SavaPage

Open Print Portal

by Rijk Ravestein, Lead Developer

rijkr@savapage.org

Saturday • January 18 • 2020

Rijk Ravestein

Utrecht University

1980

Cognitive Psychology

1985

Software Engineer

VOLMAC IBM

Capgemini CMG

1998

www.datraverse.nl

SavaPage
Open Print Portal

2011

www.savapage.org

LibrePractice
A Business Model for Free Software Practitioners

www.librepractice.org

Datraverse
A Libre Software Practice

www.datraverse.com

Agenda

- Print Management
  - What, Why, How?
- Issues . . .
- Libre Print Management
  - Why SavaPage?
  - How does it work?
- demo.savapage.org . . .
- SavaPage Community
- Questions . . .

What is Print Management ?

- Tracking & Tracing

- Monitoring and control

- Pay-per-Print

€ 0.05

- Secure Pull-Printing

- Copy control

Why Print Management ?

In most cases Document Output
is the 3rd Highest Office Expense
Behind Payroll and Rent

Why Print Management ?

Who provides the hardware ?

RICOH

nashuatec

xerox

Canon

LEXMARK™

KONICA MINOLTA

SHARP

TOSHIBA

KYOCERA

hp

SAMSUNG

Example: Xerox-D95A-D110-D125

1. 2-Tray Oversized High-Capacity Feeder*
2. 250-sheet bypass tray
3. Scanner (up to 200 ipm) with standard color scanning
4. Print resolution up to 2400 x 2400 dpi
5. 1,100-sheet letter-size tray
6. 1,600-sheet letter-size tray
7. 2x550-sheet trays standard and custom sizes up to 13 x 19.2 in.
8. Interface module
9. GBC® AdvancedPunch™*
10. High-Capacity Stacker*
11. Optional folder C-fold, Z-fold, Engineering Z-fold
12. 200-sheet standard post process inserter
13. Booklet Maker Finisher
    Hole punch
    500-sheet top tray
14. Xerox® SquareFold® Trimmer Module

Who provides Print Management?

KOFAX equitrac

EVERYONE PRINT

PHAROS Uniprint®

P COUNTER EUROPE

KOFAX Nuance® SafeCom™

Gespage

ezeep

Canon uniFLOW

PaperCut

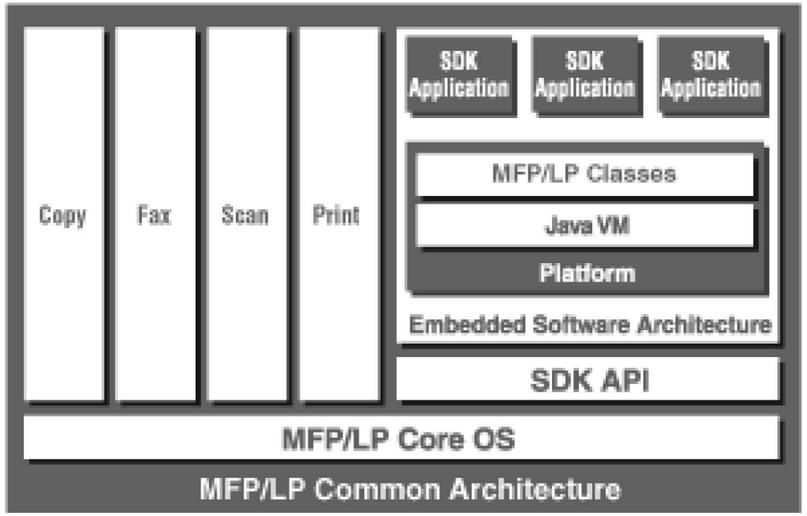
Trends & Buzzwords

- Print Management in the Cloud
  - ~~Google Cloud Print~~
    - Others will fill the gap.
- BYOD
  - Mobile Print
  - Driverless Printing
    - AirPrint
    - IPP Everywhere
- On Device Apps?
  - Xerox App Gallery

