

puavo.org

Managing Linux desktops in large-scale (in Finnish schools)

Juha Erkkilä

Opinsys

Juha Erkkilä (that's me!)

- free software hobbyist since 1999
- working at Opinsys since 2008 to develop and deploy Linux desktops in Finnish schools

Opinsys

- a Finnish company founded in 2003, providing IT solutions to schools
- employs about 15 people
- maintaining 5000+ active desktop/laptop Linux computers in primary and secondary schools
- managing a lot more user accounts



First steps: 2003-2012 the LTSP era

- school marketplace dominated by Microsoft Windows
- provide a cheap and easy to maintain alternative:
 - setup and maintain LTSP (Linux Terminal Server Project) in Finnish schools
 - providing Ubuntu, Gnome, Firefox, Openoffice, etc.

Times have changed in ten years

- Apple (with iPads) and Google (with Chromebooks and services) are competing with Microsoft
- thin clients are out, remote X not good enough for modern use
- goodbye LTSP, our current devices are mostly laptops and "fatclients" (diskless workstations with shared \$HOME)

Transition to Debian during 2015-2019

- switched from Ubuntu to Debian due to licensing concerns
- Canonical changed their IP policy in 2015:
 - <https://ubuntu.com/legal/intellectual-property-policy>
 - "You can redistribute Ubuntu, but only where there has been no modification to it."

What is Puavo? (puavo.org)

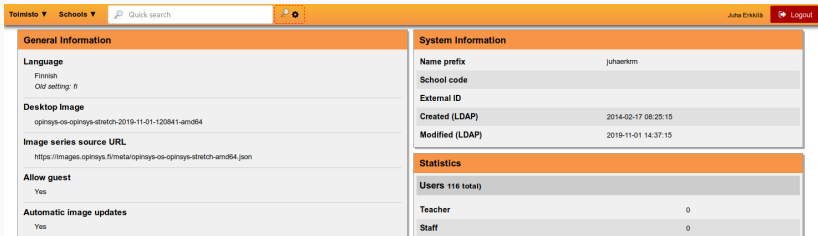
- Puavo is the system we develop to service our customers
- Puavo Web is web software for user and device management
- Puavo OS is an operating system that is built from Debian GNU/Linux and is specifically designed for learning
- free software (GPLv2+) since 2010
- not community developed, we just code publicly what we use ourselves

Puavo goals

- provide a good system for education
- be maintainable by a few admins yet scalable to large environments
- support computers as long as is reasonable (10+ years) for economic and environmental reasons
- be reasonably secure
- do not depend on technologies by Google, Apple, Microsoft, . . .
- provide system administration code as open source to build systems used in the real world

Puavo Web (managing devices/users)

- Ruby on Rails application
- uses OpenLDAP (a separate database for each organisation, supporting 100+ organisations)
- uses MIT Kerberos, providing single sign-on
- keep a read-only copy in school servers



The screenshot displays the Puavo Web interface. At the top, there is a navigation bar with 'Toimisto' and 'Schools' dropdown menus, a search bar labeled 'Quick search', and user information 'Aino Erkkila' with a 'Logout' button. The main content area is divided into two columns. The left column, titled 'General Information', contains sections for 'Language' (Finnish, Old setting: fi), 'Desktop Image' (opinsys-os-opinsys-stretch-2019-11-01-120841-amd64), 'Image series source URL' (https://images.opinsys.fi/meta/opinsys-os-opinsys-stretch-amd64.json), 'Allow guest' (Yes), and 'Automatic image updates' (Yes). The right column, titled 'System Information', contains sections for 'Name prefix' (juhaerkm), 'School code', 'External ID', 'Created (LDAP)' (2014-02-17 08:25:15), 'Modified (LDAP)' (2019-11-01 14:37:15), 'Statistics' (Users 116 total), 'Teacher' (0), and 'Staff' (0).

General Information	
Language	Finnish Old setting: fi
Desktop Image	opinsys-os-opinsys-stretch-2019-11-01-120841-amd64
Image series source URL	https://images.opinsys.fi/meta/opinsys-os-opinsys-stretch-amd64.json
Allow guest	Yes
Automatic image updates	Yes

System Information	
Name prefix	juhaerkm
School code	
External ID	
Created (LDAP)	2014-02-17 08:25:15
Modified (LDAP)	2019-11-01 14:37:15
Statistics	
Users 116 total)	
Teacher	0
Staff	0

Puavo Web (user management)

- has organisations, schools, groups, users, etc.
- admins and teachers can have special permissions to add/modify/remove users/devices (for example to manage passwords)
- user accounts can be used by external applications through LDAP
- can use external user databases as a source for user information

Puavo Web (device management)

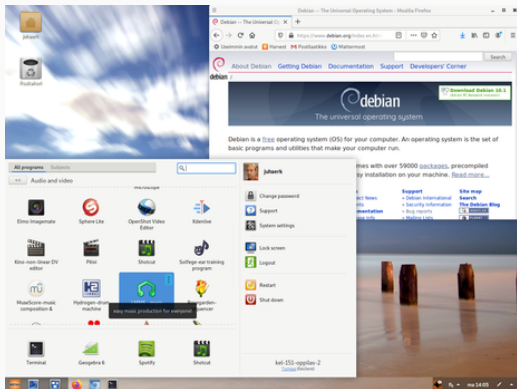
- a database of devices in each school
- can manage Puavo OS hosts and their functionality
- also gathers a bit of information on how they are used

Puavo OS

- currently based on Debian Stretch (Buster almost ready for production)
- was based on LTSP but has diverged and no longer has LTSP as a dependency (most important reason: laptops are our primary target)
- distributed as a read-only disk image that is updated atomically without any disruption for users

Puavo OS Desktop

- just Gnome 3 tweaked to behave more like Windows
- has most of the best things the free software world has to offer for schools



Other Puavo OS features

- multiple system modes: hosts can function as bootservers, laptops, diskless workstations, digital signage screens, webkiosks, . . .
- automatic poweroff when idle during non-school hours
- guest logins
- many other features . . .

Google — a friend or an enemy?

- schools need environments for collaboration
- in practice our system tends to get paired with Google Apps For Education
- have we become a thin client provider for proprietary Google services? (Google Chrome our most used app)
- "medium is the message" – do we teach that privacy does not matter?

Future plans

- maybe there is a privacy-conscious school market out there? — provide an alternative to GAFE and integrate with Nextcloud, Collabora Office, ...?
- better documentation
- fix issues so that everything works more "out of the box"
- "read-only system image" is good but not perfect, maybe something like NixOS? (in a very long term)

Thus.... if you want to deploy Linux desktops/laptops in schools (and more than only a few), this might be for you.

(there are also a few schools using our technology in Switzerland and Germany)

**A quick note in which other way
Linux is present in Finnish
schools . . .**

(not related to Puavo)

**In the final year of upper
secondary school there are
"final examinations" that have
been digital for some years now.**

DigabiOS

This system is called DigabiOS and based Debian (the examination software itself is proprietary).



- for the examination, students must provide their own laptops, booting Linux from usb drives
- a strong incentive for high school students to buy Linux-compatible hardware
- "final examination compatible" computers are marked as such in many computer stores

Thank you! Questions?

puavo.org —

github.com/puavo-org