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

Kai Blin

kai@samba.org

SAMBA Team

2011-09-21

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Outline

Introduction The Abouts Hardware Used Software Used

Implementation Front End Back End Alternatives ToDos

Demo

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Embedded AD appliance w/Samba (2 / 30)

The Abouts

- About Myself
- About Samba
- About This Talk

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M.Sc. in computational biology



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Embedded AD appliance w/Samba (4 / 30)

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



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- M.Sc. in computational biology
- Ph.D. student in microbiology
- Open Source developer



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Embedded AD appliance w/Samba (4 / 30)

- M.Sc. in computational biology
- Ph.D. student in microbiology
- Open Source developer
- Samba Team member



Embedded AD appliance w/Samba (4 / 30)

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Almost 20 years of file serving support

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Embedded AD appliance w/Samba (5 / 30)

- Almost 20 years of file serving support
- ▶ 2.7 million lines of code

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Embedded AD appliance w/Samba (5 / 30)

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

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Proof-of-concept presentation

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- Proof-of-concept presentation
- 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

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Hardware Used

- Dockstar
- BeagleBoard XM
- Trim Slice

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Dockstar

▶ 1.2 GHz ARMv5 CPU



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

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1.2 GHz ARMv5 CPU

128 MB RAM



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

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Dockstar

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



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

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Dockstar

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



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

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1 GHz ARMv7 Cortex A8 CPU



Source: http://www.flickr.com/photos/jadon/4628635196/

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Embedded AD appliance w/Samba (9 / 30)

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- 1 GHz ARMv7 Cortex A8 CPU
- 512 MB RAM



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



Source: http://www.flickr.com/photos/jadon/4628635196/

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



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Embedded AD appliance w/Samba (9 / 30)

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 1 GHz ARMv7 Cortex A9 dual-core CPU



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

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



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

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



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

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



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

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Embedded AD appliance w/Samba (10 / 30)

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



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

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- Arch Linux ARM
- Samba 4
- Pylons

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ARM port of Arch Linux

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Embedded AD appliance w/Samba (12 / 30)



- ARM port of Arch Linux
- Supports ARMv5 ARMv7 hardware

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Embedded AD appliance w/Samba (12 / 30)



- ARM port of Arch Linux
- Supports ARMv5 ARMv7 hardware
- Leightweight

Embedded AD appliance w/Samba (12 / 30)



- ARM port of Arch Linux
- Supports ARMv5 ARMv7 hardware
- Leightweight
- Active community

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Embedded AD appliance w/Samba (12 / 30)

Current release: Samba 4 alpha 17

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Embedded AD appliance w/Samba (13 / 30)

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- Current release: Samba 4 alpha 17
- Some features missing

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Embedded AD appliance w/Samba (13 / 30)

- Current release: Samba 4 alpha 17
- Some features missing
- AD core support pretty stable

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Embedded AD appliance w/Samba (13 / 30)

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

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Python WSGI framework

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Pylons

Pylons Framework

- Python WSGI framework
- Modular architecture

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Pylons

Pylons Framework

- Python WSGI framework
- Modular architecture
- paster based deployment

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Pylons

Pylons Framework

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

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Outline

Introduction The Abouts Hardware Used Software Used

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Demo

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Front End

- Pylons architecture
- SWAT4 architecture
- Features needed

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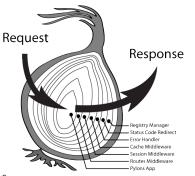
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Pylons Architecture

 Layered WSGI (PEP333) applications



Source: https://docs.pylonsproject.org/projects/pylons_framework/ dev/concepts.html

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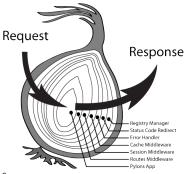
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Pylons Architecture

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



Source: https://docs.pylonsproject.org/projects/pylons_framework/ dev/concepts.html

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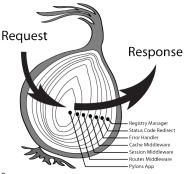
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Pylons Architecture