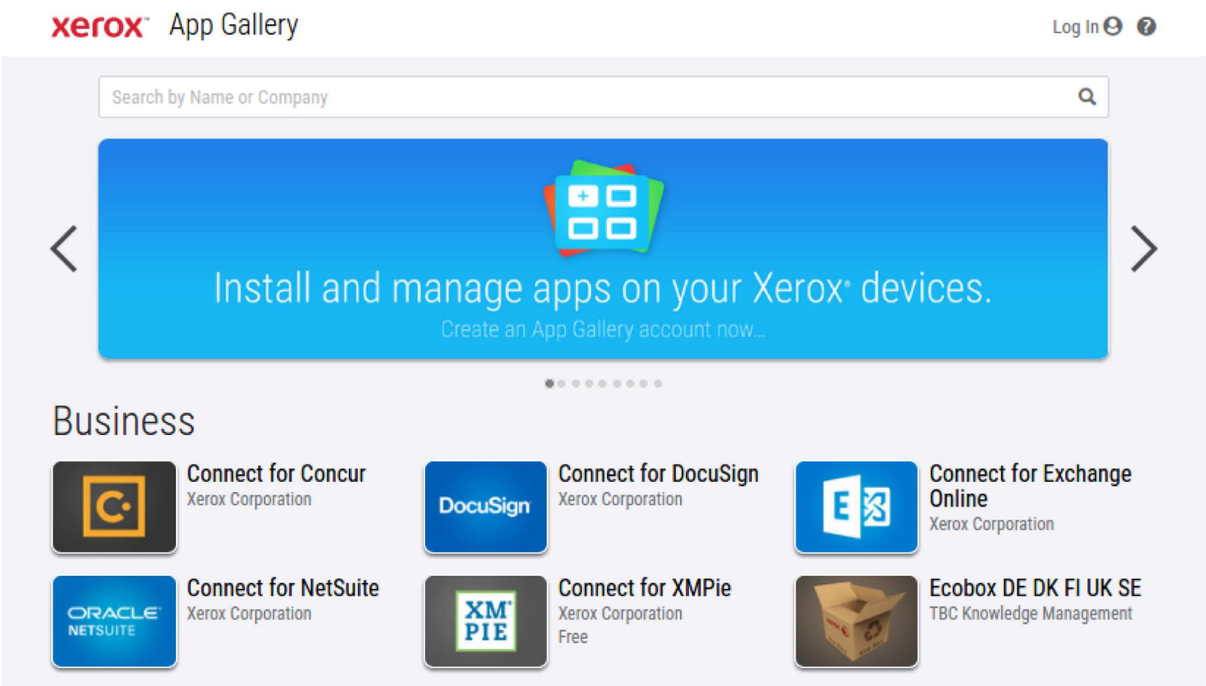
Print Management Issues

- Proprietary Devices
  - Multi-Functionals and Copiers
  - Peripherals

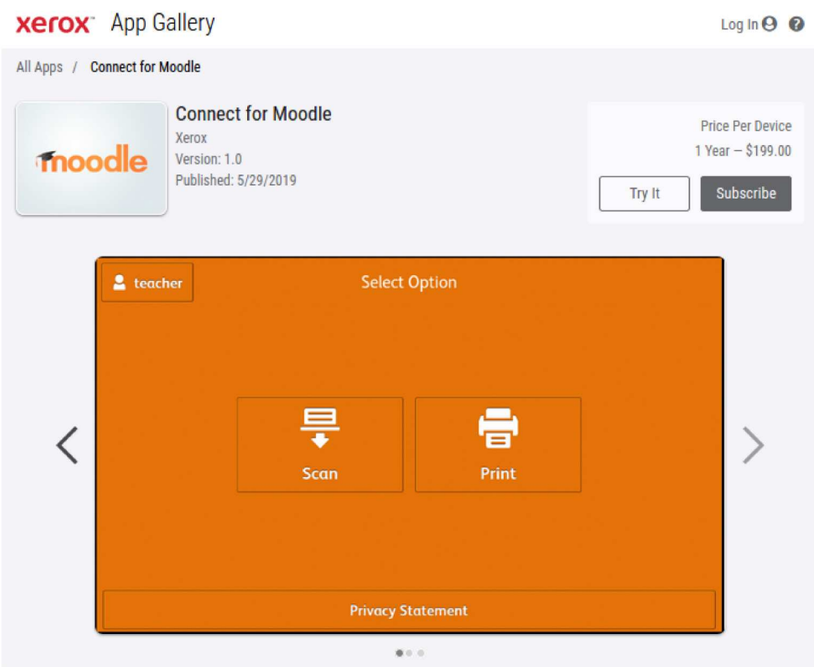
- Closed Software
  - Embedded on SDK
  - Certification Programs
    - €€€€€



"You shall not use Open Source Software"



https://appgallery.services.xerox.com



XEROX SDK LICENSE AGREEMENT

https://www.xerox-solutions.net/developers/application.php

6. You shall not use Open Source Software including without limitation software licensed under the GNU General Public License ("GPL"), the Mozilla Public License ("MPL") or the IBM Public License ("IPL"), in connection with Applications if such use may: (i) create, or purport to create, obligations of Xerox with respect to the SDK; (ii) grant, or purport to grant, to any third party any rights to, waivers of or immunities under Xerox' intellectual property or proprietary rights; and/or (iii) cause, or be interpreted or asserted to cause, the SDK in whole or in part or any modifications or enhancements to the SDK to become subject to the terms of the GPL, MPL or IPL or other Open Source Software license.

Think . . . Before You Print

WIRED BUSINESS CULTURE GEAR IDEAS SCIENCE SECURITY TRANSPORTATION SIGN IN SUBSCRIBE

We Need Software to Help Us Slow Down, Not Speed Up

Speed often improves life. But the recent techlash has been driven in a fundamental way by the grim side effects of this acceleration.

ZOHAR LAZAR

Enter SavaPage . . .

SavaPage is a Free Print Portal Solution that uses Open Standards and Commodity Hardware for Secure Pull-Printing, Pay-Per-Print, Delegated Print, Job Ticketing, Auditing and PDF Creation.

SavaPage is OSI Certified Open Source Software: you can redistribute it and/or modify it under the terms of the GNU Affero General Public License (AGPL) as published by the Free Software Foundation, either version 3 of the License, or (at your option) any later version.

Welcome

Welcome to SavaPage! Our community unites people who are interested in Open Printing in general and SavaPage Open Print Portal in particular. The mission and vision of our journey is as follows:

`Mission`	Produce Open Printing Solutions with Free and Open Source Software.
`Vision`	A World where People & Planet enjoy a sustainable Open Printing Experience.

You are cordially invited to sign up to our Community Forum. If you installed SavaPage Open Print Portal as part of your printing solution, you are invited to subscribe to our software as Community Resident.

What about openprinting.org ?

