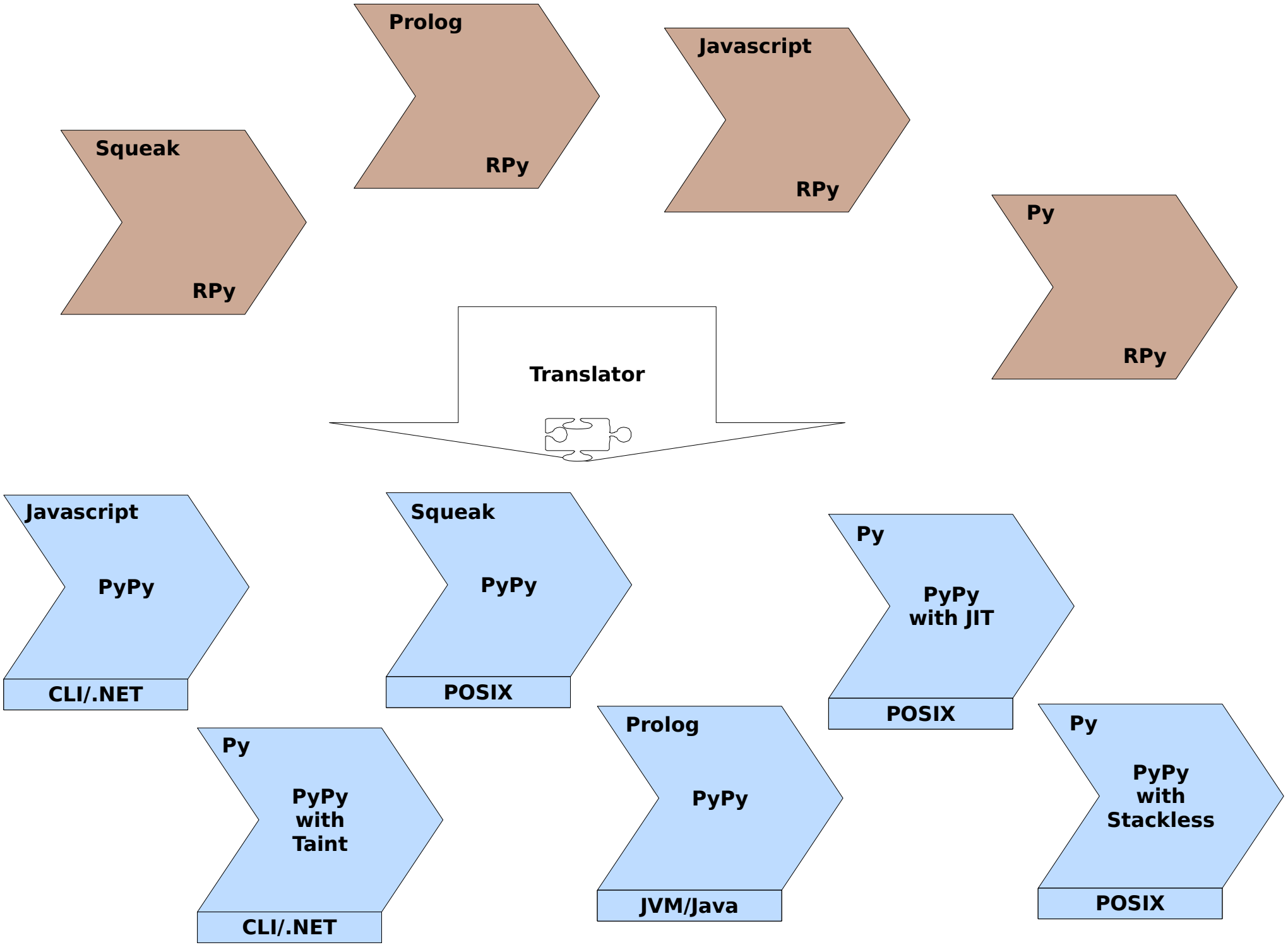
PyPy

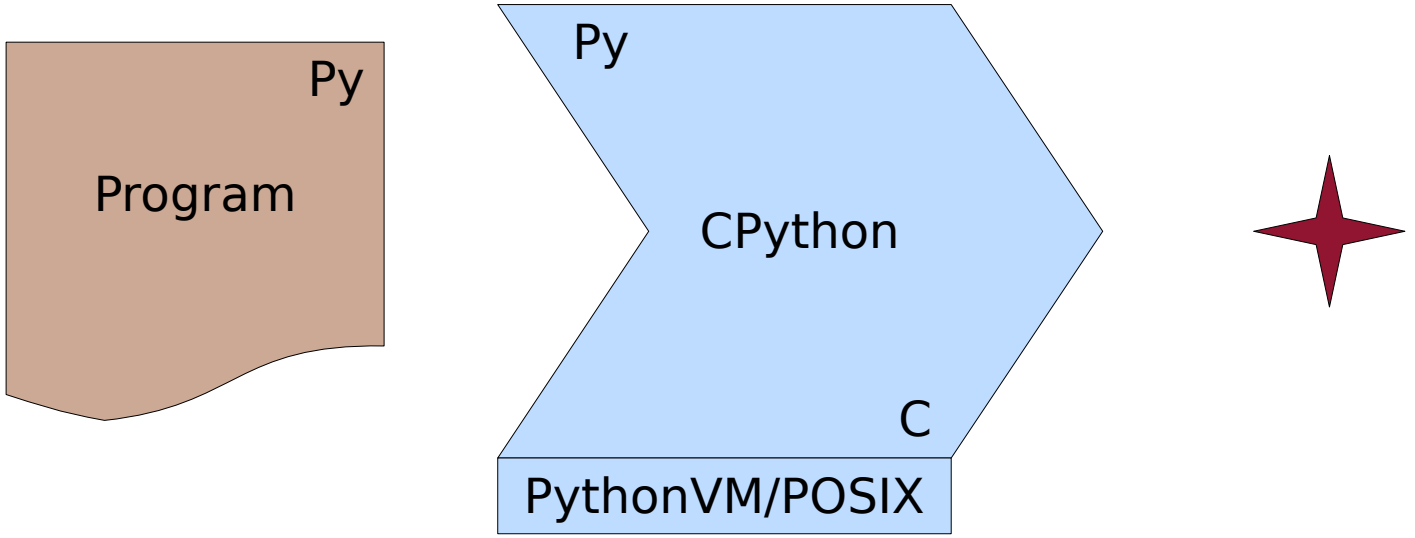
The Art of Generating Virtual Machines

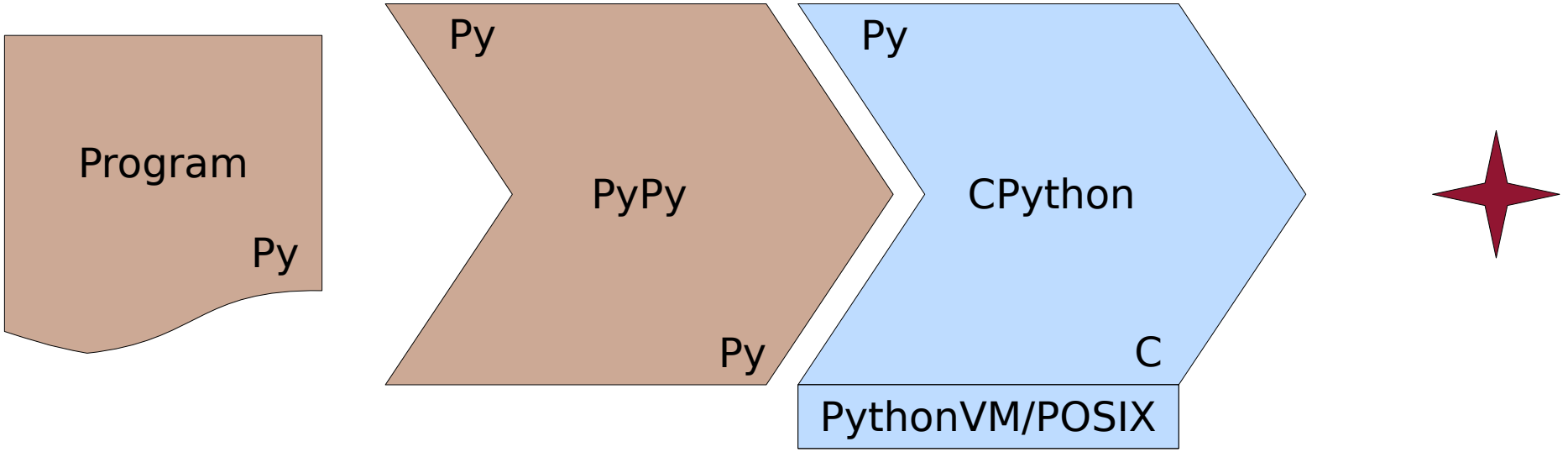
Samuele Pedroni Laura Creighton
Armin Rigo Jacob Hallén

http://www.codespeak.net/pypy


Prolog
RPy
Javascript
RPy
Squeak
RPy
Py
RPy
Translator
Javascript
PyPy
CLI/.NET
Squeak
PyPy
POSIX
Py
PyPy
with JIT
