

Jython

For fun and profit

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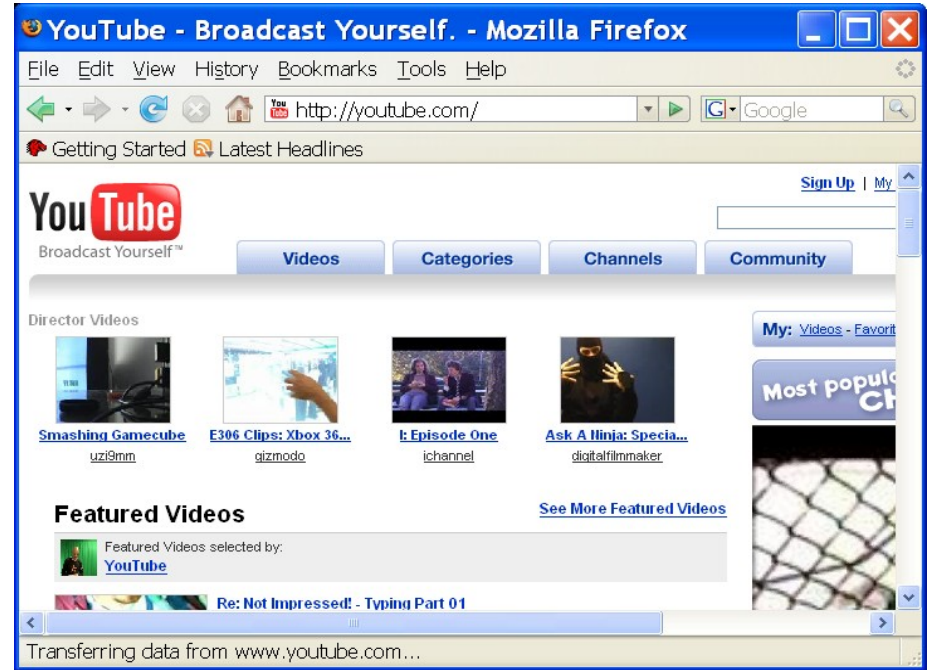
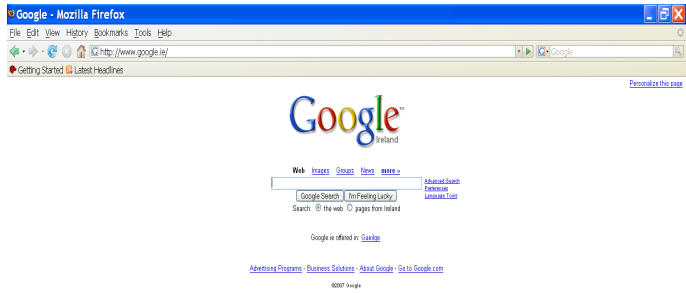
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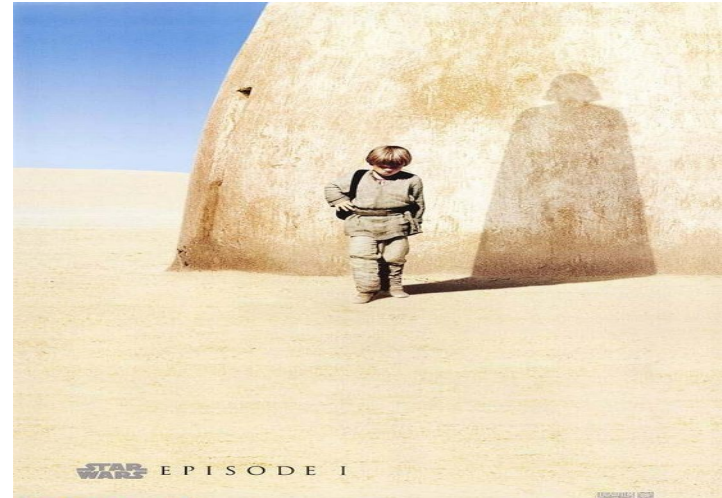
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First...Python...



First...Python...



Paint Shop™ Pro® 9
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A close-up photograph of two human eyes. The irises are replaced by a detailed image of the Earth from space, showing continents and oceans.

