

# Personal Password Manager in the Private Cloud

# The Issue

- Passwords are either...
  - Too easy to guess
  - Too easy to bruteforce
- Or...
  - Too difficult to remember

# Use a password manager

- Trusting someone else with your data
  - Synchronization by upload to remote server
- No synchronization of data
  - Stored on the local device

# Hosting A Solution Yourself

- Private Cloud
- Not that expensive anymore
  - Small low-powered devices such as Raspberry Pi
- Complete control of data

# What do we need?

(excerpt from the complete list of requirements)

- Distributed password database
- Multi-user support
  - Albeit solution should be aimed at individuals
- Password organization, in multiple levels
- Password sharing (for convenience)
- Passwords only ever appear in clear text client-side
- Auditing
- Two-factor authentication

And most importantly...

Something the user **wants** to use!

So... What already  
exists?


# Reviewed Commercially Available Tools

- In-Browser Password Managers
- LastPass, and Similar Solutions
- KeePass, and Similar Solutions
- Rattic
- Encryptr
- Vault
- TeamPasswordManager



... But none fulfill the  
requirements in a  
satisfactory way!

# Most are aimed at teams

 RatticDB


Passwords

Change Queue 17

Staff Management

Help

Search



You

Welcome Admin.

Profile Logout

Tags

- #pass

Groups

- DevelopmentTeam1
- DevelopmentTeam2

## All passwords

Add New

Delete

Add to Change Queue

Apply a Tag

Download Keepass

<input type="checkbox"/>	Title ^	User	Owner Group	Viewer Groups	Tags
<input type="checkbox"/>	* PasswordTitle1	Username1	DevelopmentTeam1		
<input type="checkbox"/>	@ PasswordTitle2	Username2	DevelopmentTeam2		
<input type="checkbox"/>	🔔 PasswordTitle3	Username3	DevelopmentTeam2		

Prev

1

Next

Password management powered by RatticDB, built by @smarthall and @zemmiph0bia. | [Report an issue](#) | [Contact Us](#)