POSIX
Py
PyPy
with
Taint
CLI/.NET
Prolog
PyPy
JVM/Java
Py
PyPy
with
Stackless
POSIX

PyPy Architecture


Py
Program
Py
CPython
C
PythonVM/POSIX


Program
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CPython
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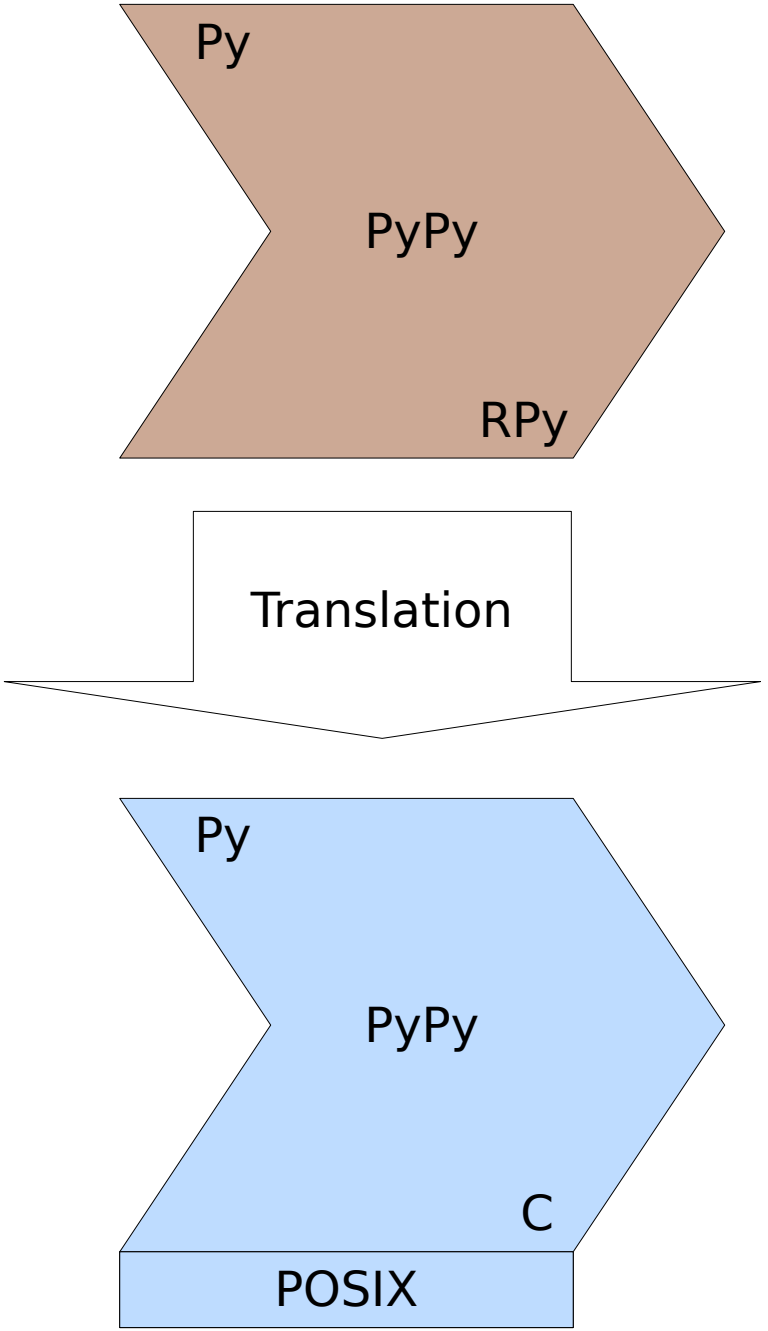
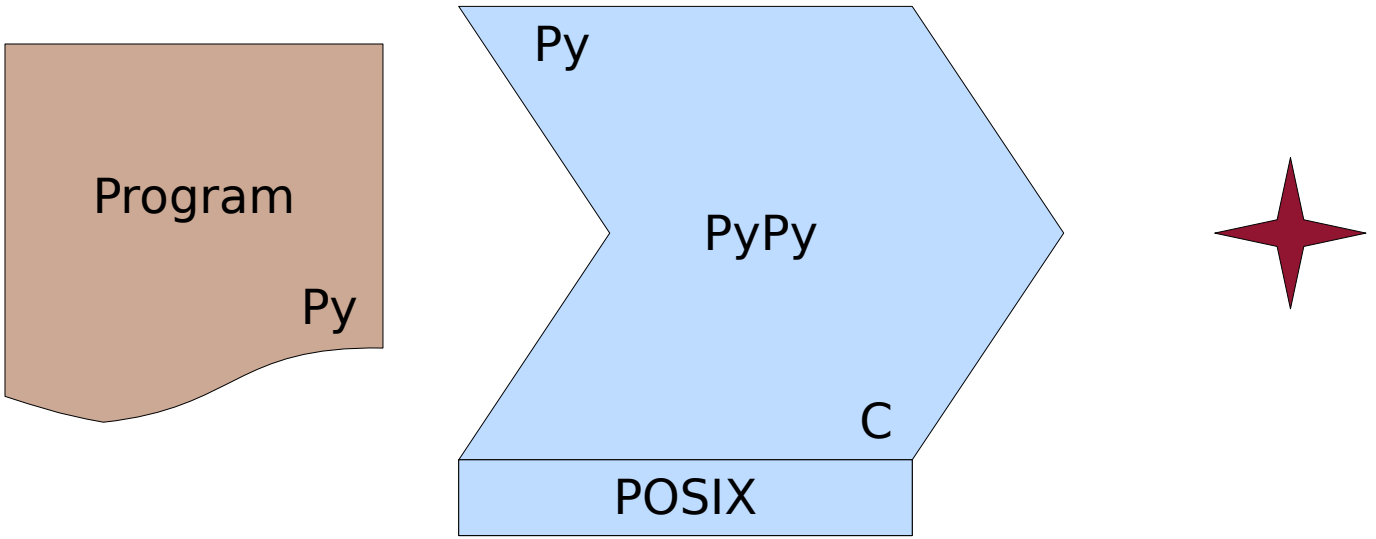
PythonVM/POSIX


