Extending and Embedding Python under Windows using Visual C/C++

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The UseCase

- Dynamically typed Interpreted language
- Statically typed Compiled languages
- Write the performance critical part in C/C++
- Writing Bindings for C/C++ libraries for seamless integration with Python
- Embedding Python Interpreter inside a Native application to enable people to write glue code using Python.

Agenda

- Windows DLL – A Quick Primer
- Python 2.x vs 3.x
- Hello World extension
- Some non trivial extensions
- Creating Types using C/C++
- Embedding Python Interpreter
- Embedding Python to execute a module using C/C++
- Q&A

Windows DLL – A Quick Primer

- Dynamic Link Library
- Writing a simple DLL using Visual C/C++ command line compiler
- Exporting a function
- Import Library and DEF files
- Calling convention details
- All C/C++ extensions are packaged as DLLs

Python 2.x vs 3.x

- There is subtle difference at the language level
- There is difference in C API calls
- Most of the code base is still 2.x
- With a bit of preprocessor magic , we can write extensions compatible with 2.x and 3.x (at the source level)

Hello World extension

- Write the Code which returns "Hello World"
- Populate the method table
- Populate the module information
- Write the initialization function
- Compilation , Linking and renaming of the DLL
- Loading from the Python Environment
- Execute the method

Some non trivial extensions

- Square extension – Computes the square
- Quadratic Evaluation extension
- Sum a tuple
- Sum a list

Creating Types using C/C++

- Defining a new type
- Adding properties
- Adding methods
- Consuming the type inside a Python script

Embedding Python Interpreter

- Initialize the Python run time
- Execute the Python script
- Clean up

Embedding Python to execute a module using C/C++

- Parsing the Command line argument
- Converting the arguments to Python string
- Python string changes between 2.x and 3.x
- Reference counting

Q&A

Any Questions ?
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