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



Source: https://docs.pylonsproject.org/projects/pylons_framework/ dev/concepts.html

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MVC design

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- MVC design
- Model calls Samba python bindings

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- MVC design
- Model calls Samba python bindings
- View is AJAX-based

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

Embedded AD appliance w/Samba (18 / 30)

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Features

- User Management
- Group Management
- Share Management

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User Management

Samba version 4.0.0alpha18-GIT-be41188								
New user Remove Domain wizzard								
🖃 🌄 Samba 4.0.0alpha18-GIT-be4f188		Uid	Name:		Description			
System tools Share Management Share resources Share resources	1	500	Å Administrator		Built-in account for administering the computer/domain			
	2 📃	501	🛃 Guest		Built-in account for guest access to the computer/domain			
	3 🕅	502	🛃 krbtgt		Key Distribution Center Service Account			
- ² Users	4 📰	1000	& RUMO\$					
- 🎎 Groups	5 🕅	1101	💄 dns-rumo		DNS Service Account for rumo			
	6	1104	g kai	Copy Add to a group Disable accoun Reset passwor Delete Rename Properties	A single created by SWAT			
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Group Management

Samba version 4.0.0alpha18-GIT-b	pe4f1	88					8>
New group Remove Domain	in wiz	zaro	1				
😑 📆 Samba 4.0.0alpha18-GIT-be4f188			Gid	Name:		Descripcion	
System tools			498	Read-On	ly Domain Contro	Members of this group are Read-Only Domain Controllers in the enterprise	
Share Management Share resources Stare resources Stare and groups Stare sand groups	2		512	Somain Admins		Designated administrators of the domain	
	3		513	餐 Domain Users		All domain users	
	4		514	🍇 Domain Guests		All domain guests	
Sroups .	5	515 🍇 Domain Computers			All workstations and servers joined to the domain		
	6		516	Real Domain Controllers		All domain controllers in the domain	
	7		518	Schema Admins		Designated administrators of the schema	
			519	Senterprise Admins		Designated administrators of the enterprise	
			520	Sroup Policy Create	r Owners	Members in this group can modify group policy for the domain	
			521	Read-Only Domain	Controllers	Members of this group are Read-Only Domain Controllers in the domain	
			1103	South Consumer Consus		DNS clients who are permitted to perform dynamic updates on behalf of some other clients (such as DHCP servers).	
					Copy Delete Rename Properties		
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Share Management

Samba version 4.0.0alpha18-GIT-	Samba version 4.0.0alpha18-GIT-be41188						
Add share Remove Domain wizzard							
😑 📆 Samba 4.0.0alpha18-GIT-be4f18	B 📄 Name	Path		Comment			
System tools Share Management	1 🕅 🔬 netlogon	C:\home\kai\samba\prefix_swat\var\locks\sysvol\demo	kblin.org\scripts				
Share resources	2 🔽 🔮 sysvol	C:\home\kai\samba\prefix_swat\var\locks\sysvol					
🗄 🍇 Users and groups	1		Copy				
- 🥵 Users			Delete				
- M Groups			Rename				
			Update				
			Properties				
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- Samba 4 python bindings
- Config file generation

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Python Bindings

Generated from IDL

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

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Embedded AD appliance w/Samba (24 / 30)

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

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Embedded AD appliance w/Samba (24 / 30)

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No registry-based configuration in Samba4 yet

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- No registry-based configuration in Samba4 yet
- Need to create krb5.conf and BIND config

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Embedded AD appliance w/Samba (25 / 30)

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

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Alternatives

Webmin

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Alternatives

- Webmin
- S3 SWAT

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Alternatives

- Webmin
- S3 SWAT
- Different S4 SWAT implementation

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More AD-related functionality in UI

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- More AD-related functionality in UI
- Fully automated provisioning

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- More AD-related functionality in UI
- Fully automated provisioning
- Share management that works

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Thank you

Questions?

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