Py
PyPy
RPy
Translation
Py
PyPy
C
POSIX


Program
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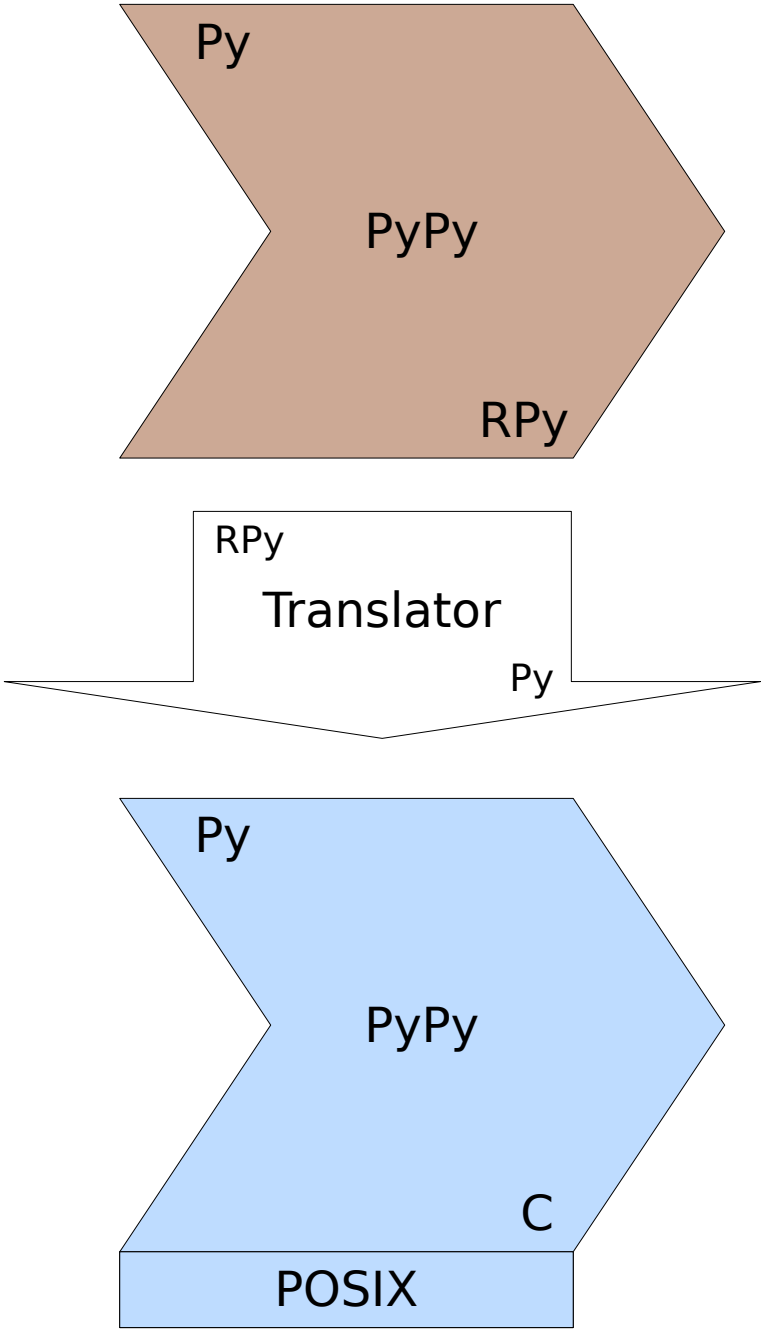
