Using Python and XMPP to build a decentralized social network

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FOSDEM

Saturday 30th January 2016

Some words about the project

- a lot of features
- other interfaces

about the technologies

- global architecture

Python !

- about the choice of Python
- some advantages

Twisted

Urwid

Pyjamas

- A New Hope

Things we have learned

- Salut à Vous

Some words about the project

Libervia/Salut à Toi is a Multipurpose, multi frontend communication tool

Some words about the project

- project started in 2008/2009
- Social Contract
  `http://salut-a-toi.org/social_contract.html`
- non profit association

Outline

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Some words about the project

- instant messaging (of course)
- end 2 end encryption
- P2P file sharing
- blog engine (decentralized !)
- lot of experimentations

General Contacts Groups Service Help Settings

disponible pour bavarder

« Contacts

Amis

XMPP

souliane@libervia.org

goffi@jabberfr.org

edhelas@movim.eu

goffi@libervia.org

souliane@jappix.com

Blog

Dave <souliane@movim.eu ⚠> on *2015-12-01 15:47:31* — *2015-12-01 15:49:14*

Libervia et Movim

XMPP libervia movim standard

Je suis connecté sur libervia.org avec mon compte de chez movim.eu.
C'est ça la puissance de la **standardisation**.
Bac + 2 les enfants...

XMPP

Update your subscription to the Jabber search directory.

Subscribed: ☑

Some words about you: Feel free to contact me

Submit Cancel

souliane@libervia.org (gone)

15:54 **[Dave]** Salut c'est Dave à l'appareil. J'ai à te parler.
15:54 **[souliane]** Si tu veux me parler, envoies-moi un fax.
15:54 **[souliane]** Ou bien tu peux aussi utiliser OTR.
Unverified conversation with souliane@libervia.org/primitivus started.
Your client is not logging this conversation.
15:55 **[Dave]** J'ai un problème avec mon mot de passe.
15:56 **[souliane]** Pas de problème, cette conversation est chiffrée.
The current conversation is now verified.
15:57 **[souliane]** Et maintenant, elle est même authentifiée.
15:57 **[Dave]** C'est la classe.

souliane@jappix.com (active)

15:51 **[Dave]** Allo Jappix, vous me recevez ?
15:52 **[Dino]** Évidemment. Qu'est-ce que tu croyais ?

Discussions Journal Amis +

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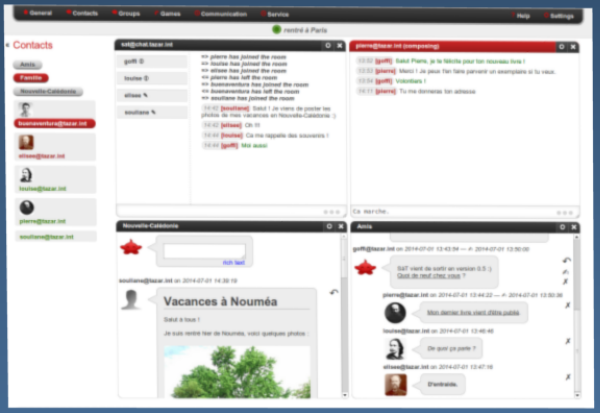
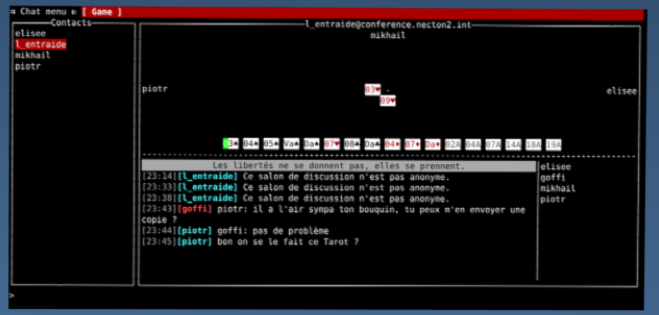
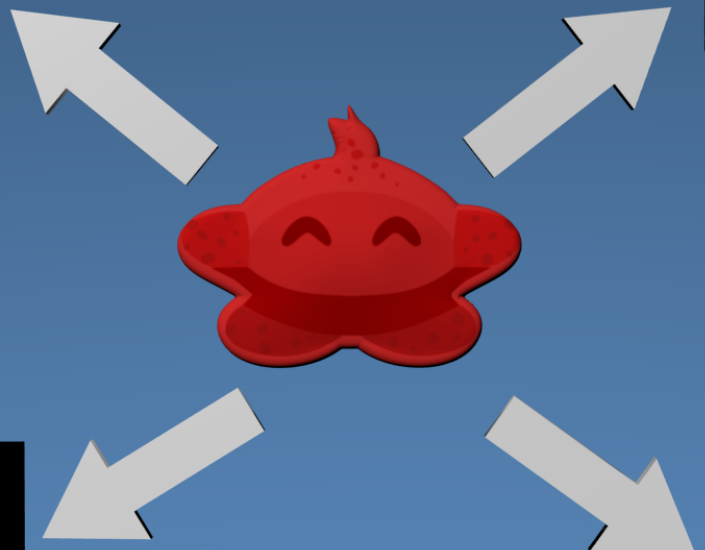
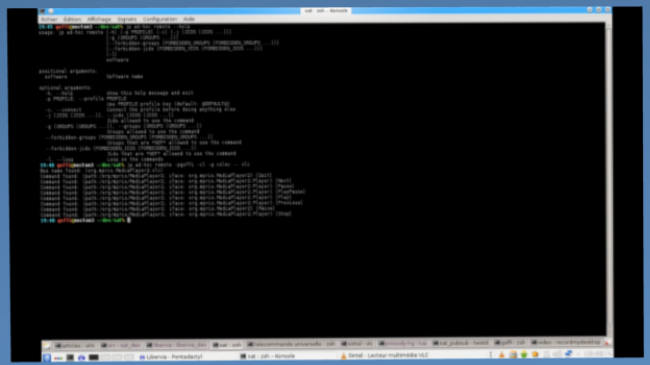