# Most are aimed at teams

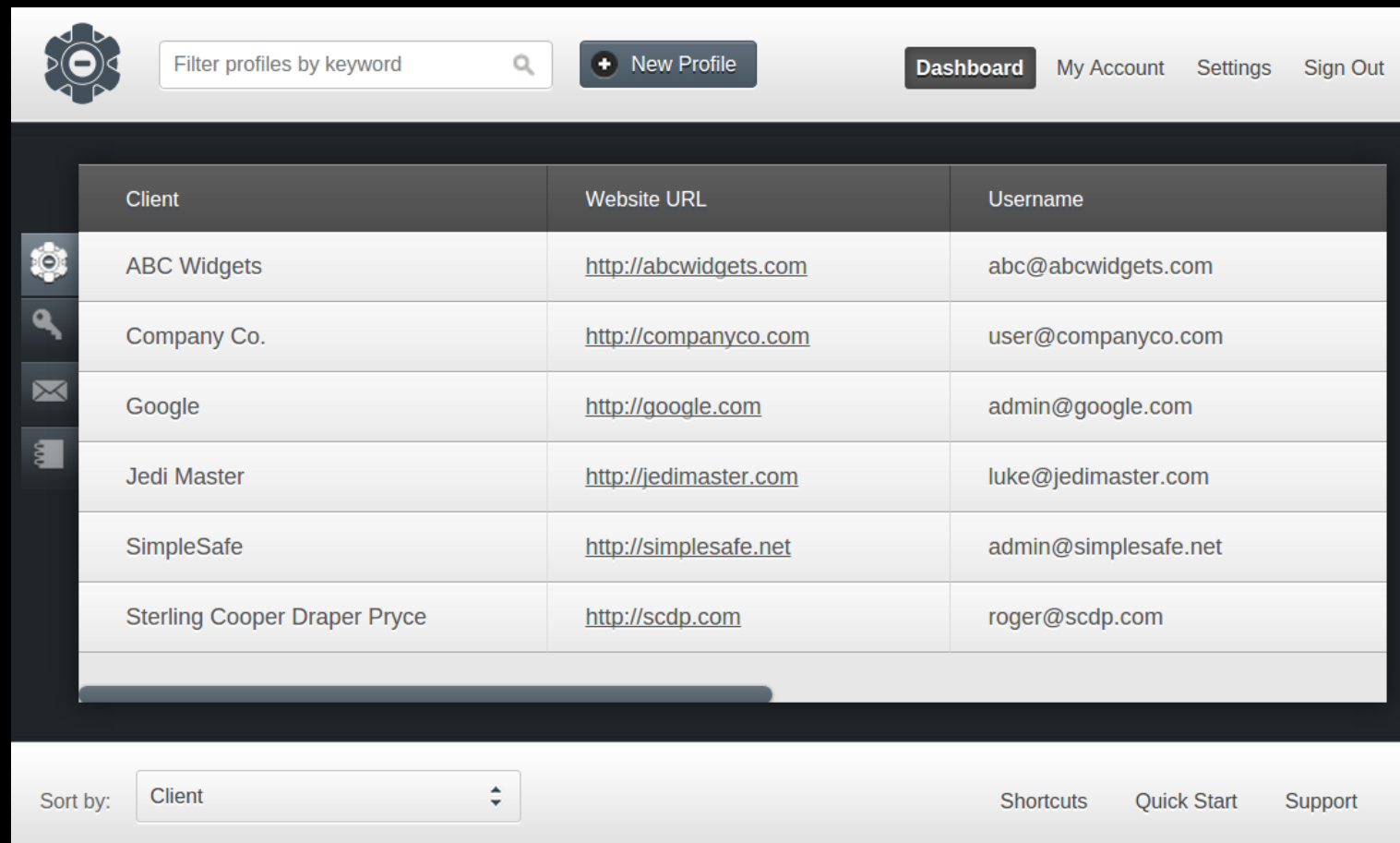
The screenshot displays the Team Password Manager web interface. At the top, there is a navigation bar with links for Home, Users / Groups, Log, and Settings. The user is logged in as John Boss, and there are links for My Passwords and Logout. Below the navigation bar, there are buttons for New Password and New Project, and a search bar labeled Search Passwords. On the left side, there is a Filter Tree with options for Passwords (Recent, Favorite, Active 56, All 69, Archived 13) and Projects. The main content area is a table with columns: Name / Project, Access / Username / Email / Password / Expiry, and Updated. The table lists several entries, including TEST, Wordpress admin, Ftp, Delicious bookmarks, iMybackup account, and Amazon. Each entry has a Show button and a star icon. On the right side, there are two filter sections: Filter by Project and Filter by Tag. The Filter by Project section shows a list of projects with their counts, and the Filter by Tag section shows a list of tags with their counts. At the bottom, there is a footer with links for Team Password Manager, teampasswordmanager.com, EULA and other licenses, Help, and Advanced Search Help. A red banner at the bottom contains the following text: "This is a demo of Team Password Manager. Data is reset everyday at 02:00 AM (PDT / GMT - 7). Any feedback is greatly appreciated: <http://teampasswordmanager.com/support/suggest-a-feature/> Download Team Password Manager and install it on your own server: <http://teampasswordmanager.com/download/>".

Name / Project	Access / Username / Email / Password / Expiry	Updated
TEST Test	<a href="#">Show</a>	Dec 7, 2015
Wordpress admin www.fictionalgadgetsitesite.com wordpress	<a href="#">http://www.fictionalgadgetsitesite.com/...</a> admin_sg <a href="#">Show</a>	Dec 7, 2015
Ftp www.fictionalgadgetsitesite.com ftp	<a href="#">sftp://www.fictionalgadgetsitesite.com</a> sftp <a href="#">Show</a>	Dec 7, 2015
Delicious bookmarks Company internet services delicious social	<a href="#">https://delicious.com/ourcompany</a>	Dec 7, 2015
iMybackup account Company internet services backup	<a href="#">http://ourcompany.imybkcctinvented...</a> ourcemail@ourcdomain.com <a href="#">Show</a>	Dec 7, 2015
Amazon www.fictionalgadgetsitesite.com amazon	<a href="#">http://www.amazon.com</a> info@fictionalgadgetsitesite.com <a href="#">Show</a>	Dec 7, 2015

