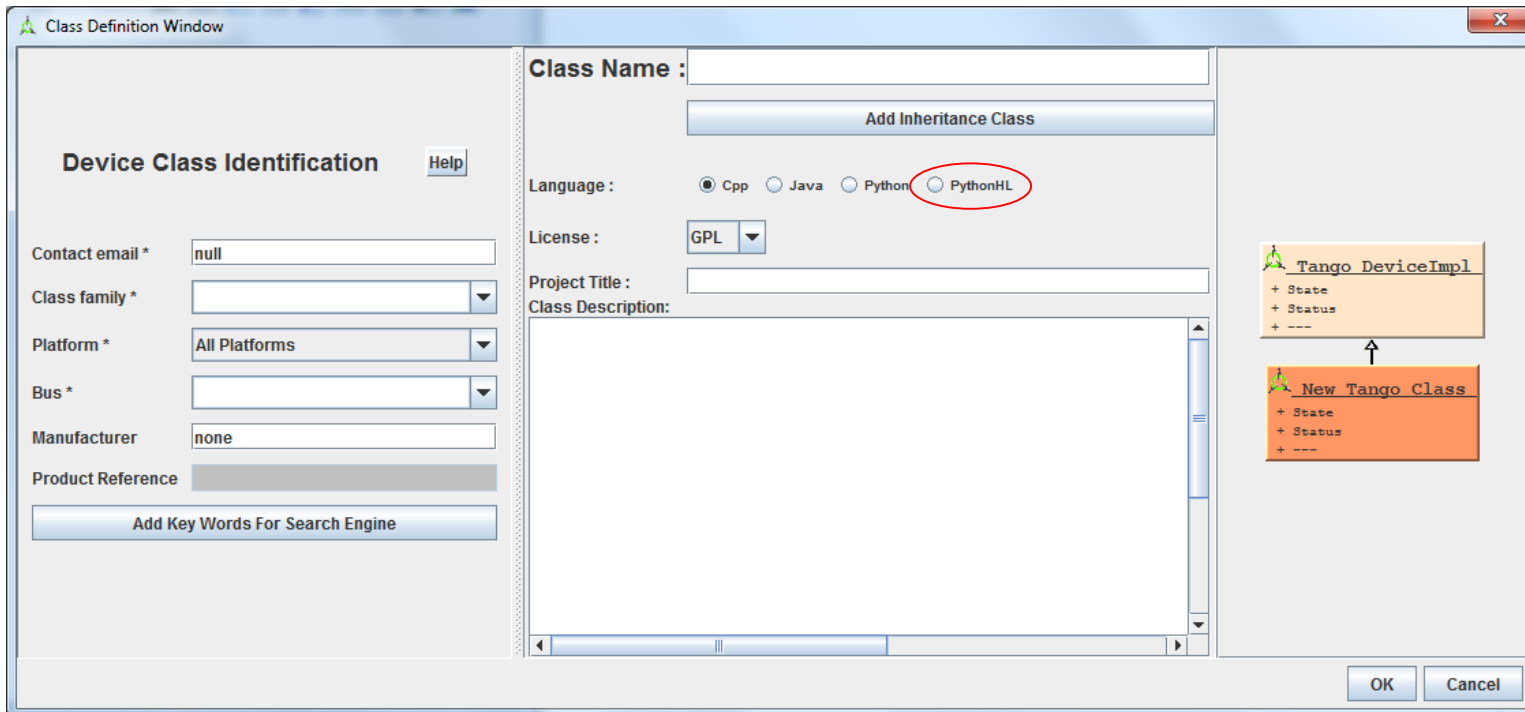
NEXEYA

■ Pogo 9 - Python  
TANGO Meeting – Krakow  
2015 May

## ❑ Pogo 9 - Python

### ■ Improvements

- Fixes on the current python template
- Addition of the python HL template  
PEP8 compatible