Contacts
Vacances à Nouméa


Chat menu
Game
Contacts
l_entraide@conference.necton2.int
mikhail
elisee
piotr
Les libertés ne se donnent pas, elles se prennent.
[23:14][l_entraide] Ce salon de discussion n'est pas anonyme.
[23:33][l_entraide] Ce salon de discussion n'est pas anonyme.
[23:38][l_entraide] Ce salon de discussion n'est pas anonyme.
[23:43][goffi] piotr: il a l'air sympa ton bouquin, tu peux m'en envoyer une copie ?
[23:44][piotr] goffi: pas de problème
[23:45][piotr] bon on se le fait ce Tarot ?
elisee
goffi
mikhail
piotr





mikhail
goffi
piotr
Games

other interfaces

- don't reinvent the wheel
- we use standards (XMPP)
- factorization

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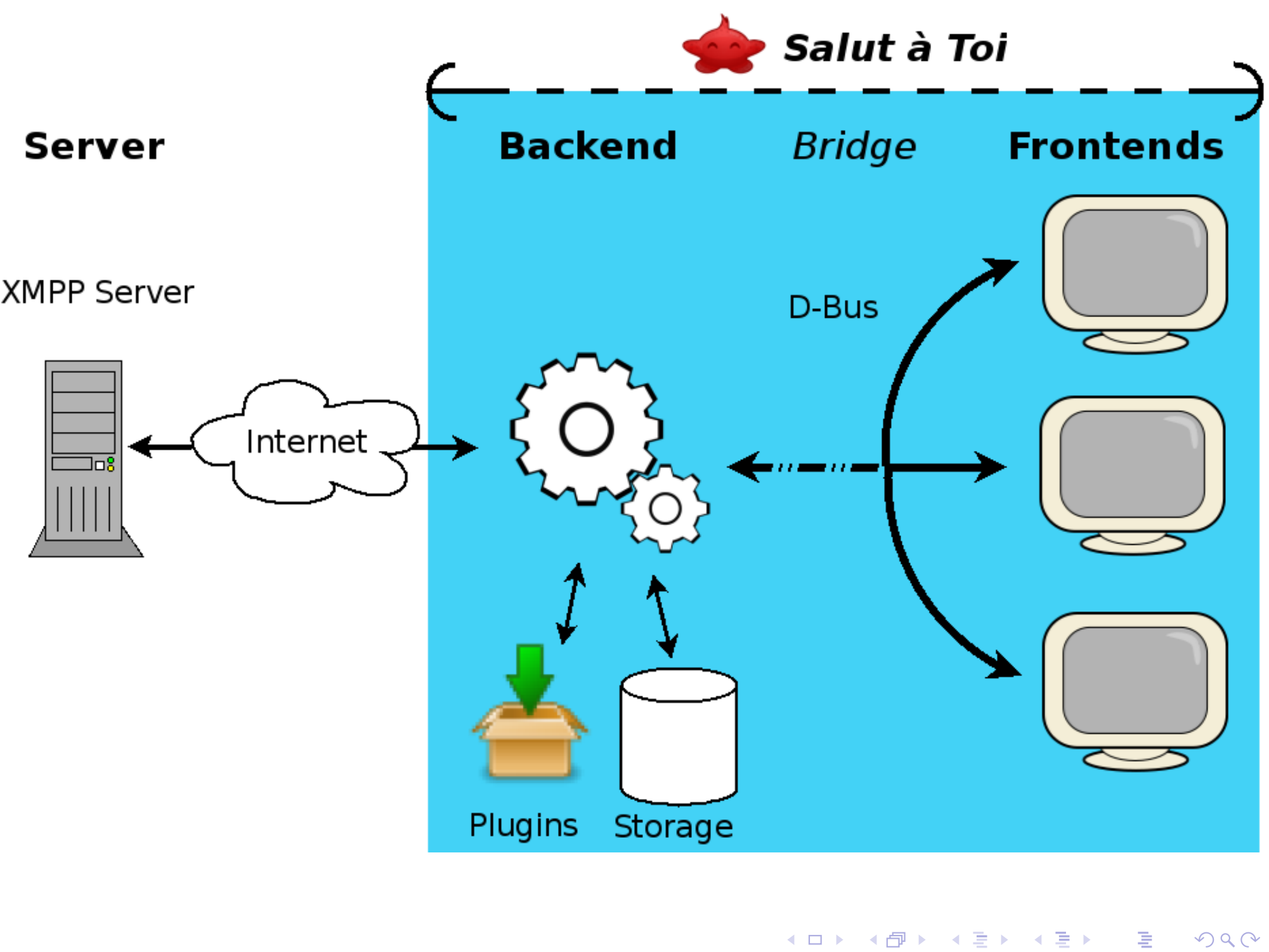
Salut à Toi
Server
Backend
Bridge
Frontends
XMPP Server
D-Bus
Internet
Plugins
Storage