Printer Database

OpenPrinting's Printer Database

Browse

Printer Driver Database

OpenPrinting's Printer Driver Database

Browse

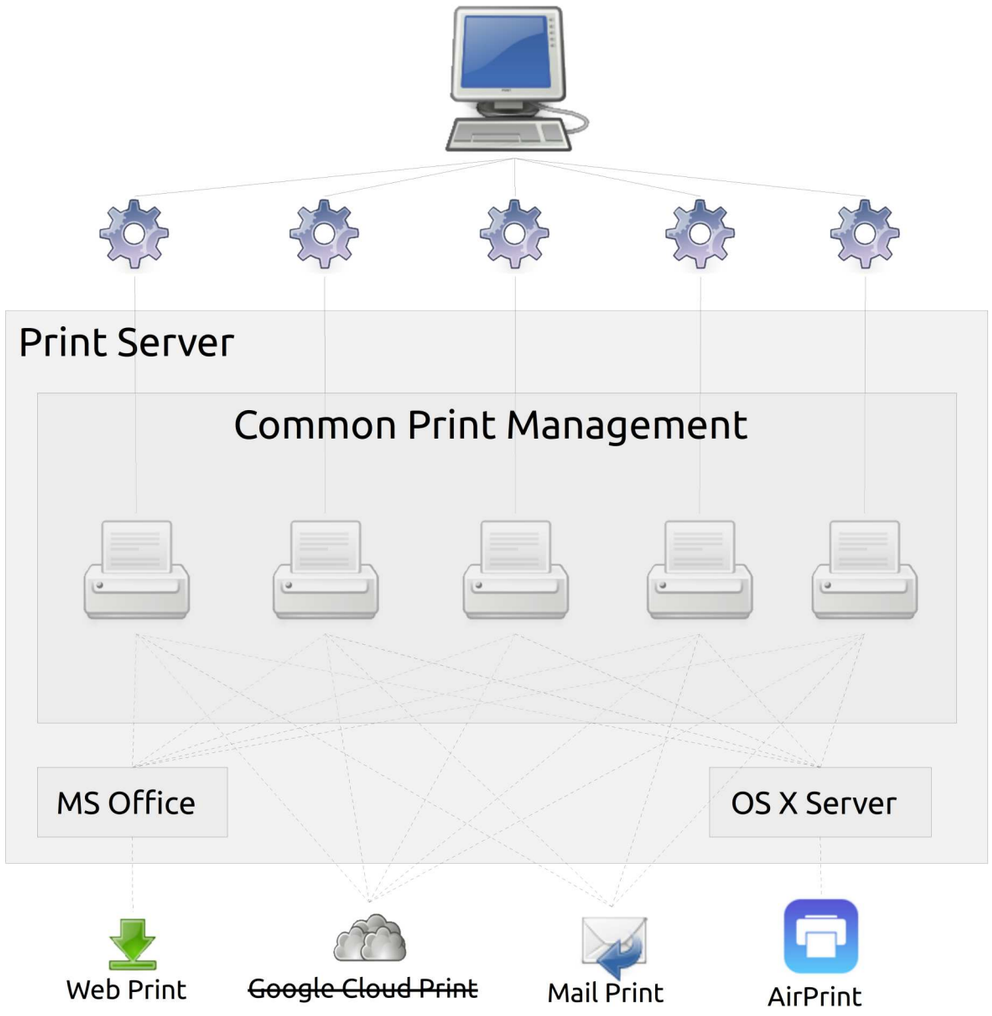
- works on the development of new printing architectures, technologies, printing infrastructure, and interface standards for Linux and UNIX-style operating systems.
- collaborates with IEEE-ISTO Printer Working Group (PWG) on IPP projects.
- is working with SANE to make IPP scanning a reality.
- maintains cups-filters which allows CUPS to be used on any Unix-based (non-macOS) system.
- is responsible for the Foomatic database.
- is working on Common Print Dialog Backends project.

What is SavaPage ?

