

Thinking Inside the Box: Embedded Active Directory / Storage Appliances Based on Samba

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SAMBA Team

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Outline

Introduction

- The Abouts

- Hardware Used

- Software Used

Implementation

- Front End

- Back End

- Alternatives

- ToDos

Demo

The Abouts

- ▶ About Myself
- ▶ About Samba
- ▶ About This Talk

About Myself

- ▶ M.Sc. in computational biology



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- ▶ M.Sc. in computational biology
- ▶ Ph.D. student in microbiology



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- ▶ Samba Team member



About Samba

- ▶ Almost 20 years of file serving support

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- ▶ 2.7 million lines of code

About Samba

- ▶ Almost 20 years of file serving support
- ▶ 2.7 million lines of code
- ▶ 20 committers in the last month

About This Talk

- ▶ Proof-of-concept presentation

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- ▶ No product out there (yet)

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- ▶ Proof-of-concept presentation
- ▶ No product out there (yet)
- ▶ Remaining work: Hooking up features in UI

Hardware Used

- ▶ Dockstar
- ▶ BeagleBoard XM
- ▶ Trim Slice

- ▶ 1.2 GHz ARMv5 CPU



Source:
<http://archlinuxarm.org/platforms/armv5/seagate-dockstar>

- ▶ 1.2 GHz ARMv5 CPU
- ▶ 128 MB RAM



Source:
<http://archlinuxarm.org/platforms/armv5/seagate-dockstar>

- ▶ 1.2 GHz ARMv5 CPU
- ▶ 128 MB RAM
- ▶ 4 USB ports



Source:
<http://archlinuxarm.org/platforms/armv5/seagate-dockstar>

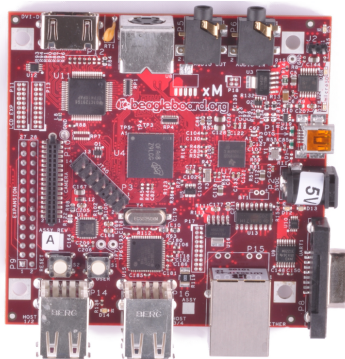
- ▶ 1.2 GHz ARMv5 CPU
- ▶ 128 MB RAM
- ▶ 4 USB ports
- ▶ GbE



Source:
<http://archlinuxarm.org/platforms/armv5/seagate-dockstar>

BeagleBoard XM

- ▶ 1 GHz ARMv7 Cortex A8 CPU

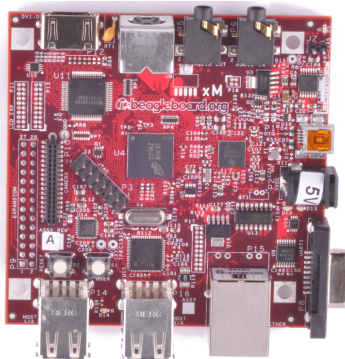


Source:

<http://www.flickr.com/photos/jadon/4628635196/>

BeagleBoard XM

- ▶ 1 GHz ARMv7 Cortex A8 CPU
- ▶ 512 MB RAM

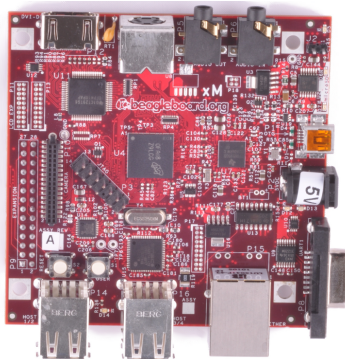


Source:

<http://www.flickr.com/photos/jadon/4628635196/>

BeagleBoard XM

- ▶ 1 GHz ARMv7 Cortex A8 CPU
- ▶ 512 MB RAM
- ▶ 5 USB ports

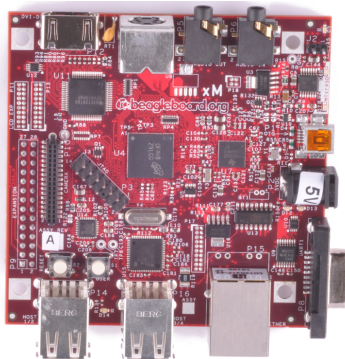


Source:

<http://www.flickr.com/photos/jadon/4628635196/>

BeagleBoard XM

- ▶ 1 GHz ARMv7 Cortex A8 CPU
- ▶ 512 MB RAM
- ▶ 5 USB ports
- ▶ 100 MbE



Source:

<http://www.flickr.com/photos/jadon/4628635196/>

- ▶ 1 GHz ARMv7 Cortex A9 dual-core CPU



Source:
<http://archlinuxarm.org/platforms/armv7/trimslice>

TrimSlice

- ▶ 1 GHz ARMv7 Cortex A9 dual-core CPU
- ▶ 1024 MB RAM



Source:
<http://archlinuxarm.org/platforms/armv7/trimslice>

TrimSlice

- ▶ 1 GHz ARMv7 Cortex A9 dual-core CPU
- ▶ 1024 MB RAM
- ▶ 4 USB ports



Source:
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TrimSlice

- ▶ 1 GHz ARMv7 Cortex A9 dual-core CPU
- ▶ 1024 MB RAM
- ▶ 4 USB ports
- ▶ SATA



Source:
<http://archlinuxarm.org/platforms/armv7/trimslice>

TrimSlice

- ▶ 1 GHz ARMv7 Cortex A9 dual-core CPU
- ▶ 1024 MB RAM
- ▶ 4 USB ports
- ▶ SATA
- ▶ GbE



Source:
<http://archlinuxarm.org/platforms/armv7/trimslice>

Software Used

- ▶ Arch Linux ARM
- ▶ Samba 4
- ▶ Pylons

Arch Linux ARM



- ▶ ARM port of Arch Linux

Arch Linux ARM



- ▶ ARM port of Arch Linux
- ▶ Supports ARMv5 – ARMv7 hardware



- ▶ ARM port of Arch Linux
- ▶ Supports ARMv5 – ARMv7 hardware
- ▶ Lightweight

Arch Linux ARM



- ▶ ARM port of Arch Linux
- ▶ Supports ARMv5 – ARMv7 hardware
- ▶ Lightweight
- ▶ Active community

- ▶ Current release: Samba 4 alpha 17

Samba 4

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- ▶ Some features missing

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- ▶ AD core support pretty stable

Samba 4

- ▶ Current release: Samba 4 alpha 17
- ▶ Some features missing
- ▶ AD core support pretty stable
- ▶ Provides Python bindings for most libraries



Pylons Framework

- ▶ Python WSGI framework



Pylons Framework

- ▶ Python WSGI framework
- ▶ Modular architecture



Pylons Framework

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- ▶ Modular architecture
- ▶ paster based deployment



Pylons Framework

- ▶ Python WSGI framework
- ▶ Modular architecture
- ▶ paster based deployment
- ▶ Mako template engine

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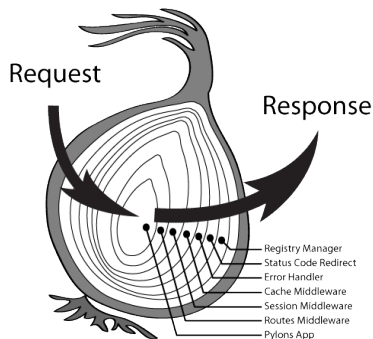
- ToDos

Demo

- ▶ Pylons architecture
- ▶ SWAT4 architecture
- ▶ Features needed

Pylons Architecture

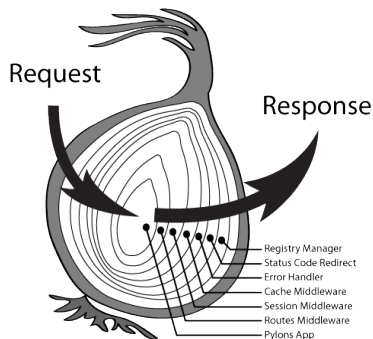
- ▶ Layered WSGI (PEP333) applications



Source:
<https://docs.pylonsproject.org/projects/pylons.framework/dev/concepts.html>

Pylons Architecture

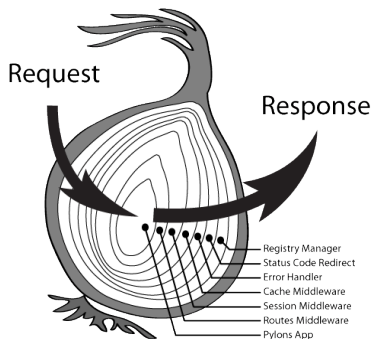
- ▶ Layered WSGI (PEP333) applications
- ▶ Outer layers provide common functionality



Source:
<https://docs.pylonsproject.org/projects/pylons.framework/dev/concepts.html>

Pylons Architecture

- ▶ Layered WSGI (PEP333) applications
- ▶ Outer layers provide common functionality
- ▶ Core is own code



Source:
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- ▶ MVC design

SWAT4 Architecture

- ▶ MVC design
- ▶ Model calls Samba python bindings

SWAT4 Architecture

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- ▶ Model calls Samba python bindings
- ▶ View is AJAX-based