Python !

we use Python everywhere we can

- **Twisted** (backend, web frontend)
- ~~curses~~ **Urwid** (console frontend)
- **Pyjamas** (web frontend)
- ~~WxWidgets~~ **Kivy** *to be done*
- **Jinja** (web frontend)

. . . and sometime we don't

- Qt/C++ (Desktop frontend)

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about the choice of Python

- speed (execution)

about the choice of Python

- speed (execution)
  - pypy
  - cython
  - C/C++ inclusion

about the choice of Python

- speed (execution)
  - pypy
  - cython
  - C/C++ inclusion
- speed (development)
- popular (libraries)
- popular (similar projects)
- popular (tools)

tools

- Mercurial
- BuildBot
- D-Feet

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some advantages

- debugging (pudb & ipdb)
- stability (Python & Twisted)
- workaround/monkey patching
- standard library (re, argparse, dom, urlparse/urllib)
- Python is fun !

Twisted

- asynchronous
- huge framework
- well thought abstractions
- test driven development

Twisted

- Deferred

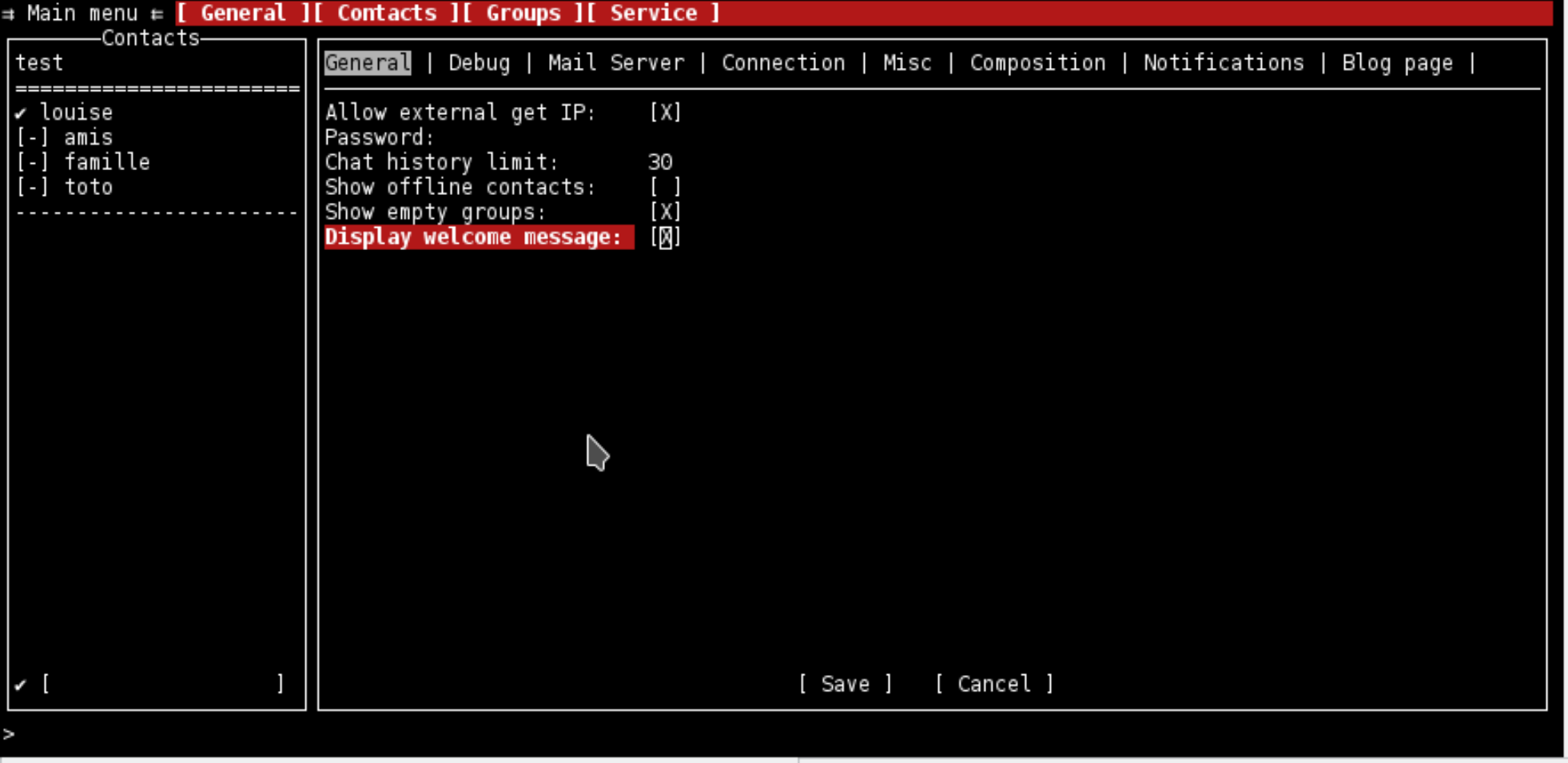
```
def fosdemTalkCb(self, result):
    print u"OK! {}".format(result)

def fosdemTalkEb(self, failure):
    print u"Disaster! {}".format(failure)

d = getFosdemTalkOpinion()
d.addCallbacks(self.fosdemTalkCb, fosdemTalkEb)
```

- inline callbacks

```
@defer.inlineCallbacks
def fosdemTalkPoll(self):
    try:
        opinion = yield getFosdemTalkOpinion()
    except BadTalkException as failure:
        print u"Disaster! {}".format(failure)