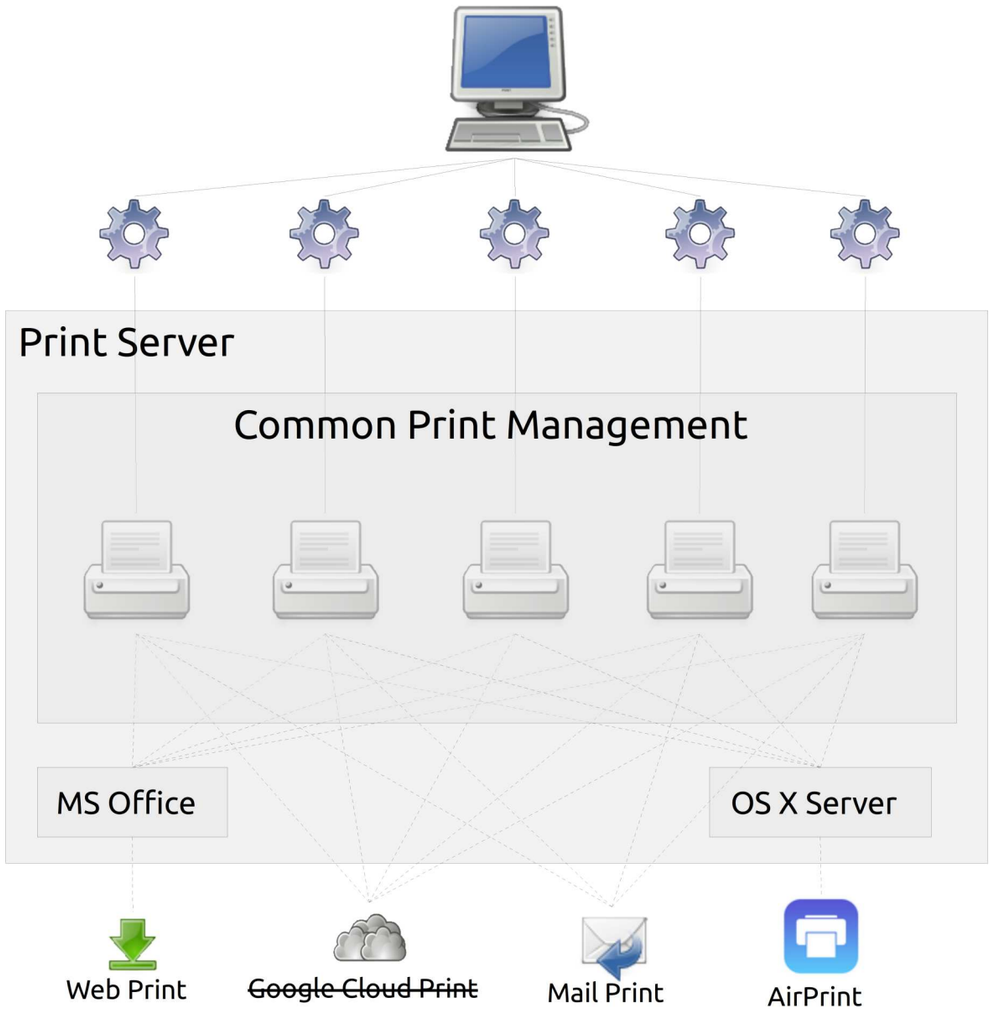
- Common features
  - Tracking & Tracing, Pay-Per-Print, Secure Pull-Printing
  - Driver Print, Web Print, Mail Print, Android, AirPrint, ~~Google Cloud Print~~
  - Job Ticketing, Document Archiving, Printer SNMP, GDPR compliant
  - LDAP, Active Directory, NFC, Internationalization, and more . . .
- Unique features
  - Delegated Print, PDF/PGP Verification, PGP/MIME
  - Plug-ins: OAuth, Payment, Notifications, IPP Routing
  - Corporate Virtual Printer + PDF Creator
  - GNU/Linux, AGPL, Open Standards, Commodity Hardware
  - Supports all Client Platforms & Mobile Devices

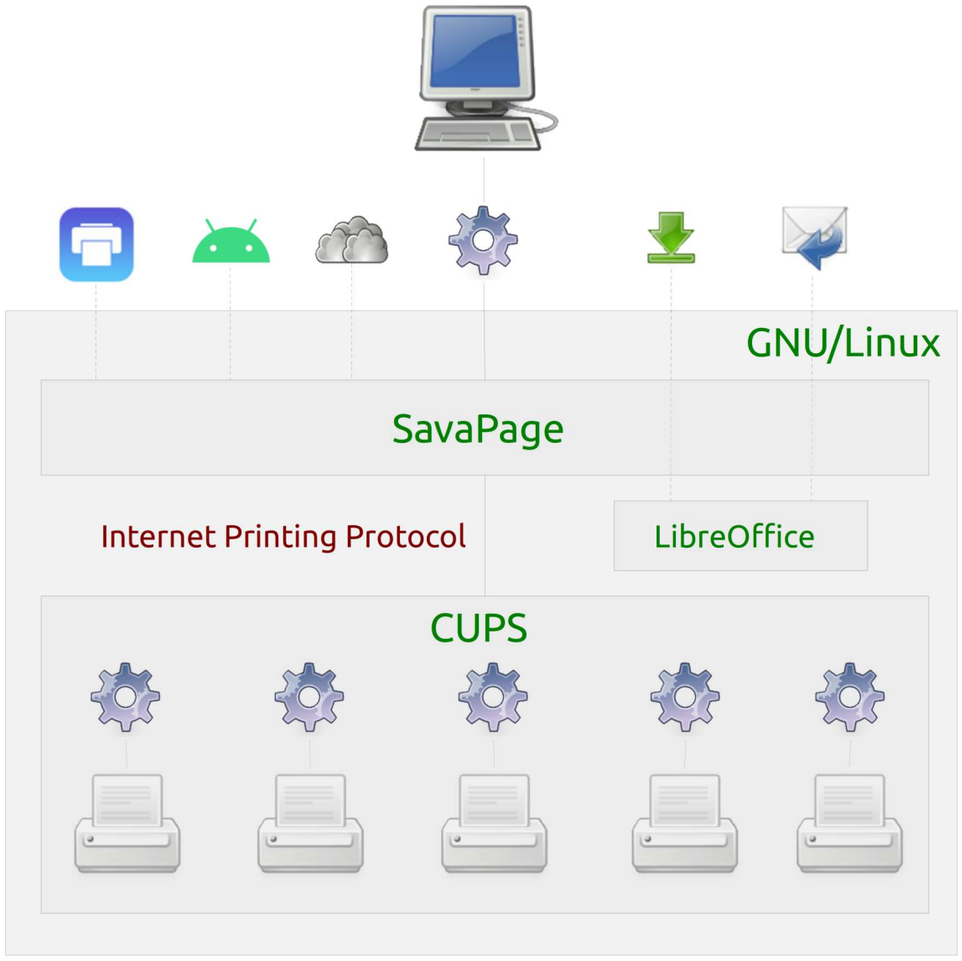
And yes, you can use it @home

How does SavaPage work?