Team Password Manager · [teampasswordmanager.com](http://teampasswordmanager.com) · EULA and other licenses · [Help](#) · [Advanced Search Help](#)

This is a demo of Team Password Manager. Data is reset everyday at 02:00 AM (PDT / GMT - 7).  
Any feedback is greatly appreciated: <http://teampasswordmanager.com/support/suggest-a-feature/>  
Download Team Password Manager and install it on your own server: <http://teampasswordmanager.com/download/>

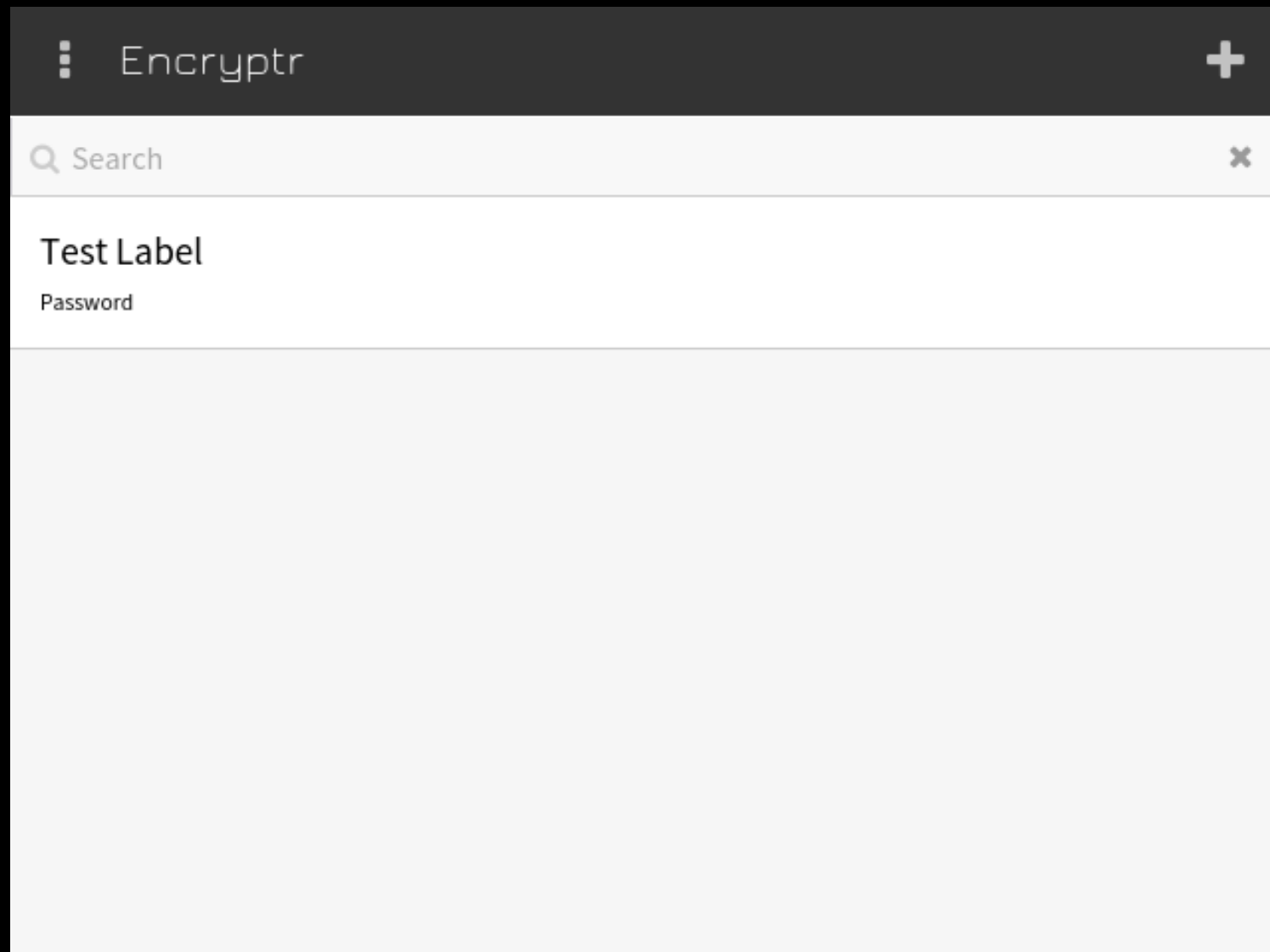
# Some have simply been discontinued since...