    else:
        print u"OK! {}".format(opinion)
```

Urwid

- D-Bus integration
- good widgets set
- customization
- lot of nice stuff (resizing, keys, etc)
- it just works !


≡ Main menu ≡ [General][Contacts][Groups][Service]
Contacts
test
louise
[-] amis
[-] famille
[-] toto
General | Debug | Mail Server | Connection | Misc | Composition | Notifications | Blog page |
Allow external get IP: [X]
Password:
Chat history limit: 30
Show offline contacts: [ ]
Show empty groups: [X]
Display welcome message: [X]
[Save] [Cancel]
>
primitivus : primitivus_dev

Pyjamas

- Python $\longrightarrow$ JavaScript transpiler
- very active at the time
- a GWT port
- handle browsers incompatibilities
- main advantages for us :
  - factorization
  - no context switch

Pyjamas

but. . .

- it's nearly Python, but it's not Python
- heavy and ugly pages (code)
- difficult to debug
- no luck to move to Python 3
- project hijacked
- and now dead

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A New Hope

Brython

A New Hope

Brython

- not a compiler, an interpreter
- Python 3
- Python test suite
- active
- debugger
- stay close to HTML

Things we have learned

- stay focused
- new technologies can wait
- look for the community
- and the stability

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Thanks for your attention

- `http://salut-a-toi.org` (official website)
- `https://www.libervia.org` (démo)
- goffi@goffi.org (courriel)
- goffi@jabber.fr (jid)

or meet me in Prague !