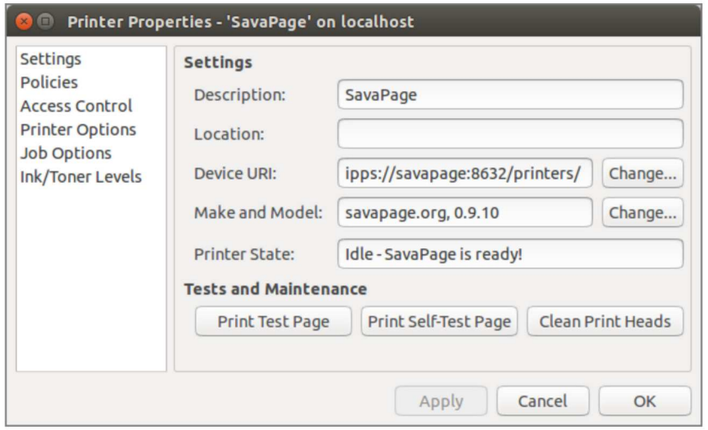


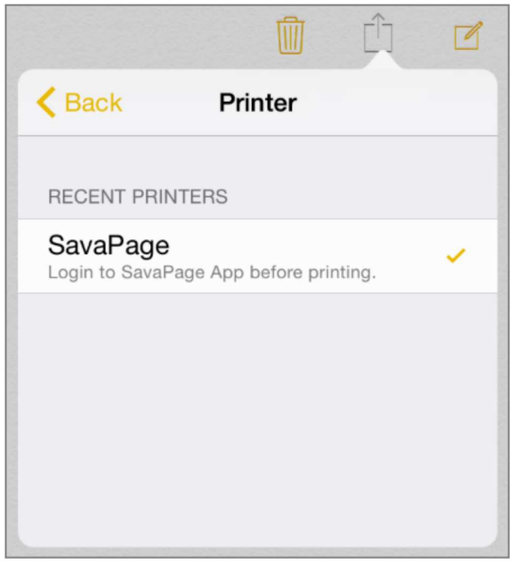
How does SavaPage work?

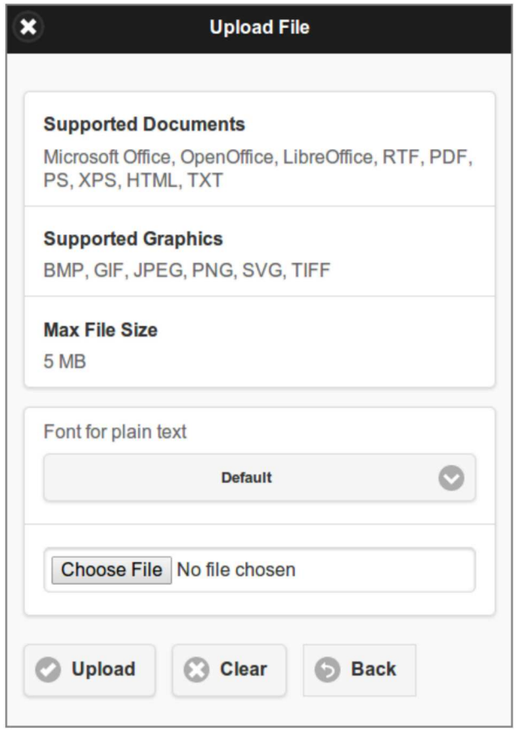


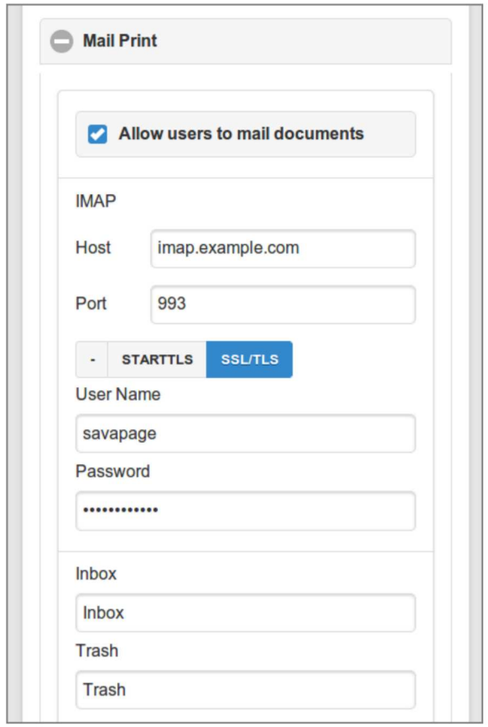


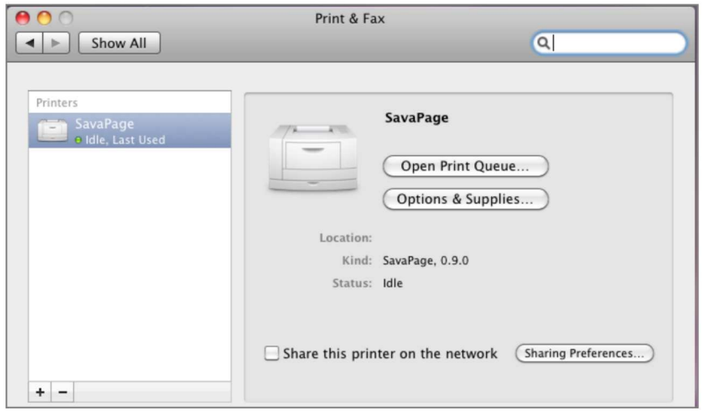
Step 1: Print


Printer Properties - 'SavaPage' on localhost
Settings
Policies
Access Control
Printer Options
Job Options
Ink/Toner Levels
Settings
Description: SavaPage
Location:
Device URI: ipps://savapage:8632/printers/ Change...
Make and Model: savapage.org, 0.9.10 Change...
Printer State: Idle - SavaPage is ready!
Tests and Maintenance
Print Test Page
Print Self-Test Page
Clean Print Heads
Apply
Cancel
OK