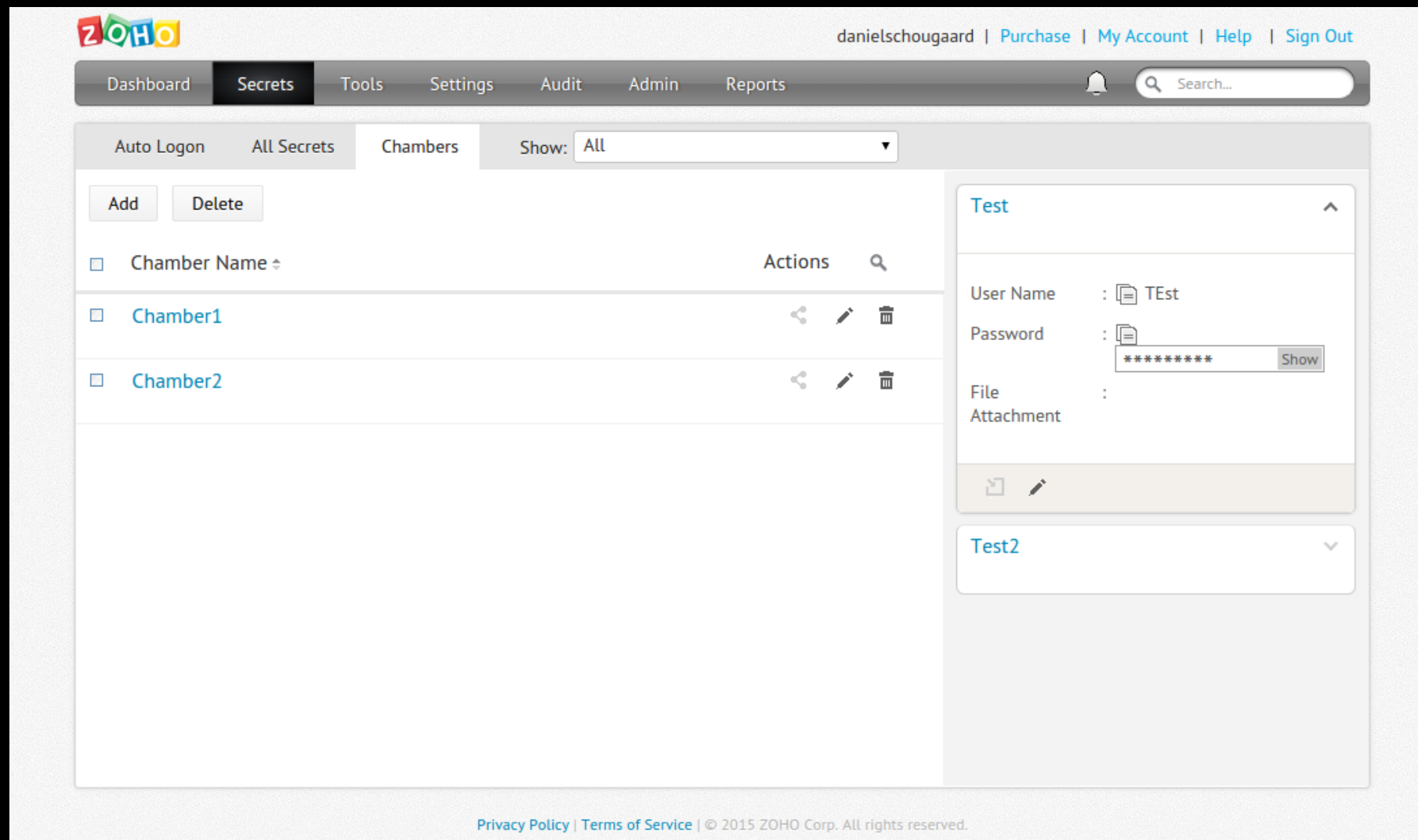
Client	Website URL	Username
ABC Widgets	<a href="http://abcwidgets.com">http://abcwidgets.com</a>	abc@abcwidgets.com
Company Co.	<a href="http://companyco.com">http://companyco.com</a>	user@companyco.com
Google	<a href="http://google.com">http://google.com</a>	admin@google.com
Jedi Master	<a href="http://jedimaster.com">http://jedimaster.com</a>	luke@jedimaster.com
SimpleSafe	<a href="http://simplesafe.net">http://simplesafe.net</a>	admin@simplesafe.net
Sterling Cooper Draper Pryce	<a href="http://scdp.com">http://scdp.com</a>	roger@scdp.com