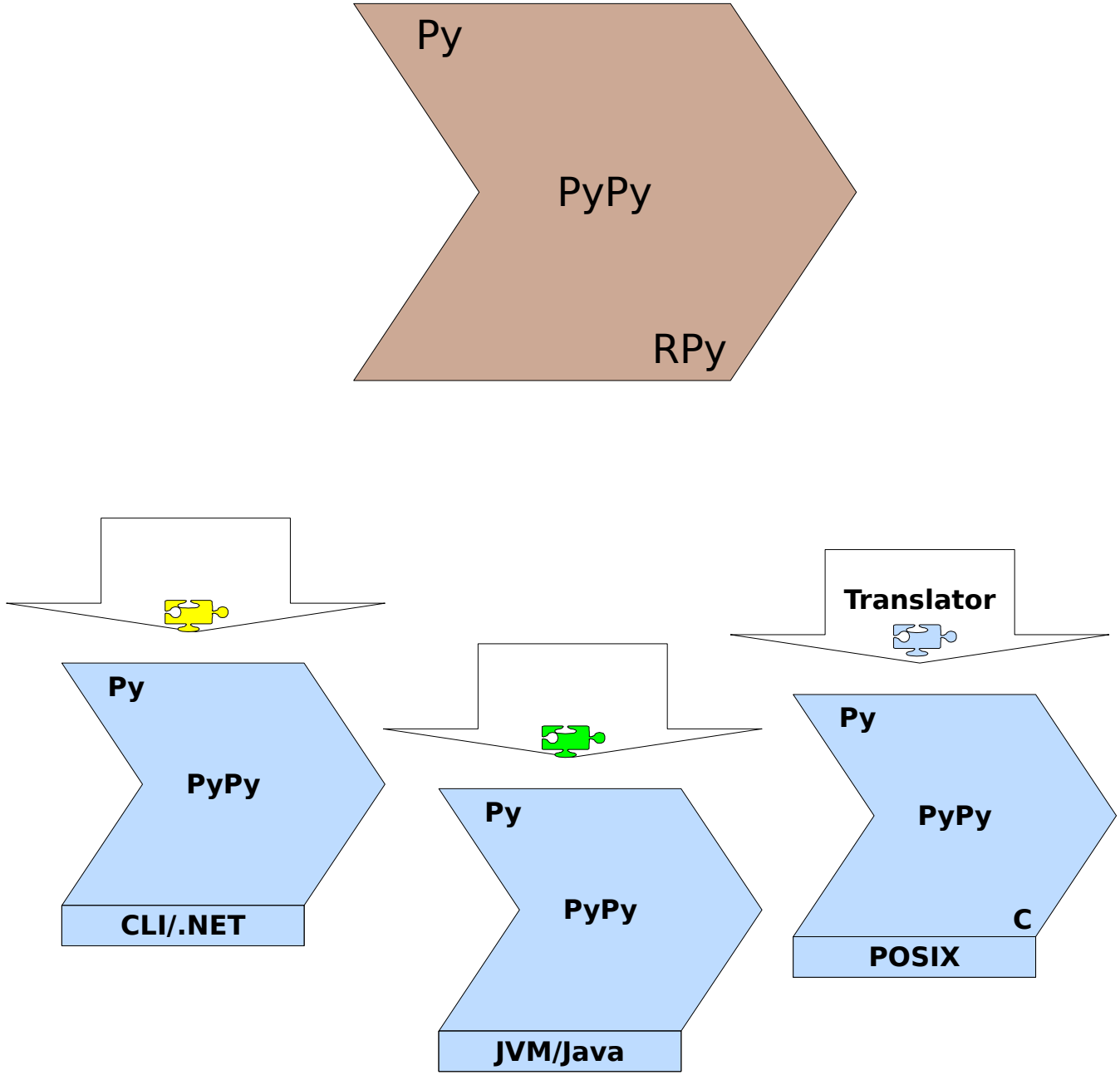
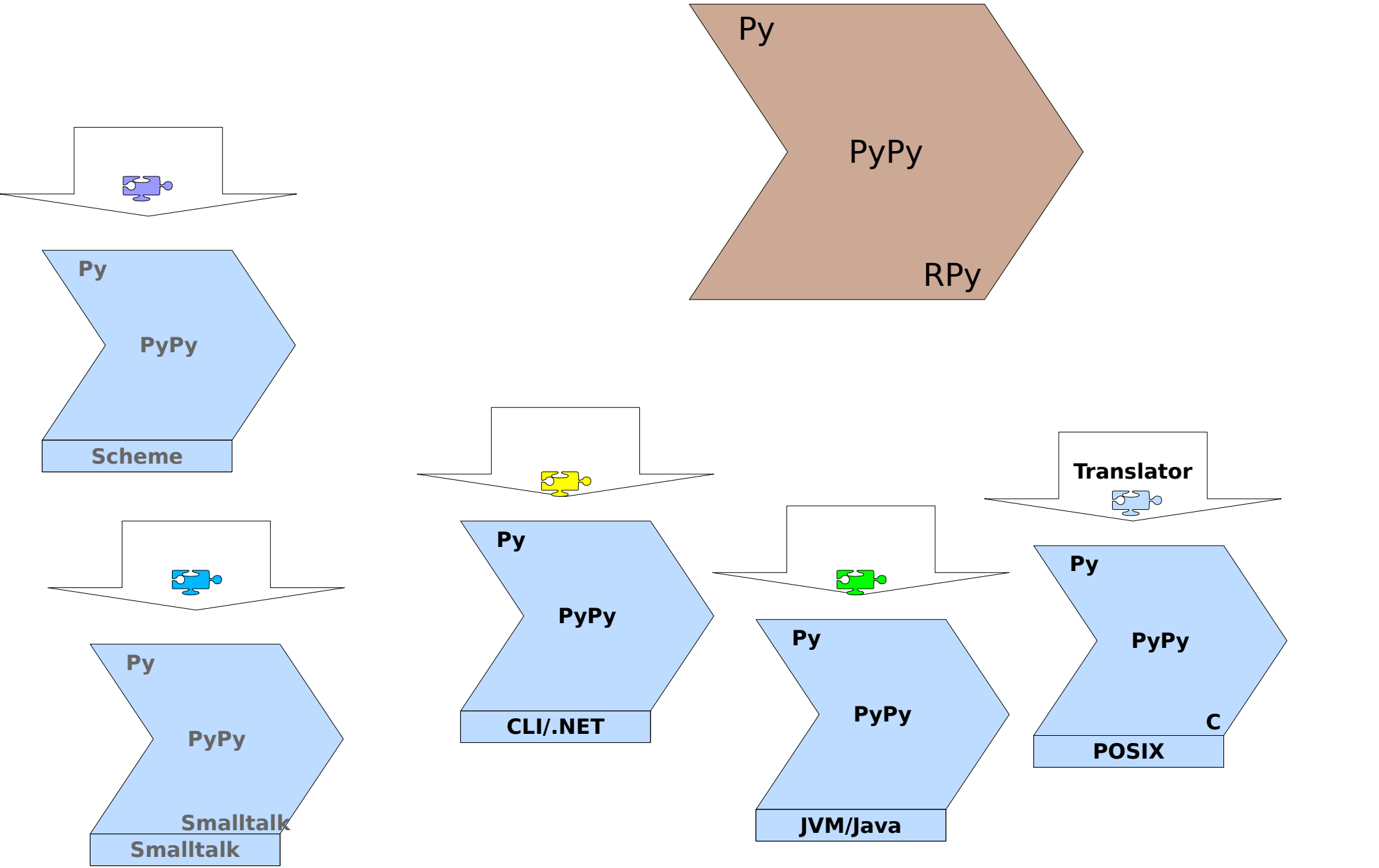
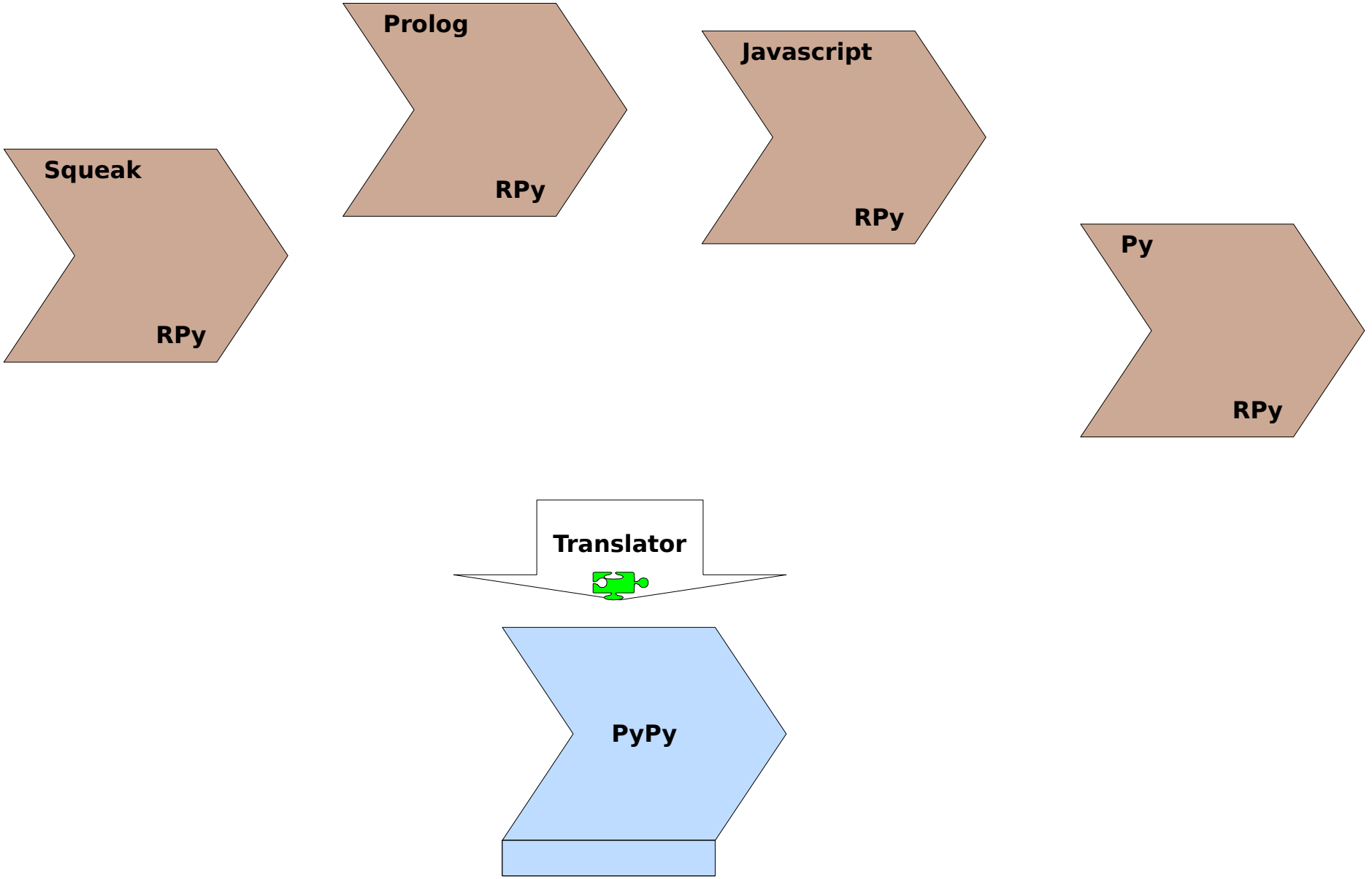
Py
PyPy
C
POSIX