Back
Printer
RECENT PRINTERS
SavaPage
Login to SavaPage App before printing.

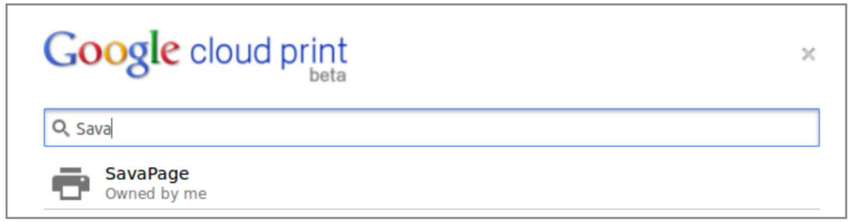

Upload File
Supported Documents
Microsoft Office, OpenOffice, LibreOffice, RTF, PDF, PS, XPS, HTML, TXT
Supported Graphics
BMP, GIF, JPEG, PNG, SVG, TIFF
Max File Size
5 MB
Font for plain text
Default
Choose File No file chosen
Upload
Clear
Back


Mail Print
Allow users to mail documents
IMAP
Host imap.example.com
Port 993
STARTTLS
SSL/TLS
User Name
savapage
Password
Inbox
Inbox
Trash
Trash


Print & Fax
Show All
Printers
SavaPage
Idle, Last Used
SavaPage
Open Print Queue...
Options & Supplies...
Location:
Kind: SavaPage, 0.9.0
Status: Idle
Share this printer on the network
Sharing Preferences...

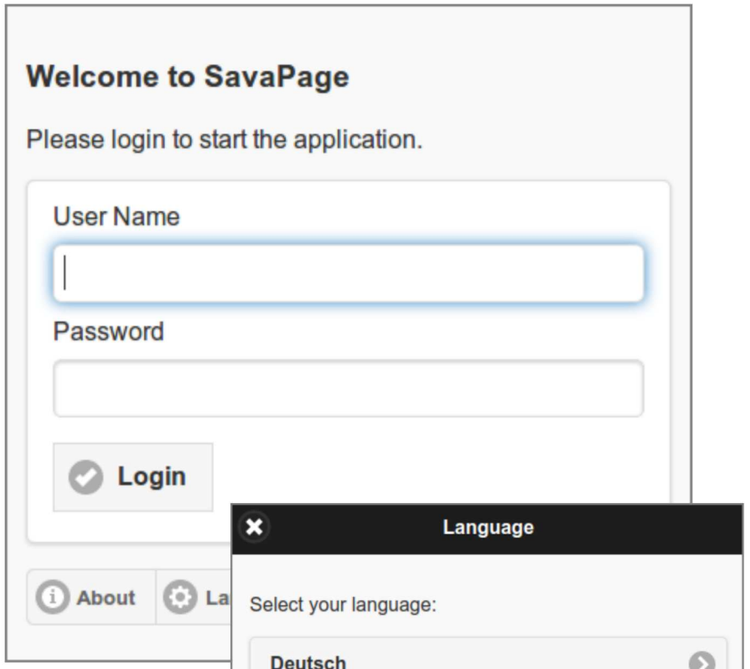
SavaPage

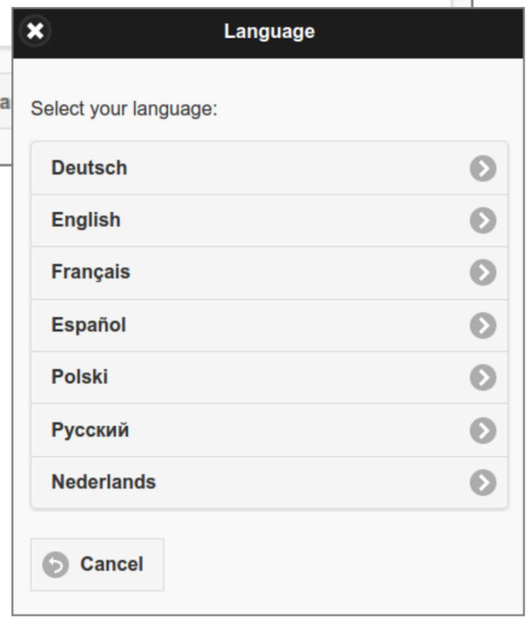
Internet Printer
Use this URL to print over public internet:
ipps://example.com/printers/internet/user/1111/uuid/0e655217-b25b-4dd2-9fad-21720ebf3d69
Back