*“..., we have made the tough decision to remove SimpleSafe for sale and cease to actively develop the product.”*

# Some lack organization




# Some invent their own organization



# Some doesn't even tell which platform it runs on

You are using Demo account. Sign up now and get 3 free months instead of 14 days.

 **Passwork** [Explore features](#) [Download plugins](#) [New features](#) [Demo Account \(password: demodemo\)](#)

Add group

Common group

▼ **Group1**

Folder1-1

Folder1-2


Group2

► My passwords

Recent passwords

Group1

Full access

 [Add password](#)

Name	Login	URL
Folder1-1		
Folder1-2		
Test Password	Test username	

Eng Pyc

[info@passwork.me](#)

Primepix & Konfeta





© 2015 Passwork

Terms of service

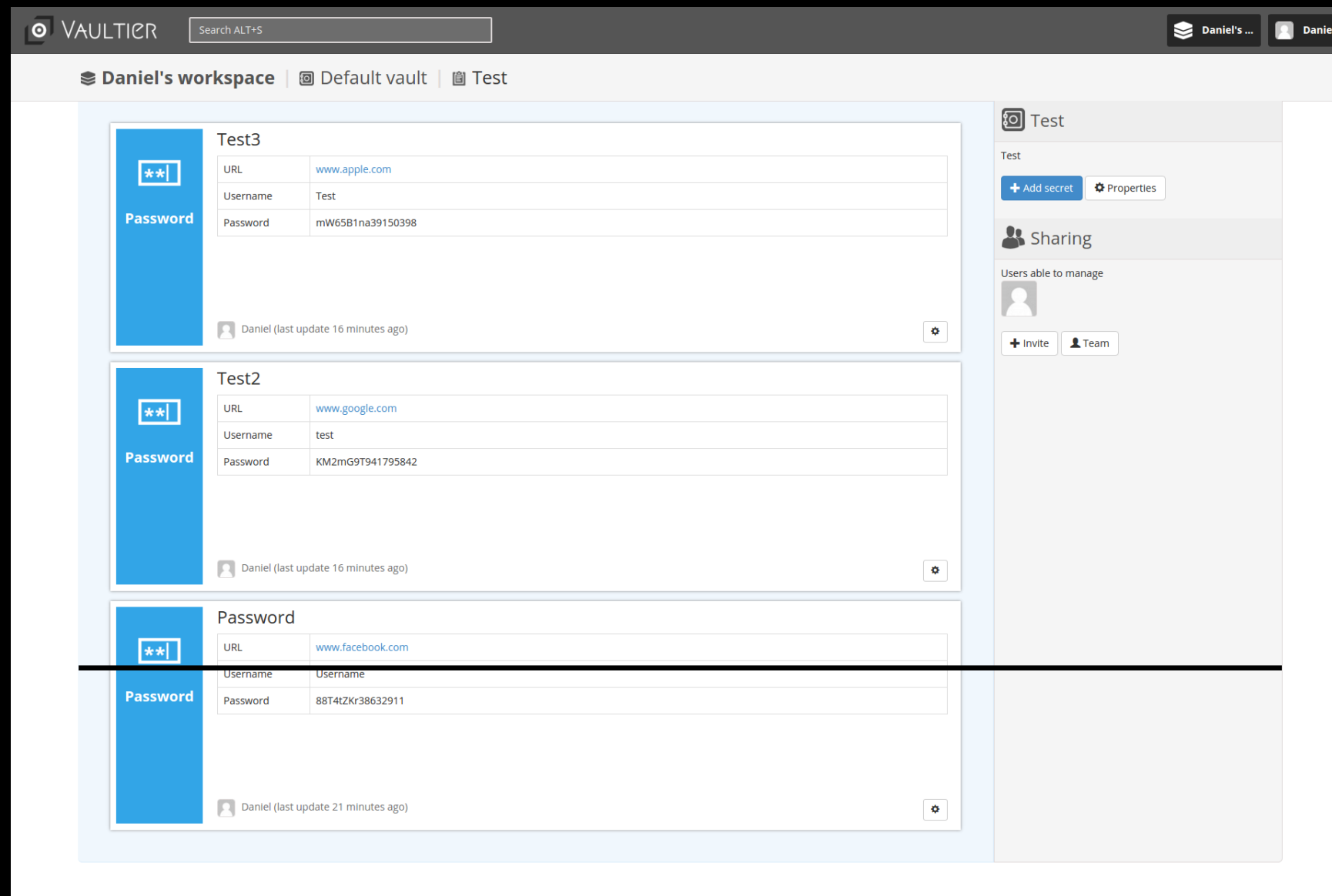
Privacy statement

Leave a message

Tell your friends

