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# cPython support for NI VeriStand


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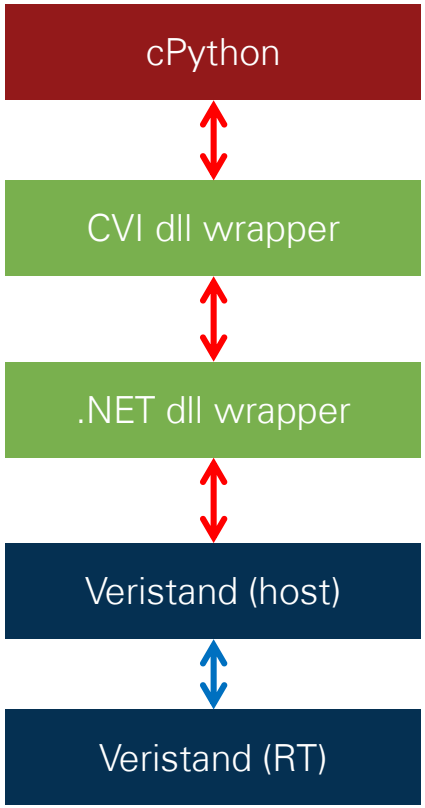
# Introduction

- For NI VeriStand automation from cPython the problem of managed/unmanaged code has to be solved, because NI VS API is written in C#
- The .NET dll wrapper was added to save effort in ANSI C and to have possibility to easily write unit test.
- Unit tests were done for all functions on .NET and also on C level.

# System architecture

Communication

API




Software stack

STD SW

REF DES

CUS SW

Hardware platform

STD HW

CUS HW

3RD HW

Testing segment

3RD DUT

# List of supported functions

- int **LaunchVeriStand**(void);
- int **OpenProject**(char *pszFileName);
- int **CloseVeriStand**(void);
- int **RunProject**(void);
- int **CloseProject**(void);
- int **ShowProjectWindow**(void);
- int **GetChannelValue**(char *pszChannelName, double *pdValue);
- int **SetChannelValue**(char *pszChannelName, double dValue);
- int **SetChannelValueSynch**(char *pszChannelName, double dValue, double *pWriteTime);
- int **OpenWorkspace**(void);
- int **CloseWorkspace**(void);
- int **DeployProject**(void);
- int **UndeployProject**(void);
- int **StopDataLogging**(char *logConfigName);
- int **SetMultipleChannelValues**(char **channelNames, double dValues[], int iLength, int iCharLineLength);
- int **SetMultipleChannelValuesSynch**(char **channelNames, double dValues[], int iLength, int iCharLineLength, double *pWriteTime);
- int **GetMultipleChannelValues**(char **channelNames, double dValues[], int iLength, int iCharLineLength);
- int **GetActiveProject**(char *ActiveProject,int RequestedProjectIndex, int *numberOfProjects);
- int **GetAllDeployedSessions**(char *DeployedSession,int RequestedSessionIndex, int *numberOfSessions);
- int **StartDataLogging**(char *logConfigName, char *logDescription,char *logFilePath,double lTriggerHighLimit, double lTriggerLowLimit,int lReplaceFile, NationalInstruments_VeriStand_ClientAPI_LogInfo_trigger lTriggerType, char *lTriggerChannel, double lRate,char ** lFilePropertiesNames,int lFilePropertiesNamesLength, int lFilePropertiesNamesLineLength, char ** lFilePropertiesValues,int FilePropertiesValuesLength, int lFilePropertiesValuesLineLength, char ** lChannelsToLog,int ChannelsToLogLength, int lChannelsToLogLineLength);
- char* **GetLastErrorMessage** (void);
- int **IsOpenProjectRunning**(int *running);

# List of supported functions

- int **GetAvailableChannelsToReadCount**(int *numberOfChannels);
- int **GetTargetRate**(double *TargetRate);
- int **GetAvailableChannelsToWriteCount**(int *numberOfChannels);
- int **GetAvailableChannelToRead**(char *channel,int requestedChannelIndex);
- int **GetAvailableChannelToWrite**(char *channel,int requestedChannelIndex);
- int **GetDataLogging2SessionState**(char *sLogConfigName,char *sSessionState);
- int **GetDataLogging2State**(char *sLogConfigName,int *sessionState);

- int **StimulusExecuteAsynch**(char *filePath, char *UUTSerialNumber);
- int **GetStimulusState**(int *stimulusState);
- int **RTSequenceExecuteAsynch**(char *filePath, char ** lParamNames,int lParamNamesLength, int lParamNamesLineLength,
- char ** lParamValues,int lParamValuesLength, int lParamValuesLineLength,
- char ** lParamTypes,int lParamTypesLength, int lParamTypesLineLength);
- int **GetRTSequenceState**(int *RTSequenceState);
- int **RTSequenceUndeploy**(void);

- int **GetTDMSLoggingRate**(double *loggingRate);
- int **GetTDMSLogChannelCount**(int *logChannelCount);
- int **GetTDMSLogLength**(__int64 *logLength);
- int **GetTDMSLogChannelProperty**(int channelIndex, char *propertyName, char *propertyValue);
- int **TDMSOpen**(char *filePath);
- int **TDMSClose**(void);
- int **TDMSReadColumn**(double logColumnData[],int iColumnLength,int channelIndex);
- int **TDMSReadTimeColumn**(double logColumnData[],int iColumnLength);

# cPython example

TestScript - CVI dll - test functions 1.6.py - C:\EXAM\DllCVI\TestScript - CVI dll - test funct...

File Edit Format Run Options Windows Help

```
from ctypes import *
import datetime
import traceback
import sys
import os

from time import sleep

#http://joule.ni.com/nidu/cds/view/p/id/3032/lang/cs
#http://www.microsoft.com/en-us/download/details.aspx?id=17718

def errorCheck(stat):
    """Check the error status and print if error"""
    if stat != 0:
        print stat
        print c_char_p(veristandInterOp.GetLastErrorMessage())
        quit()

print "TestScript - CVI dll - test functions 1.6.py"
veristandInterOp = cdll.LoadLibrary(".\VeriStandCviDll.dll")
print veristandInterOp

print "LaunchVeriStand"
errorCheck(veristandInterOp.LaunchVeriStand())

print "OpenProject"
errorCheck(veristandInterOp.OpenProject("C:\\EXAM\\VS\\Sinewave UnitTest.nivspro

print "ShowProjectWindow"
errorCheck(veristandInterOp.ShowProjectWindow())

print "DeployProject"
errorCheck(veristandInterOp.DeployProject())

print "OpenWorkspace"
errorCheck(veristandInterOp.OpenWorkspace())
sleep(2)

print "CloseWorkspace"
errorCheck(veristandInterOp.CloseWorkspace())
sleep(2)

print "OpenWorkspace"
errorCheck(veristandInterOp.OpenWorkspace())
```



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# DEMO

# Questions & Answers

- Thank you