# ■ Pogo 9 - Python

```

# -*- coding: utf-8 -*-
#
# This file is part of the PyTango HL API project
#
# Copyright (c) : 2014
# Beamline Control Unit, European Synchrotron Radiation Facility
# BP 220, Grenoble 38043
# FRANCE
#
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# See LICENSE.txt for more info.

""" PyTango HL Example

An example class of a PyTango HL API
"""

__all__ = ["PyHL", "main"]

# PyTango imports
import PyTango
from PyTango import DebugIt
from PyTango.server import run
from PyTango.server import Device, DeviceMeta
from PyTango.server import attribute, command
from PyTango.server import class_property, device_property
from PyTango import AttrQuality, AttrWriteType, DispLevel
# Additional import
# PROTECTED REGION ID(PyHL.additional_import) ENABLED START #
# PROTECTED REGION END # .....PyHL.additional_import

class PyHL(Device):
    """
    """
    """ An example class of a PyTango HL API
    """
    """
    """
    __metaclass__ = DeviceMeta
    """ # PROTECTED REGION ID(PyHL.class_variable) ENABLED START #
    """ # PROTECTED REGION END # .....PyHL.class_variable
    """
    """ # Class Properties
    """ # -----

    Test = class_property(
        dtype='str', default_value="Test"
    )

```

```

    """ # -----
    """ # Device Properties
    """ # -----

    Test22 = device_property(
        dtype='uint16', default_value=1
    )

    """ # -----
    """ # Attributes
    """ # -----

    scalar_double_ro = attribute(
        dtype='double',
    )

    scalar_double_rw = attribute(
        dtype='double',
        access=AttrWriteType.READ_WRITE,
        display_level=DispLevel.EXPERT,
    )

    scalar_string_ro = attribute(
        dtype='str',
    )

    devencoded_ro = attribute(
        dtype='bytearray',
    )

    image_short_ro = attribute(
        dtype=('int16',),
        max_dim_x=2000, max_dim_y=2000,
    )

    """ # -----
    """ # General methods
    """ # -----

    def init_device(self):
        Device.init_device(self)
        """ # PROTECTED REGION ID(PyHL.init_device) ENABLED START #
        """ # PROTECTED REGION END # .....PyHL.init_device

    def always_executed_hook(self):

```

# ■ Pogo 9 - Python

```

##### # PROTECTED REGION ID(PyHL.always_executed_hook) ENABLED START #
##### pass
##### # PROTECTED REGION END #-----// PyHL.always_executed_hook

##### def delete_device(self):
##### # PROTECTED REGION ID(PyHL.delete_device) ENABLED START #
##### pass
##### # PROTECTED REGION END #-----// PyHL.delete_device
##### # -----
##### # Attributes methods
##### # -----

##### def read_scalar_double_ro(self):
##### # PROTECTED REGION ID(PyHL.scalar_double_ro_read) ENABLED START #
##### return 0.0
##### # PROTECTED REGION END #-----// PyHL.scalar_double_ro_read

##### def read_scalar_double_rw(self):
##### # PROTECTED REGION ID(PyHL.scalar_double_rw_read) ENABLED START #
##### return 0.0
##### # PROTECTED REGION END #-----// PyHL.scalar_double_rw_read

##### def write_scalar_double_rw(self, value):
##### # PROTECTED REGION ID(PyHL.scalar_double_rw_write) ENABLED START #
##### pass
##### # PROTECTED REGION END #-----// PyHL.scalar_double_rw_write

##### def read_scalar_string_ro(self):
##### # PROTECTED REGION ID(PyHL.scalar_string_ro_read) ENABLED START #
##### return ''
##### # PROTECTED REGION END #-----// PyHL.scalar_string_ro_read

##### def read_devencoded_ro(self):
##### # PROTECTED REGION ID(PyHL.devencoded_ro_read) ENABLED START #
##### return '#12'
##### # PROTECTED REGION END #-----// PyHL.devencoded_ro_read

##### def read_image_short_ro(self):
##### # PROTECTED REGION ID(PyHL.image_short_ro_read) ENABLED START #
##### return [[0]]
##### # PROTECTED REGION END #-----// PyHL.image_short_ro_read

##### # -----
##### # Commands
##### # -----