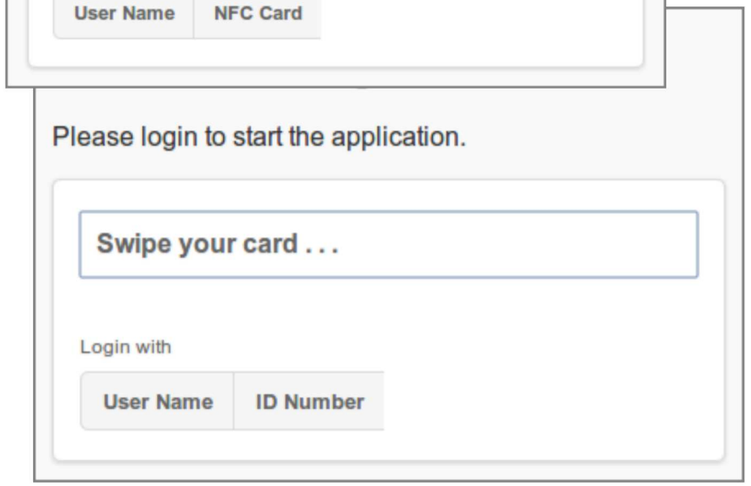

Google cloud print
beta
Sava
SavaPage
Owned by me

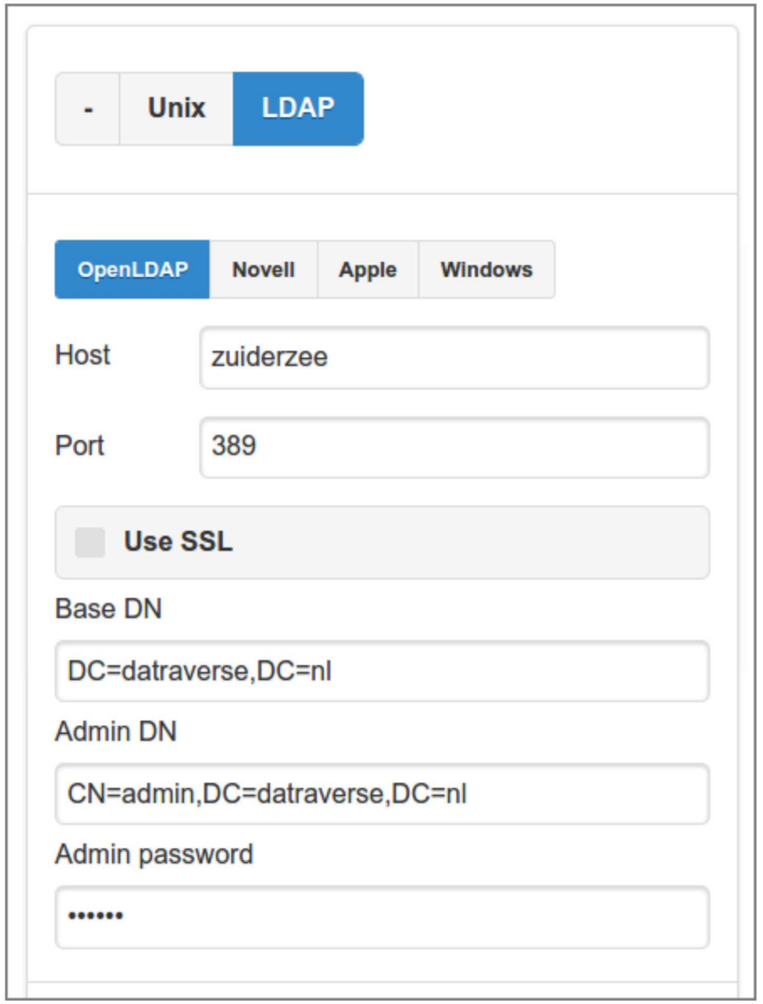
Step 1: Print (Android)

