

April 10, 2010



PHILLY.NET CODE CAMP 2010.1

Dynamic Languages

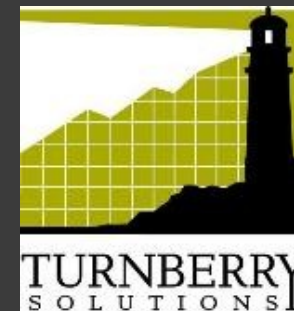
Extending .NET Applications

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Agenda

- ⦿ Dynamic vs. Static Languages
- ⦿ Use Cases for Script Hosting
- ⦿ Dynamic Language Runtime (DLR)
- ⦿ DLR Hosting API
- ⦿ Tips and Techniques
- ⦿ Samples: IronPython, IronRuby and Boo
- ⦿ Questions

Static vs. Dynamic Languages

- ◉ Static Languages
- ◉ Type safety
- ◉ Compile-time checking
- ◉ Runtime performance
- ◉ Syntactic Sugar

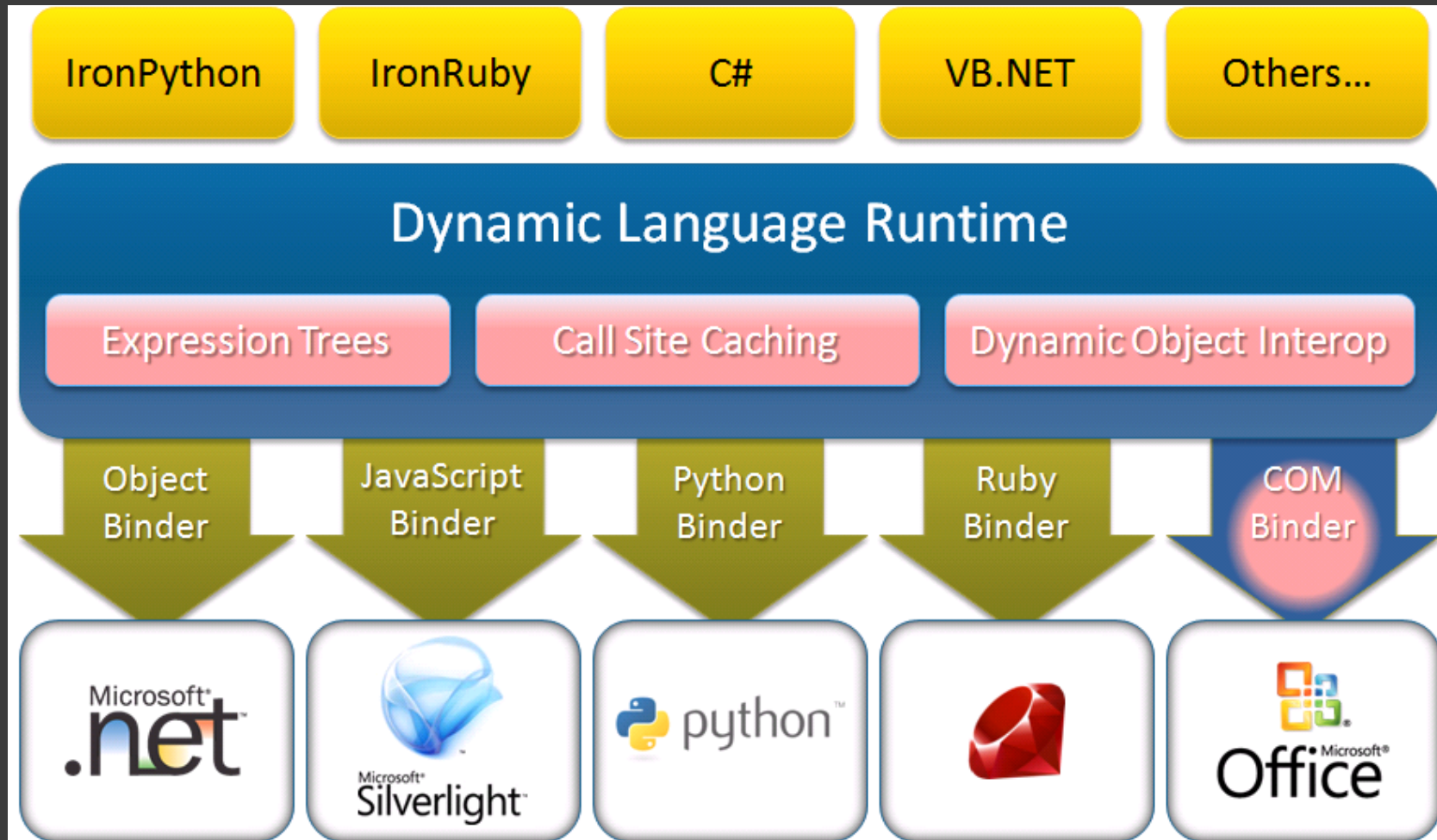
- ◉ Dynamic Languages
- ◉ Late bound
- ◉ Loosely typed
- ◉ Highly expressive