Py
PyPy
RPy
RPy
Translator
Py
Py
PyPy
C
POSIX


Py
PyPy
RPy
Translator
Py
PyPy
CLI/.NET
Py
PyPy
JVM/Java
Py
PyPy
C
POSIX


Py
PyPy
RPy
Py
PyPy
Scheme
Py
PyPy
Smalltalk
Smalltalk
Py
PyPy
CLI/.NET
Py
PyPy
JVM/Java
Translator
Py
PyPy
C
POSIX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Squeak
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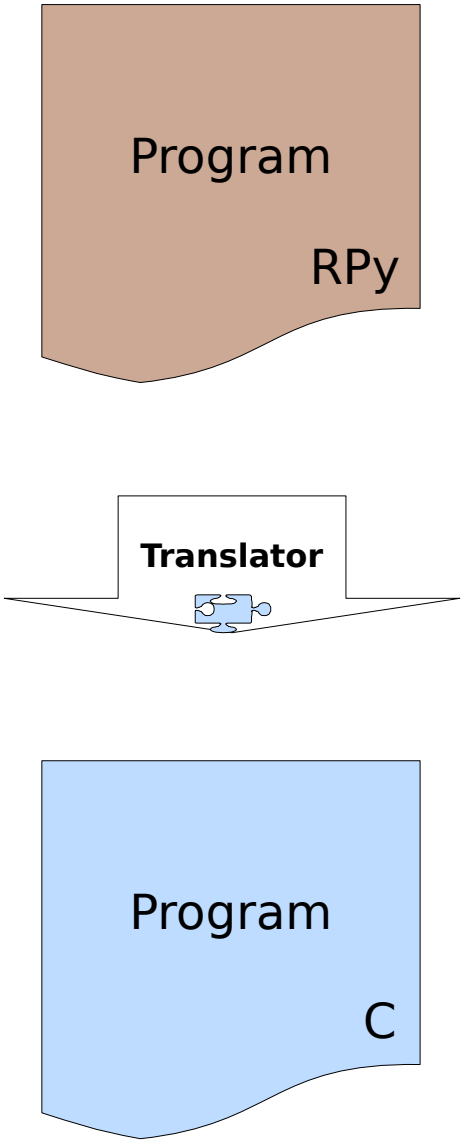
