

Interoperating with Dynamic Languages

LEVERAGING FEATURES OF OTHER LANGUAGES



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Overview



Why dynamic interop?

Getting started with IronPython

Getting scripting input from the user

Executing Python statements

Interacting with Python objects

Passing custom dynamic objects to Python



Why Dynamic Interop?

Language
Features

Libraries and
Scripts

Scripting

Not existing in C#
Chained comparison operators
 $1 < \text{age} < 50$
More elegantly solve the problem

Existing libraries
Scripts
No .NET version exists
Already written in company

Add user scripting to application
E.g. user entering business rules as expressions



Demo



Getting Started with IronPython

IronPython NuGet package

Execute simple expression in Python

```
ScriptEngine engine = Python.CreateEngine();
```

```
Execute(simpleExpression)
```

Result as dynamic

Typed result



Demo



Getting Scripting
Input from the
User

Evaluate customer age with Python expression

Expression entered at runtime by user

ScriptScope

```
SetVariable("a", customerAge);
```

SourceCodeKind.Expression



Allowing users to enter and execute arbitrary script/code may introduce security, data corruption, and other risks.



Demo



Executing Python Statements

Execute Python statement and get result

Statement entered at runtime by user

```
ScriptScope scope = engine.CreateScope();
```

```
SourceCodeKind.SingleStatement
```

```
scope.GetVariable("result");
```



Demo



Interacting with
Python Objects

Create Python tuple object

```
“customer = ('Sarah', 42 , 200)”
```

```
SourceCodeKind.SingleStatement
```

```
scope.GetVariable(“customer”)
```

Access tuple properties

```
pythonTuple[0]
```



Demo



Passing Custom
Dynamic Objects
to Python

```
new HTMLElement("img")
```

```
scope.SetVariable("image", image);
```

```
Create SetImageAttributes.py
```

```
image.src = "car.png";
```

```
image.alt = "a blue car";
```

```
Set "Copy to output directory"
```

```
CreateScriptSourceFromFile("SetImageAttributes.py")
```

```
source.Execute(scope);
```

Attributes added in Python code available in C#



Summary



Why dynamic interop?

Getting started with IronPython

IronPython NuGet package

`Python.CreateEngine()`

`SourceCodeKind.Expression`

`SourceCodeKind.SingleStatement`

Python tuple

`engine.CreateScriptSourceFromFile()`

Pass `HtmlElement` to Python script