Script Hosting Use Cases

- ⦿ Why would you want to host a scripting language in your application?
- ⦿ Provide extensibility (the obvious answer)
- ⦿ Replace complicated XML configuration (e.g. NAnt, EntLib, etc.) with meaningful code
- ⦿ Remove clutter from core application logic (validation, sanity checks, etc.)
- ⦿ Maintain transient logic outside of core application code (rules processing)

Dynamic Language Runtime

(From CodePlex)

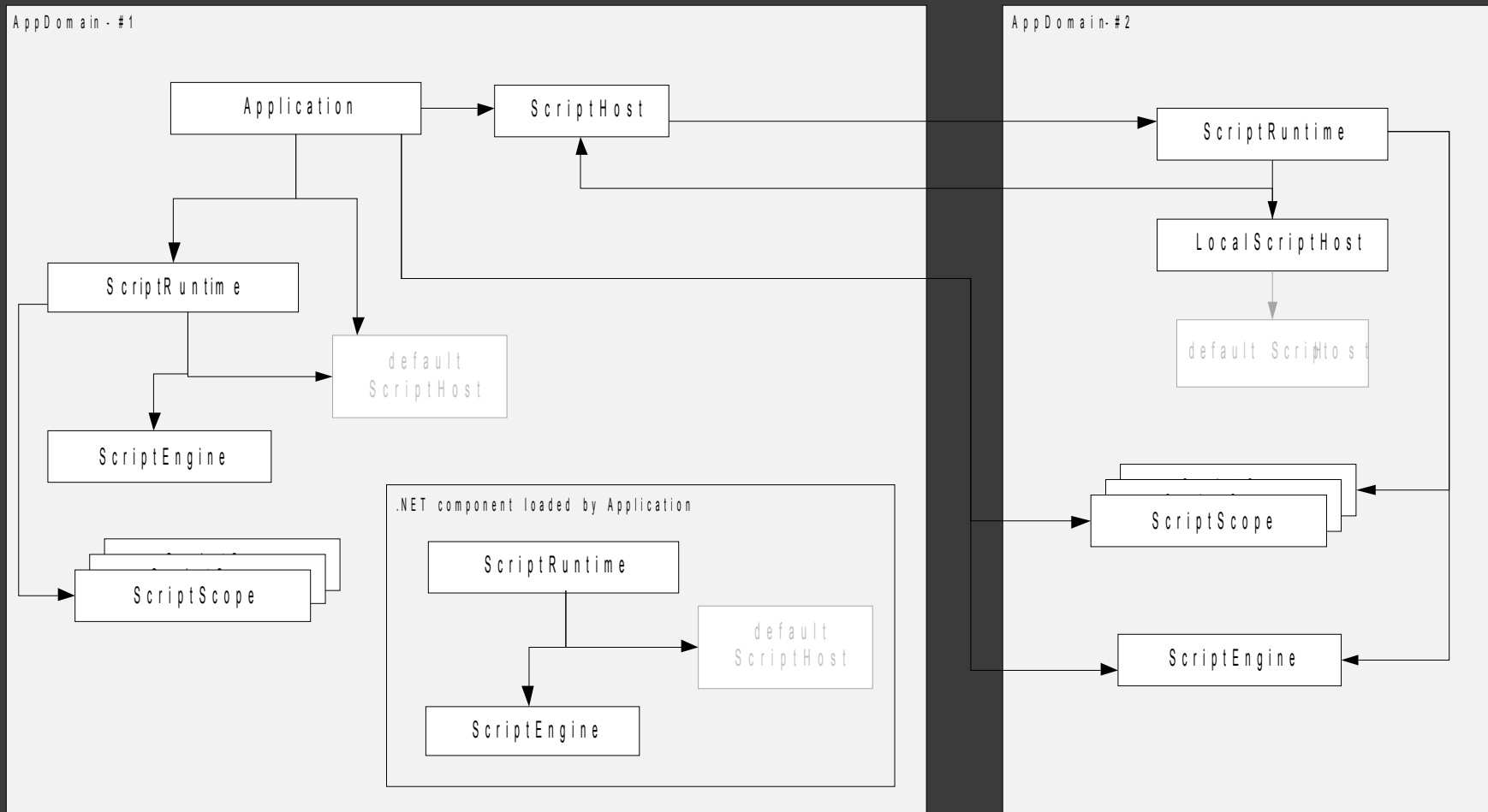


Dynamic Language Runtime

- ⦿ Language implementation services
- ⦿ Language interoperability
- ⦿ Shared dynamic type system
- ⦿ Runtime services
- ⦿ Fast dynamic code generation through various caching mechanisms
- ⦿ Utilities to allow statically typed objects to share in the dynamic message passing protocol

Hosting API

(from CodePlex)



Hosting API

- ⦿ ScriptRuntime
- ⦿ Starting point for hosting
- ⦿ Represents global script state (referenced assemblies, available engines, etc.)
- ⦿ Bound scopes (named globals)
- ⦿ Constructed with ScriptRuntimeSetup, which uses configuration settings

Hosting API

- ⦿ ScriptEngine
- ⦿ Represents a DLR language implementation (PythonEngine, RubyEngine)
- ⦿ One engine, per-language, per-runtime
- ⦿ Methods to execute code and create ScriptScope instances

Hosting API

- ⦿ ScriptScope
- ⦿ Essentially represents a namespace
- ⦿ Unit of isolation within a runtime
- ⦿ Has language affinity
- ⦿ Variables may be set and retrieved at scope
- ⦿ ScriptRuntime.Globals is actually an instance of a ScriptScope