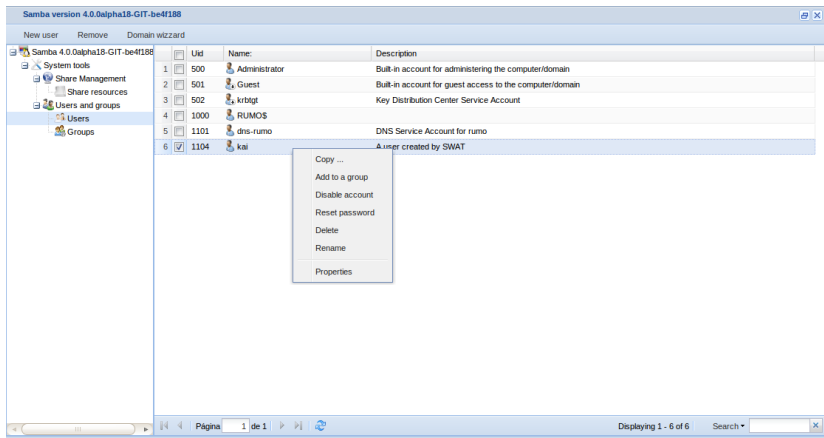
SWAT4 Architecture

- ▶ MVC design
- ▶ Model calls Samba python bindings
- ▶ View is AJAX-based
- ▶ Controller provides RESTful interface

Features

- ▶ User Management
- ▶ Group Management
- ▶ Share Management

User Management



Group Management

Samba version 4.0.0alpha18-GIT-be4f188

New group Remove Domain wizard

System tools
Share Management
Share resources
Users and groups
Groups

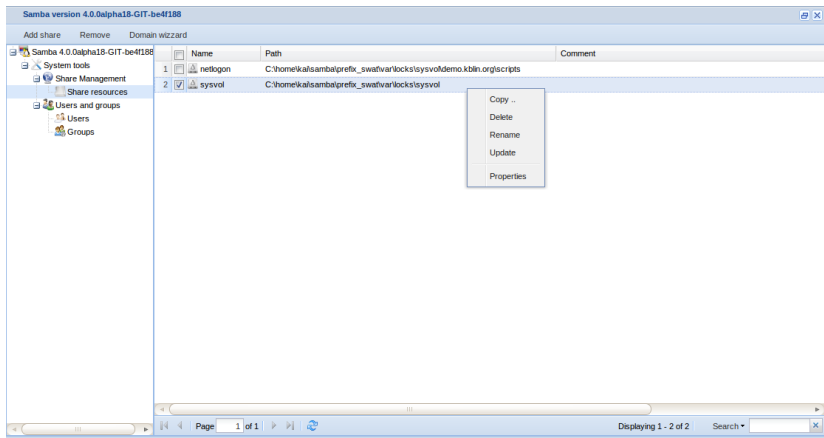
	Gid	Name:	Description
1	498	Enterprise Read-Only Domain Contro	Members of this group are Read-Only Domain Controllers in the enterprise
2	512	Domain Admins	Designated administrators of the domain
3	513	Domain Users	All domain users
4	514	Domain Guests	All domain guests
5	515	Domain Computers	All workstations and servers joined to the domain
6	516	Domain Controllers	All domain controllers in the domain
7	518	Schema Admins	Designated administrators of the schema
8	519	Enterprise Admins	Designated administrators of the enterprise
9	520	Group Policy Creator Owners	Members in this group can modify group policy for the domain
10	521	Read-Only Domain Controllers	Members of this group are Read-Only Domain Controllers in the domain
11	1103	DnsUpdateProxy	DNS clients who are permitted to perform dynamic updates on behalf of some other clients (such as DHCP servers).

Copy ...
Delete
Rename
Properties

Página 1 de 1

Displaying 1 - 11 of 11 Search

Share Management



- ▶ Samba 4 python bindings
- ▶ Config file generation

Python Bindings

- ▶ Generated from IDL

Python Bindings

- ▶ Generated from IDL
- ▶ Provides access to all IDL-based RPC

Python Bindings

- ▶ Generated from IDL
- ▶ Provides access to all IDL-based RPC
- ▶ Feels very C-like

Config File Generation

- ▶ No registry-based configuration in Samba4 yet

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- ▶ Need to create krb5.conf and BIND config

Config File Generation

- ▶ No registry-based configuration in Samba4 yet
- ▶ Need to create krb5.conf and BIND config
- ▶ S4 does not reload config file for new connections

Alternatives

- ▶ Webmin

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- ▶ S3 SWAT

Alternatives

- ▶ Webmin
- ▶ S3 SWAT
- ▶ Different S4 SWAT implementation

- ▶ More AD-related functionality in UI

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- ▶ Fully automated provisioning

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- ▶ Fully automated provisioning
- ▶ Share management that works

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DEMO

Thank you

► Questions?