# Some have no regards for usability





# Some are WAY to complex

The screenshot displays a password management application interface. At the top, there is a table with four columns: Actions, Title, User Name, and Description. The first row shows a dropdown arrow in the Actions column, the title 'A\_Passw<b>ord1</b>', a lock icon in the User Name column, and the description 'Time to include a description'. The second row, which is highlighted, shows a red upward arrow in the Actions column, the title 'ABPassword7', a lock icon in the User Name column, and the description 'AB Password account7'. A red arrow points from the top-left corner of the image to the red upward arrow in the Actions column of the second row.

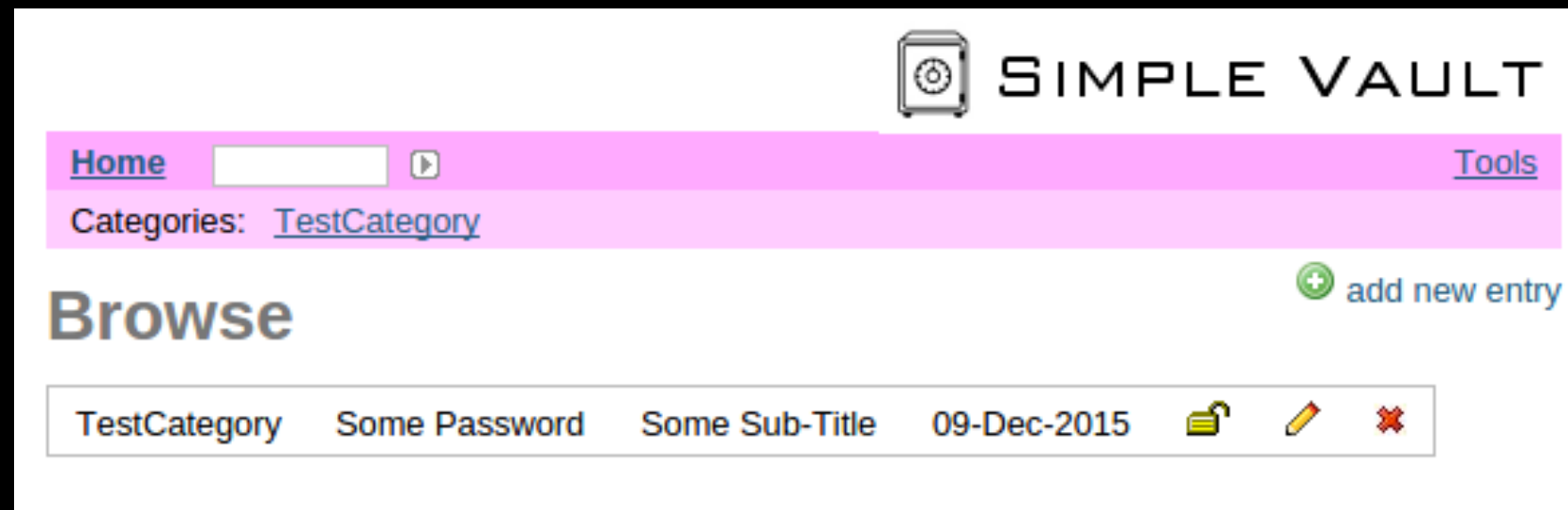
A context menu is open over the 'ABPassword7' entry, listing the following actions:

- Copy or Email Password Permalink
- Copy or Move to Different Password List
- Delete
- Expire Password Now
- Filter Recent Activity on this Record
- Remote Session Launcher with these Credentials
- Send Self Destruct Message
- Toggle Favorite Status
- Validate Passwords Are In Sync
- View & Compare History of Changes
- View Documents
- View Individual Password Permissions
- View Password Reset Tasks

Below the table, there is a section titled 'Recent Activity' with a list of activity logs:

Time	Activity
9/12/2014 4:01:46 PM	Mark Sandford (halox\msand) edited the Password List called
26/11/2014 9:06:21 AM	Mark Sandford (halox\msand) opened the Edit Password screen on this screen. (Title = quicksprout.com, UserName = m.sandford)

# And some are just plain horrible



# Reviewed Academic Solutions

- Tapas: Design, Implementation, and Usability Evaluation of a Password Manager
- Using CardSpace as a Password Manager & Implementing PassCard
  - a CardSpace-based Password Manager
- Stronger Password Authentication Using Browser Extensions
- Sesame: A Secure and Convenient Mobile Solution for Passwords
- All Your Browser-saved Passwords Could Belong to Us: A Security Analysis and a Cloud-based New Design
- Passpet: Convenient Password Management and Phishing Protection
- Cloud Based Manager Using Privacy-Preserved Biometrics
- A Password Manager that Doesn't Remember Passwords
- Password Management Using Doodles
- PALPAS -- PAssword Less PAssword Synchronization
- Cloud-based Storage-Free Browser-based Password Manager
- CredProxy

# And the academics....?

Solution name (or paper name, if no name given)	Reason to dismissal
Tapas	Does not support multiple
CardSpace	Restricted to the Windows
PwDHash	Password derivation tool.
Sesame	Intended for smartphones, tablets, smart watches, and etc.
All your browser-saved	Relies on third party servers.
Passpet	Only works for website logins, in the browser.

# And the academics...?

## Cont.

Solution name (or paper name, if no name given)	Reason to dismissal
Cloud password manager using privacy-preserved biometrics.	Not all devices has biometric inputs.
Versipass	Low amount of permutations and im-practical.
Doodles	Does not support multiple devices
PALPAS	Assumed dependency on third party servers and limited to native applications

# And the academics...? Cont.

Solution name (or paper name, if no name given)	Reason to dismissal
Toward a secure and usable cloud-based password manager for web	Only works for website logins, in the browser.
CredProxy	Ambiguity in implementation details, no support for multiple

# Summing up the academics

- None of them suggest a “full” solution
  - Either there is no multi-device support
  - Or..
  - They solve it by uploading it to a server the user does not control
- Highly platform dependant solutions

So unfortunately....

.... None of them fit the bill



# So... What then?

- We need something new
- Something better
- Something that actually fulfills the requirements