Hosting API

- ④ ScriptSource
- ④ Represents source code
- ④ Provides means for code execution and compilation
- ④ Created from ScriptEngine or ScriptScope instances

Hosting Tips and Techniques

- The script is an extension of the application, not core application logic
- Treat the script as if it were a plugin or provider implementing an interface.
- Create a simple object graph to act as the controller between the script and model
- Provide the script with function references to work indirectly with model objects



The IronPython Language

- ⦿ CLI implementation of the Python language
- ⦿ Hosted on CodePlex
- ⦿ Integration with many common Python libraries
- ⦿ Built on top of the DLR
- ⦿ Sample: Hosted IronPython

The IronRuby Language

- ⦿ CLI implementation of the Ruby language
- ⦿ Hosted on RubyForge
- ⦿ Built on top of the DLR
- ⦿ Sample: Hosted IronRuby

The Boo Language

- ⦿ Object oriented, statically typed language written for the CLI
- ⦿ Has a Python-like feel (whitespace, blocks)
- ⦿ Supports Duck typing (dynamic-like behavior)
- ⦿ Flexible syntax, extensible compiler and InteractiveInterpreter make it strong choice for DSL implementations
- ⦿ Sample: Hosted Boo

Resources

- ⦿ <http://www.codevoyeur.com> – DLR + Boo Samples, other OSS samples, presentations and articles
- ⦿ <http://www.dllhell.net> – My blog
- ⦿ <http://www.codeplex.com/dlr>
- ⦿ <http://www.codeplex.com/IronPython>
- ⦿ <http://boo.codehaus.org>
- ⦿ <http://www.ironruby.net>

Questions?

