

Why Python?

Changes in the
last year

Some trivial
examples

Demo

Creating bindings

Future

Samba 4 Python Scripting

Jelmer Vernooij

Samba Team

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Agenda

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- ▶ Quicker development
- ▶ Easier to understand
 - ▶ Easy to use for system administrators
 - ▶ Lower barrier for contributions?

History of Samba and scripting

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- ▶ Samba 3.0 had python bindings
 - ▶ Removed because of lack of maintainance
 - ▶ Not used for any core infrastructure
- ▶ Samba 4 has embedded JavaScript
 - ▶ Originally used for SWAT, provisioning

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- ▶ Replaces EJS as internal scripting language
- ▶ Python is now a build-dependency
 - ▶ Easy to build from source, no dependencies
 - ▶ Ported to at least as much platforms as Samba
 - ▶ Available as standard package for most platforms
- ▶ The longer we would've waited, the more code we'd have to port

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- ▶ Comes “with batteries included”
 - ▶ No need to reimplement utility functions and bindings for Samba
- ▶ Easy to create bindings
- ▶ Most existing libraries already have Python bindings
 - ▶ GTK+, Qt, HTTP, .ini-parsers...
- ▶ Large existing developer base
 - ▶ Potential contributors
- ▶ Better scripting language
 - ▶ Nested functions
 - ▶ Modularity
- ▶ More development tools available
 - ▶ Debugger, profiler, code coverage analyser, ...

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What exactly is Python?

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- ▶ High-level general purpose scripting language
- ▶ Object-oriented, structured or functional programming
- ▶ Memory-managed, reference-counted
- ▶ Standardsized, several implementations
- ▶ Portable
- ▶ Created in '91



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What does it look like?

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Hello world!

```
print "Hello_World!"
```

Function usage

```
def addone(value):  
    return value + 1
```

Using modules

```
import unittest
```

Some interesting software in Python

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Written in Python:

- ▶ Original BitTorrent client
- ▶ Mailman
- ▶ Bazaar/Mercurial
- ▶ Trac
- ▶ Some apps in GNOME/KDE

Scriptable in Python

- ▶ Blender
- ▶ Amarok, Rhythmbox
- ▶ Vim
- ▶ Totem
- ▶ Epiphany

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Python in Samba 4!

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- ▶ pidl can now generate Python bindings
- ▶ SWIG used for binding several other libraries
- ▶ some bindings written manually
- ▶ now used instead of EJS in a lot of places
 - ▶ EJS still there but may be removed at a later point

Existing Samba Python bindings

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- ▶ Credentials
- ▶ SamDB
- ▶ Most DCE/RPC modules
- ▶ LDB
- ▶ TDB
- ▶ Registry
- ▶ Libnet

- ▶ Includes matching unit tests, so all bindings should work
- ▶ Bindings should be Pythonic rather than one-on-one wrappers of C functions

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Infrastructure in Python

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- ▶ Provisioning
- ▶ smbclient?
 - ▶ SoC student will work on this
 - ▶ Proof-of-concept will be interesting, may not be ideal as actual implementation
- ▶ SWAT
 - ▶ SoC student will work on this hopefully
- ▶ Samba-GTK
 - ▶ SoC student will work on this

Reading TDB files

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```
1 import tdb, sys
2
3 db = tdb.Tdb(sys.argv[1])
4 for (k, v) in db.items():
5     print "{"
6     print "key(%d) = %r" % (len(k), k)
7     print "data(%d) = %r" % (len(v), v)
8     print "}"
```

Using LDB

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```
1 #!/usr/bin/python
2
3 import ldb
4
5 conn = ldb.Ldb("msg.tdb")
6
7 conn.add({ "dn": "dc=samba,dc=org", "attr1": "foo" })
8
9 for msg in conn.search("dc=samba,dc=org"):
10     print str(msg.dn)
```

Connecting to LDAP using LDB

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```
1 #!/usr/bin/python
2
3 import ldb
4
5 # Connect to the LDAP server
6 conn = ldb.Ldb("ldap://ldap.abmas.org/")
7
8 for msg in conn.search("dc=samba,dc=org"):
9     print str(msg.dn)
```

Browsing the registry

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```
1 #!/usr/bin/python
```

Adding users

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```
1 #!/usr/bin/python
2 import samr, Isa
3
4 # Connect to the local SAM
5 conn = samr.samr("ncalrpc:", "st/dc/etc/smb.conf")
6
7 # Get SAMR connect handle
8 samr_handle = conn.Connect(0, 0xffffffff)
9
10 domainname = Isa.String()
11 domainname.string = u"SAMBADOMAIN"
12
13 sid = conn.LookupDomain(samr_handle, domainname)
14 print "Found sid %s for SAMBADOMAIN" % sid
15
16 conn.Close(samr_handle)
```

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Unit tests

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```
1 import winreg
2 from samba.tests import RpcInterfaceTestCase
3
4 class WinregTests(RpcInterfaceTestCase):
5     def setUp(self):
6         self.conn = winreg.winreg("ncalrpc:", self.get_load()
7
8     def test_hklm(self):
9         handle = self.conn.OpenHKLM(None,
10                         winreg.KEY_QUERY_VALUE | winreg.KEY_ENUMERATE
11         self.conn.CloseKey(handle)
```

Demo

Demo Time

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- ▶ We use SWIG, [http://www.swig.org/.](http://www.swig.org/)
- ▶ Hard to grasp language but very powerful

Missing bindings

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- ▶ NetBIOS
- ▶ SMB
- ▶ WINS
- ▶ CLDAP
- ▶ LDAP

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Where to get?

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- ▶ ldb
 - ▶ <http://ldb.samba.org/>
 - ▶ python-ldb in Debian/Ubuntu
- ▶ tdb
 - ▶ <http://tdb.samba.org/>
 - ▶ python-tdb in Debian/Ubuntu
- ▶ ... others:
 - ▶ Samba 4
 - ▶ ... not packaged yet, but hopefully soon

Learning more

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- ▶ www.python.org
- ▶ *pydoc <name>*
- ▶ pydoctor
- ▶ Maybe public API docs on Samba.org?

Future expansions

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- ▶ Port to Samba 3?
 - ▶ Need to make sure it stays maintained
- ▶ Help welcome :-)