Initializing Materials Manager...

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The Who/What/Where/When and Why of Jython

- What
 - Python is written in C...
 - Rewrite in Java...Python on the JVM
 - The Java Virtual Machine is not the same thing as Java the Language
 - Can target JVM from many languages. Mix'n'match dynamic and static programming language techniques
- Who:
 - Jim Hugunin, CNRI, 1997, JPython
 - ...
 - Frank Wierzbicki - Red Hat - Current dev lead – now called Jython
-

Glue

- Big Slow moving Enterprise Apps meet
 - Changing business requirements
 - Constantly changing integration requirements
 - Insanely rapid churning of “front end” technologies...Web, Mobile, Second Life...
- ...Glue languages bolt everything together
 - Long history
 - .bat files...bash...rexx...awk...perl...visual basic...ruby...python...lisp...lua...

Examples

- Databases like Oracle, messaging systems like MQSeries, Document Management Systems like Documentum, App Servers like WebSphere...
- Common Denominator = JVM Connectivity
- BUT
 - Java is not a pleasant Glue Language

Enter Jython

- Jython for
 - “Java” GUI Development
 - XML Munging
 - Servlets
 - Java Unit Testing

Jython for GUI Dev

- Will work with any of the GUI toolkits (since they are just libraries at the end of the day)
- AWT – equally ugly everywhere
- SWING – equally buggy everywhere
- SWT – So much for the portable GUI library

Jython/SWT



Jython/SWT

```
"""
```

```
Simple SWT Example
```

```
Sean McGrath
```

```
"""
```

```
from org.eclipse.swt.events import *  
from org.eclipse.swt.graphics import *  
from org.eclipse.swt.layout import *  
from org.eclipse.swt.widgets import *  
from org.eclipse.swt.layout.GridData import *  
from org.eclipse.swt import *
```

Jython/SWT

```
class gui:  
  
    def messageBox (self,s):  
        mb = MessageBox (self.shell,SWT.OK)  
        mb.setMessage (s)  
        if mb.open() == SWT.OK:  
            print "OK"
```

Jython/SWT

```
def main(self):
    self.display = Display()
    self.shell = Shell (self.display,text="Sample SWT Jython App")
    # Two Column Grid Layout
    self.shell.setLayout (GridLayout(numColumns=2))

    self.menuBar = Menu (self.shell,SWT.BAR)

    self.fileMenuHeader = MenuItem (self.menuBar,SWT.CASCADE)
    self.fileMenuHeader.setText ("&File")

    self.fileMenu = Menu (self.shell,SWT.DROP_DOWN)
    self.fileMenuHeader.setMenu (self.fileMenu)

    self.fileExitItem = MenuItem (self.fileMenu,SWT.PUSH)
    self.fileExitItem.setText ("&Exit")
    self.fileExitItem.addSelectionListener (FileExitItemListener(self.shell,self.display))

    self.shell.setMenuBar (self.menuBar)
```

Jython/SWT

```
# row1
self.r1c1 = Label(self.shell, SWT.SINGLE,
                 text="Label 1:",
                 layoutData=GridData (HORIZONTAL_ALIGN_FILL, horizontalSpan=1))

self.r1c2 = Text(self.shell, SWT.SINGLE|SWT.BORDER,
                 layoutData=GridData (HORIZONTAL_ALIGN_FILL, horizontalSpan=1))
self.r1c2.setText("")
# row2
self.r2c1 = Label(self.shell, SWT.SINGLE,
                 text="Label 2:",
                 layoutData=GridData (HORIZONTAL_ALIGN_FILL, horizontalSpan=1))

self.r2c2 = Combo(self.shell, SWT.NONE,
                  items=("Apple", "Orange"),
                  layoutData=GridData (HORIZONTAL_ALIGN_FILL, horizontalSpan=1))
# row3
self.r3 = Button (
    self.shell,SWT.PUSH,text="Click Me",
    widgetSelected = self.button_handler,
    layoutData=GridData (HORIZONTAL_ALIGN_FILL, horizontalSpan=2))
```