```

```

##### @DebugIt ()
##### @command
##### def CmdTest(self):
##### # PROTECTED REGION ID(PyHL.CmdTest) ENABLED START #
##### pass
##### # PROTECTED REGION END #-----// PyHL.CmdTest

##### @DebugIt ()
##### @command(dtype_in='str', doc_in="Input string", dtype_out='str', doc_out="Output string")
##### def CmdArg(self, argin):
##### # PROTECTED REGION ID(PyHL.CmdArg) ENABLED START #
##### return ""
##### # PROTECTED REGION END #-----// PyHL.CmdArg

##### # -----
##### # Run server
##### # -----

def main():
##### from PyTango.server import run
##### run((PyHL,))

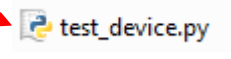
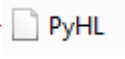
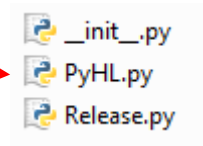
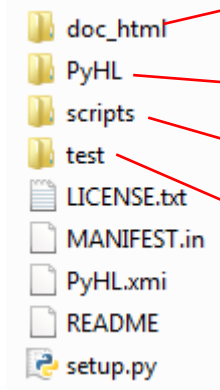
if __name__ == '__main__':
##### main()

```

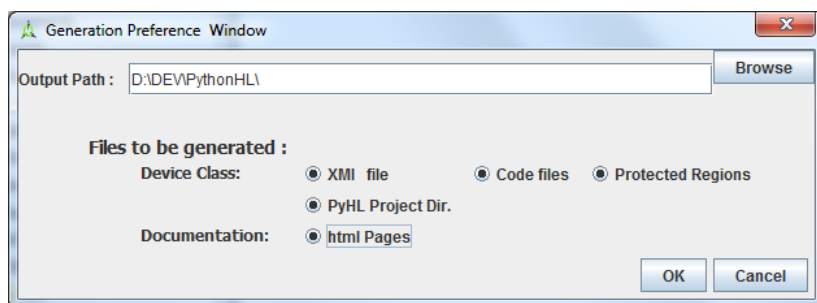
# Python 9 - Python

## Python HL options

- Protected regions
- Project directory



- Attrdevencoded\_ro.html
- Attributes.html
- Attrimage\_short\_ro.html
- Attrscalar\_double\_ro.html
- Attrscalar\_double\_rw.html
- Attrscalar\_string\_ro.html
- ClassDescription.html
- CmdCmdArg.html
- CmdCmdTest.html
- CmdState.html
- CmdStatus.html
- Commands.html
- FullDocument.html
- index.html
- Properties.html
- States.html
- TitleBanner.html



## ▣ Pogo 9 - Python

### ■ DeviceName directory

#### ▪ `__init__.py`

```
from . import Release
from .DeviceName import DeviceName, main
__version__ = Release.version
__version_info__ = Release.version
_info __author__ = Release.author
```

#### ▪ `DeviceName.py`

#### ▪ `Release.py`

```
name = """DeviceName Example"""
version = "1.0"
version_info = version.split(".")
description = """An example class of a PyTango HL API"""
author = "coutinho"
author_email = "coutinho at esrf.fr"
license = """LGPL"""
url = ""
copyright = """Copyright (c) : 2014 Beamline Control Unit,
European Synchrotron Radiation Facility BP 220, Grenoble 38043
FRANCE"""
```

## ❑ Pogo 9 - Python

### ■ scripts

#### ▪ DeviceName

```
#!/usr/bin/env python
# -*- coding: utf-8 -*-

try:
    from DeviceName import main
except ImportError:
    import os, sys
    __this_dir = os.path.dirname(os.path.abspath(__file__))
    __package_dir = os.path.join(__this_dir, os.path.pardir)
    sys.path.append(__package_dir)
    from DeviceName import main

if __name__ == "__main__":
    main()
```

## ▣ Pogo 9 - Python

### ■ tests

#### ▪ test\_device.py

Use of devicetest package from Max-IV (by Vincent Michel from Nexeya)

Just adapt the test script file (in the protected regions, if enabled)