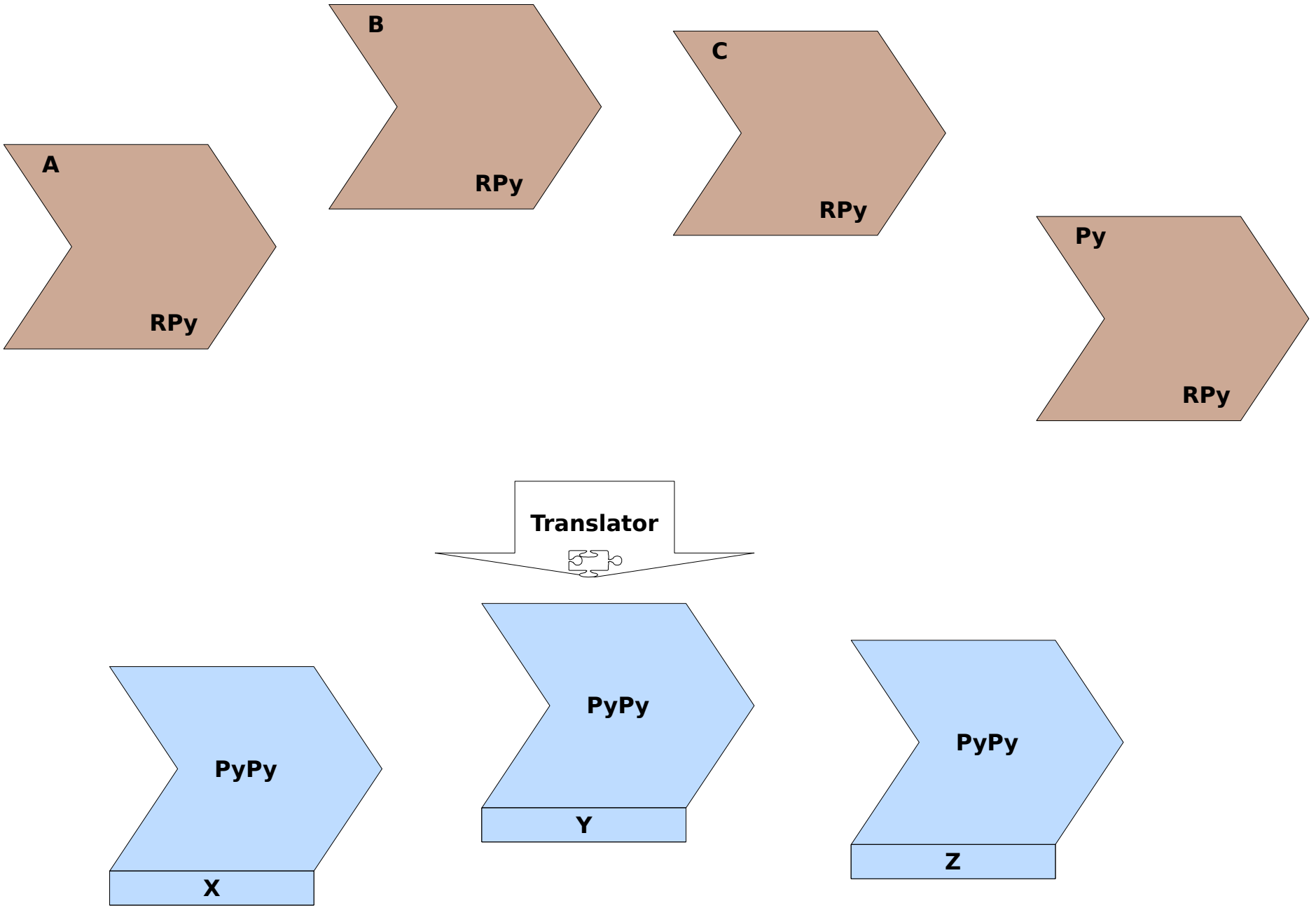
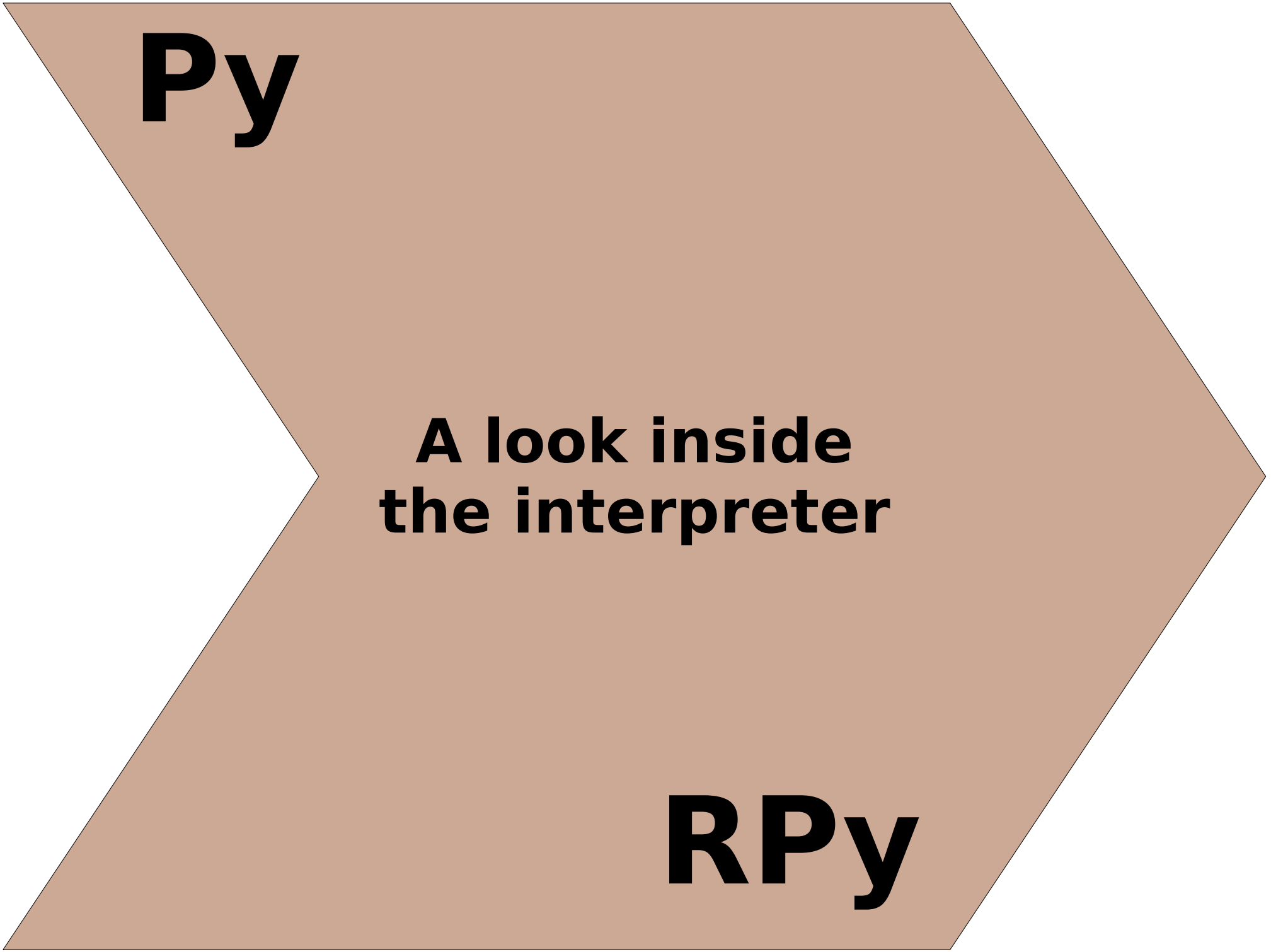
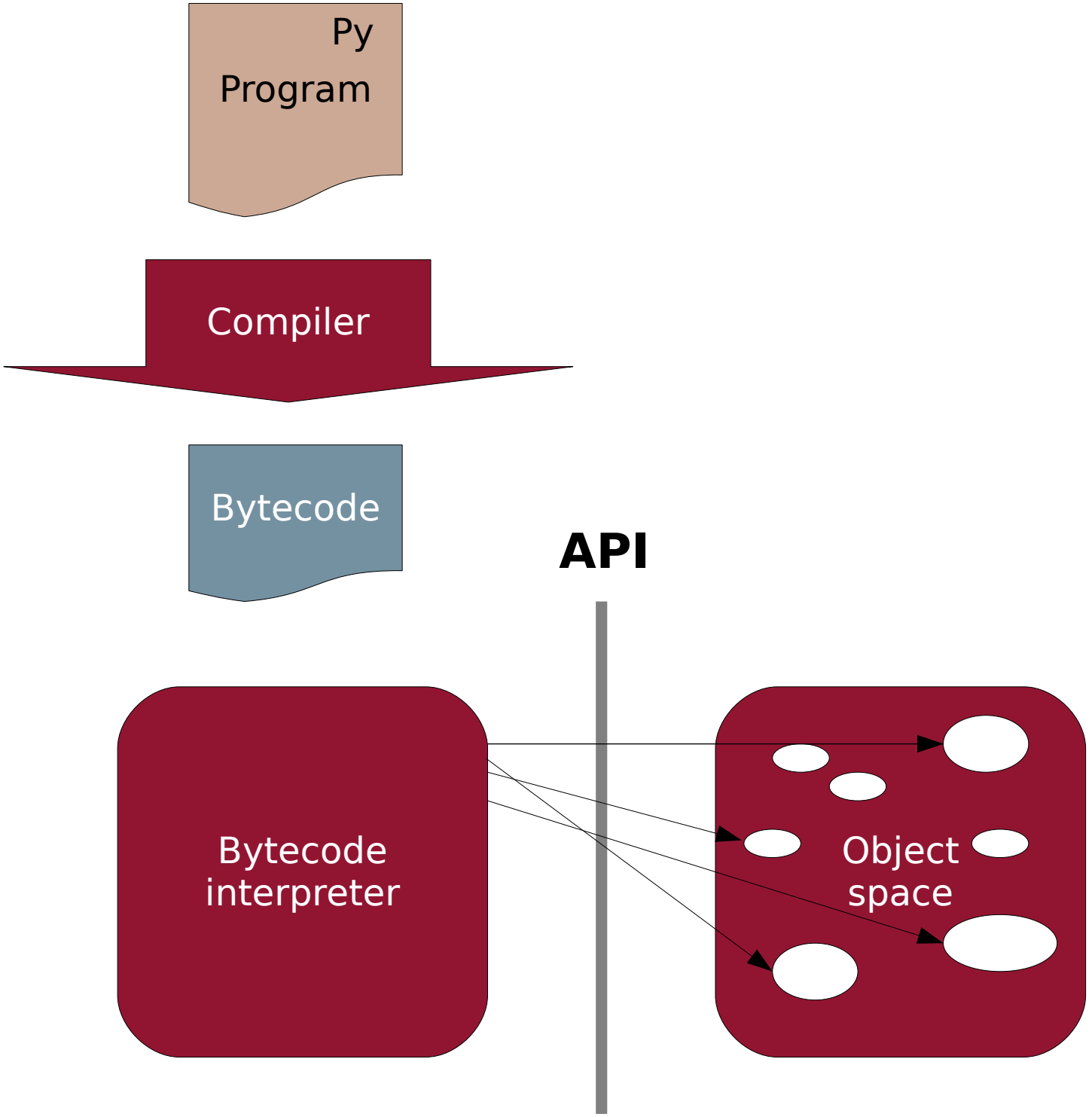
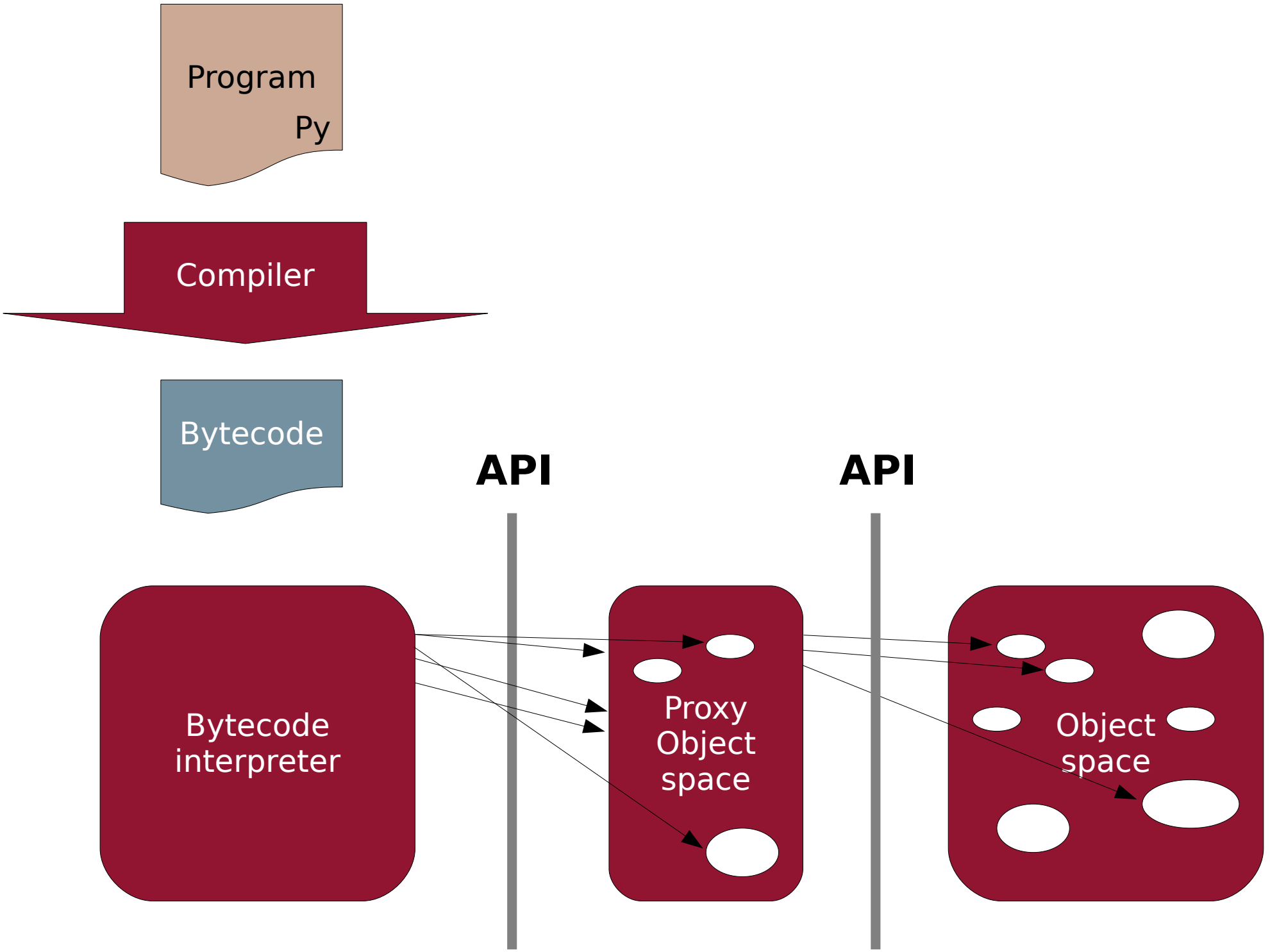
Translator
PyPy


