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

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.SAMBA  Team

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The Abouts

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

- M.Sc. in computational biology

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About Myself

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

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

- Almost 20 years of file serving support
About Samba

- Almost 20 years of file serving support
- 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
About This Talk

- Proof-of-concept presentation
- No product out there (yet)
About This Talk

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

- Dockstar
- BeagleBoard XM
- Trim Slice
Dockstar

- 1.2 GHz ARMv5 CPU

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

- 1.2 GHz ARMv5 CPU
- 128 MB RAM

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

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

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

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

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

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

- ARM port of Arch Linux

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Arch Linux ARM

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

- 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

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

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

Pylons Framework

- Python WSGI framework
Pylons Framework

- Python WSGI framework
- Modular architecture
Pylons Framework

- Python WSGI framework
- Modular architecture
- paster based deployment
Pylons Framework

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

Introduction
  The Abouts
  Hardware Used
  Software Used

Implementation
  Front End
  Back End
  Alternatives
  ToDos

Demo
Front End

- Pylons architecture
- SWAT4 architecture
- Features needed
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

Kai Blin CC-BY-SA 3.0 Embedded AD appliance w/Samba (17 / 30)
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
SWAT4 Architecture

- MVC design
SWAT4 Architecture

- MVC design
- Model calls Samba python bindings
SWAT4 Architecture

- MVC design
- 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

![Samba version 4.0.0alpha18-GIT-be1f188](image)

- **New user**
- **Remove**
- **Domain wizard**

### Users and groups
- **System tools**
- **Share management**
- **Users and groups**
  - **Users**
  - **Groups**

#### Users and groups

- **Ud**
- **Name**
- **Description**

<table>
<thead>
<tr>
<th>Ud</th>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>500</td>
<td>Administrator</td>
<td>Built-in account for administering the computer/domain</td>
</tr>
<tr>
<td>501</td>
<td>Guest</td>
<td>Built-in account for guest access to the computer/domain</td>
</tr>
<tr>
<td>502</td>
<td>krbtgt</td>
<td>Key Distribution Center Service Account</td>
</tr>
<tr>
<td>1000</td>
<td>RUMOS</td>
<td>DNS Service Account for rumo</td>
</tr>
<tr>
<td>1101</td>
<td>dns.rumo</td>
<td>DNS Service Account for rumo</td>
</tr>
<tr>
<td>1104</td>
<td>kai</td>
<td>User created by SWAT</td>
</tr>
</tbody>
</table>

- **Copy**
- **Add to group**
- **Disable account**
- **Reset password**
- **Delete**
- **Rename**
- **Properties**
## Samba version 4.0.0alpha18-GIT-bef188

### Groups

<table>
<thead>
<tr>
<th>Gid</th>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>498</td>
<td>Enterprise Read-Only Domain Controllers</td>
<td>Members of this group are Read-Only Domain Controllers in the enterprise</td>
</tr>
<tr>
<td>512</td>
<td>Domain Admins</td>
<td>Designated administrators of the domain</td>
</tr>
<tr>
<td>513</td>
<td>Domain Users</td>
<td>All domain users</td>
</tr>
<tr>
<td>514</td>
<td>Domain Guests</td>
<td>All domain guests</td>
</tr>
<tr>
<td>515</td>
<td>Domain Computers</td>
<td>All workstations and servers joined to the domain</td>
</tr>
<tr>
<td>516</td>
<td>Domain Controllers</td>
<td>All domain controllers in the domain</td>
</tr>
<tr>
<td>518</td>
<td>Schema Admins</td>
<td>Designated administrators of the schema</td>
</tr>
<tr>
<td>519</td>
<td>Enterprise Admins</td>
<td>Designated administrators of the enterprise</td>
</tr>
<tr>
<td>520</td>
<td>Group Policy Creator Owners</td>
<td>Members in the group can modify group policy for the domain</td>
</tr>
<tr>
<td>521</td>
<td>Read-Only Domain Controllers</td>
<td>Members of this group are Read-Only Domain Controllers in the domain</td>
</tr>
<tr>
<td>1103</td>
<td>DnsUpdateProxy</td>
<td>DNS clients who are permitted to perform dynamic updates on behalf of some other clients (such as DHCP servers).</td>
</tr>
</tbody>
</table>

**Group Management**
Back End

- 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
Config File Generation

- No registry-based configuration in Samba4 yet
- 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
Alternatives

- Webmin
- S3 SWAT
Alternatives

- Webmin
- S3 SWAT
- Different S4 SWAT implementation
ToDos

- More AD-related functionality in UI
ToDos

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

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

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Demo
DEMO
Thank you

Questions?