Run the test\_device script

Look at the output



# ■ Pogo 9 - Python

```

# Path
import sys
import os
path = os.path.join(os.path.dirname(__file__), os.pardir)
sys.path.insert(0, os.path.abspath(path))

# Imports
from time import sleep
from mock import MagicMock
from PyTango import DevFailed, DevState
from devicetest import DeviceTestCase, main
from PyHL import PyHL

# Note:
#
# Since the device uses an inner thread, it is necessary to
# wait during the tests in order to let the device update itself.
# Hence, the sleep calls have to be secured enough not to produce
# any inconsistent behavior. However, the unittests need to run fast.
# Here, we use a factor 3 between the read period and the sleep calls.
#
# Look at devicetest examples for more advanced testing

# Device test case
class PyHLDeviceTestCase(DeviceTestCase):
    """Test case for packet generation."""
    device = PyHL
    properties = {'Test22': '1',
                  'Test': 'Test'}
    empty = None # Should be []

    @classmethod
    def mocking(cls):
        """Mock external libraries."""
        # Example : Mock numpy
        cls.numpy = PyHL.numpy = MagicMock()
        # PROTECTED REGION ID(PyHL.mocking) ENABLED START #
        # PROTECTED REGION END #-----// PyHL.mocking

    def test_properties(self):
        """test the properties"""
        # PROTECTED REGION ID(PyHL.test_properties) ENABLED START #
        # PROTECTED REGION END #-----// PyHL.test_properties
        pass

    def test_State(self):
        """Test for State"""
        # PROTECTED REGION ID(PyHL.test_State) ENABLED START #
        self.device.State()
        # PROTECTED REGION END #-----// PyHL.test_State

    def test_Status(self):
        """Test for Status"""

```

```

    def test_Status(self):
        """Test for Status"""
        # PROTECTED REGION ID(PyHL.test_Status) ENABLED START #
        self.device.Status()
        # PROTECTED REGION END #-----// PyHL.test_Status

    def test_CmdTest(self):
        """Test for CmdTest"""
        # PROTECTED REGION ID(PyHL.test_CmdTest) ENABLED START #
        self.device.CmdTest()
        # PROTECTED REGION END #-----// PyHL.test_CmdTest

    def test_CmdArg(self):
        """Test for CmdArg"""
        # PROTECTED REGION ID(PyHL.test_CmdArg) ENABLED START #
        self.device.CmdArg("")
        # PROTECTED REGION END #-----// PyHL.test_CmdArg

    def test_scalar_double_ro(self):
        """Test for scalar_double_ro"""
        # PROTECTED REGION ID(PyHL.test_scalar_double_ro) ENABLED START #
        self.device.scalar_double_ro
        # PROTECTED REGION END #-----// PyHL.test_scalar_double_ro

    def test_scalar_double_rw(self):
        """Test for scalar_double_rw"""
        # PROTECTED REGION ID(PyHL.test_scalar_double_rw) ENABLED START #
        self.device.scalar_double_rw
        # PROTECTED REGION END #-----// PyHL.test_scalar_double_rw

    def test_scalar_string_ro(self):
        """Test for scalar_string_ro"""
        # PROTECTED REGION ID(PyHL.test_scalar_string_ro) ENABLED START #
        self.device.scalar_string_ro
        # PROTECTED REGION END #-----// PyHL.test_scalar_string_ro

    def test_devencoded_ro(self):
        """Test for devencoded_ro"""
        # PROTECTED REGION ID(PyHL.test_devencoded_ro) ENABLED START #
        self.device.devencoded_ro
        # PROTECTED REGION END #-----// PyHL.test_devencoded_ro

    def test_image_short_ro(self):
        """Test for image_short_ro"""
        # PROTECTED REGION ID(PyHL.test_image_short_ro) ENABLED START #
        self.device.image_short_ro
        # PROTECTED REGION END #-----// PyHL.test_image_short_ro

# Main execution
if __name__ == "__main__":
    main()

```

## ▣ Pogo 9 - Python

### ■ Easy deployment

- python setup.py build install

### ■ Easy testing

- No need to rewrite your test code (if you use the protected regions of course)

### ■ Easy sharing

- Download the package
- Adapt the test script to your equipment
- Run it to see if everything is OK

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Questions ?