Program
RPy
Translator
Program
C


A
RPy
B
RPy
C
RPy
Py
RPy
Translator
PyPy
X
PyPy
Y
PyPy
Z


Py
A look inside
the interpreter
RPy


Py
Program
Compiler
Bytecode
API
Bytecode
interpreter
Object
space


Program
Py
Compiler
Bytecode
API
API
Bytecode
interpreter
Proxy
Object
space
Object
space

Py

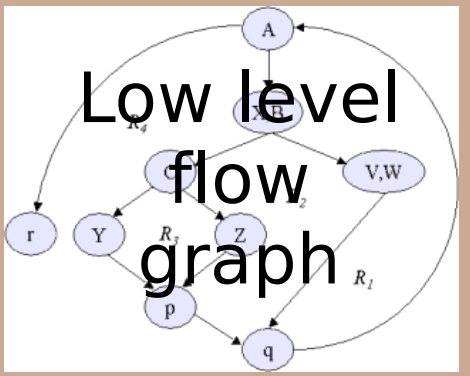
A look inside
the translator

RPy

Compiler

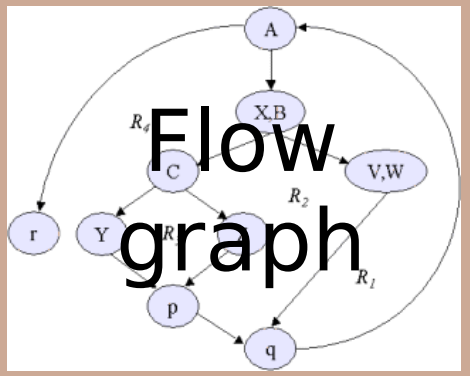
Bytecode interpreter

Flow object space

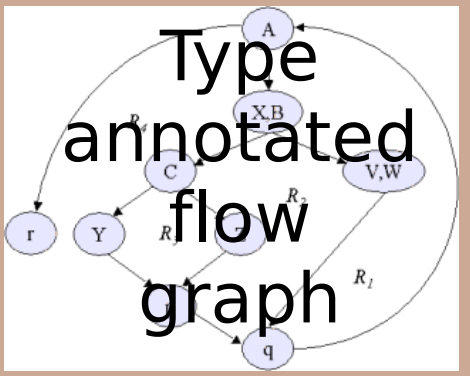


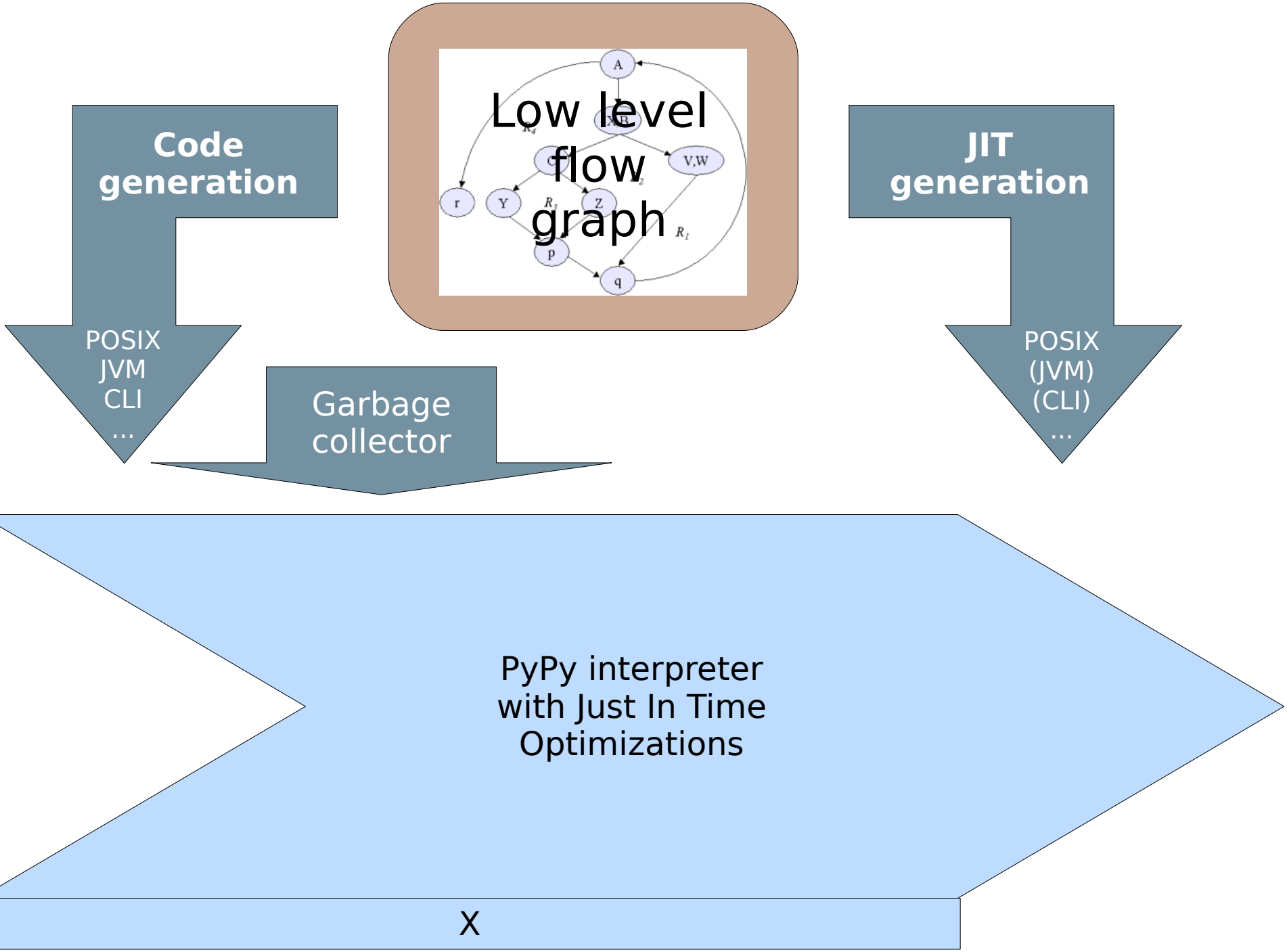
Flow analysis

RTyper



Anno-tation




Low level flow graph
A
V,W
r
Y
Z
p
q
Code generation
POSIX
JVM
CLI
...
Garbage collector
JIT generation
POSIX
(JVM)
(CLI)
...
PyPy interpreter with Just In Time Optimizations
X