Jython/SWT

```
# Boilerplate Event Loop Voodoo
```

```
self.shell.pack()  
self.shell.open()
```

```
while not self.shell.isDisposed():  
    if not self.display.readAndDispatch():  
        self.display.sleep()
```

```
self.display.dispose()
```

```
# Event Handlers by the boat load
```

```
def button_handler(self, evt):  
    self.messageBox ("Hello world")
```

Jython/SWT

```
# More boilerplate
```

```
class FileExitItemListener (SelectionListener):
```

```
    def __init__(self,shell,display):  
        self.shell = shell  
        self.display = display
```

```
    def widgetSelected(self,evt):  
        self.shell.close()  
        self.display.dispose()
```

```
    def widgetDefaultSelected(self,evt):  
        self.shell.close()  
        self.display.dispose()
```

```
if __name__ == "__main__":  
    app = gui()  
    app.main()
```

Jython for XML Munging

- Xerces/Xalan
- SAX API Example

Jython for XML Munging

```
"""
```

```
XML Processing Example using Xerces SAX
```

```
"""
```

```
from org.xml import sax as java_sax
from java.io import FileReader
```

```
class XMLHandler (java_sax.helpers.DefaultHandler):
```

```
    def startDocument (self):
        print "START DOCUMENT"
```

```
    def startElement(self, uri, name, qname, attrs):
        print "START ELEMENT %s" % name
```

```
fr = FileReader("test.xml")
input_source = java_sax.InputSource(fr)
xml_handler = XMLHandler()
xr = java_sax.helpers.XMLReaderFactory.createXMLReader()
xr.setContentHandler(xml_handler)
xr.parse(input_source)
fr.close()
```

Jython for XML Munging

test.xml

```
<test>  
<p>Hello world</p>  
</test>
```

```
$jython xml.py
```

```
START DOCUMENT  
START ELEMENT  
test  
START ELEMENT p
```

Jython for Servlets

```
from java.io import *
from javax.servlet.http import HttpServlet
from JythonServletUtils import *
import calendar,time

class JythonServlet (HttpServlet):
    def doGet(self,request,response):
        self.doPost (request,response)

    def doPost(self,request,response):
        toClient = response.getWriter()
        response.setContentType ("text/html")
        toClient.println ("<html><head><title>Jython Servlet Test</title>")
        toClient.println ("<body><h1>Calendar</h1><pre>%s</pre></body></html>" %
            calendar.calendar(time.localtime()[0]))
```

Jython for testing

- interactive shell a great boon for application testing
- junit/unittest
- pushtotest/grinder etc.
- Some big Java shops use Jython extensively for testings but don't talk about it in public

The Wider Python World

- CPython also begat...
 - IronPython
 - PyPy
- OLPC, OpenOffice, Chandler, Plone, TurboGears, Django

Jython – the bad news

- Implementation progress keeping in synch with Cpython is slow. No “Big Co” very involved
- Sometimes the join is not completely seamless – java arrays, wrapper classes can get in the way e.g. logging
- Jython lags – and probably alway will lag - CPython

Jython – the good news

- Incredible productivity compared to pure Java Programming Language app dev
- Even if you only use Jython for test, use it! You will be amazed at the difference it makes to productivity

The Dynamic Languages Revolt

- “scripting languages” grrrrr....
- Static languages
 - Prevent certain types of failure by preventing certain types of success
- *“A program is correct if it gets the job done before your boss fires you”* -- Larry Wall
- “Ship the prototype” -- MPRTDV
- Dynamic Languages/Agile Dev/XP
- *“Behind DNS, nobody hears you redeploying your gradually improving app, every day”*
- The Ruby on Rails Effect

Resources

- <http://www.jython.org>
- Frank's blog: <http://fwierzbicki.blogspot.com/>
- Jython Essentials; Pedroni, Rappin (ISBN: 0596002475)
- Barry Feigenbaum:
 - <http://www-128.ibm.com/developerworks/java/library/j-alj07064/>
 - Excellent two part Jython (and Python) tutorial:
<http://www.jython.org/j-jython1-ltr.pdf>
<http://www.jython.org/j-jython2-ltr.pdf>
- Jython Servlet Tutorial (part 1):
 - <http://seanmcgrath.blogspot.com/JythonWebAppTutorialPart1.html>

Thank You

- (Question,Answer?)*