Step 2: Login Web App

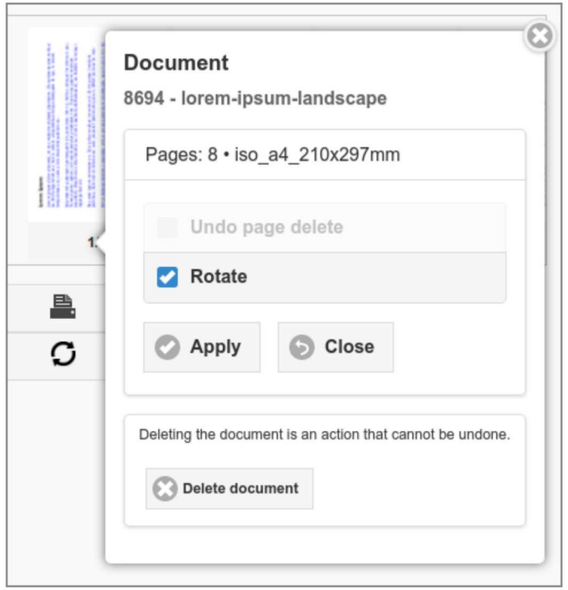


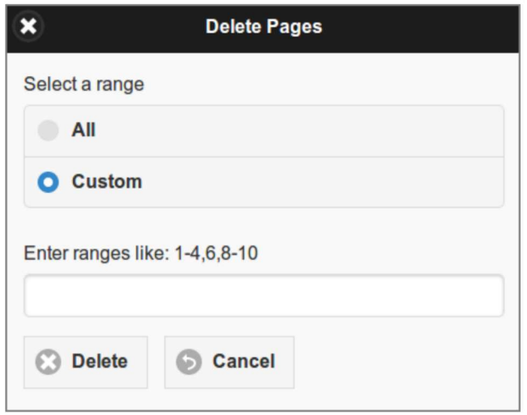


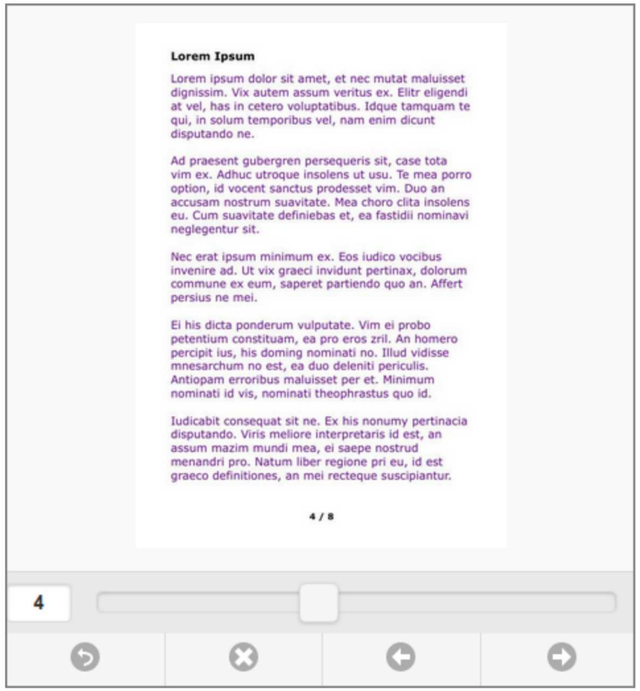




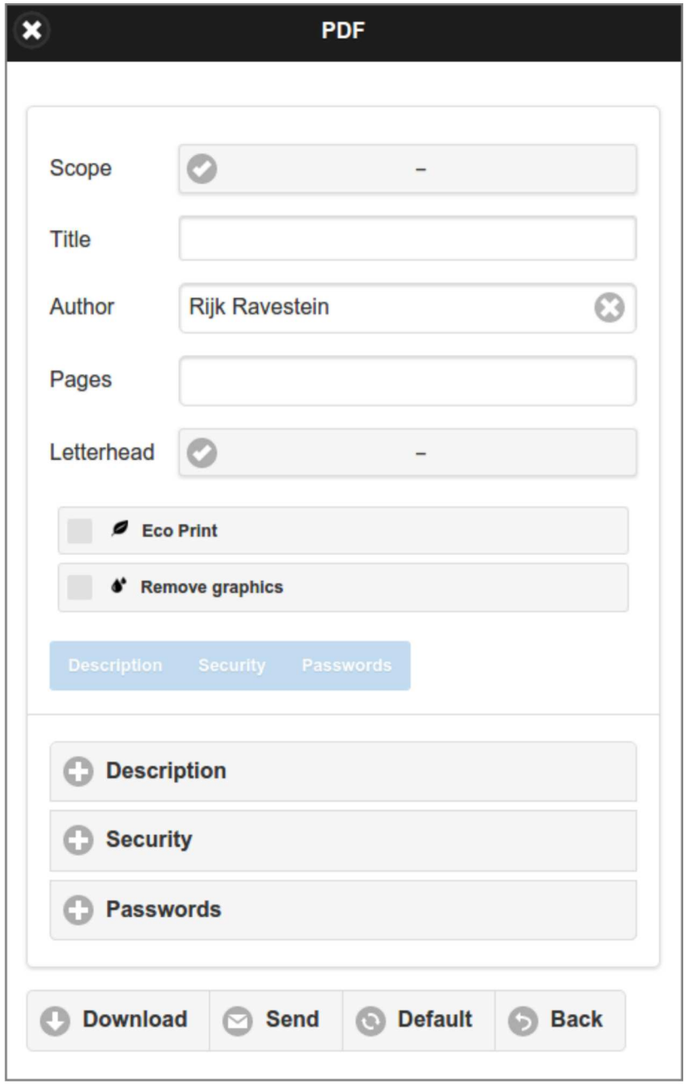
Step 3: Preview, edit . . .

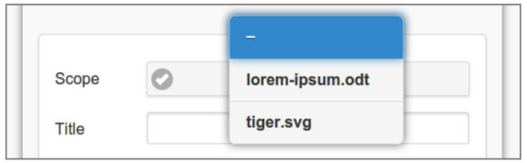


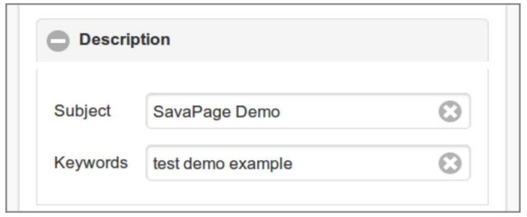


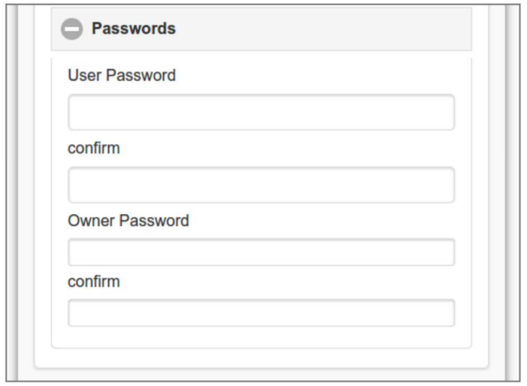


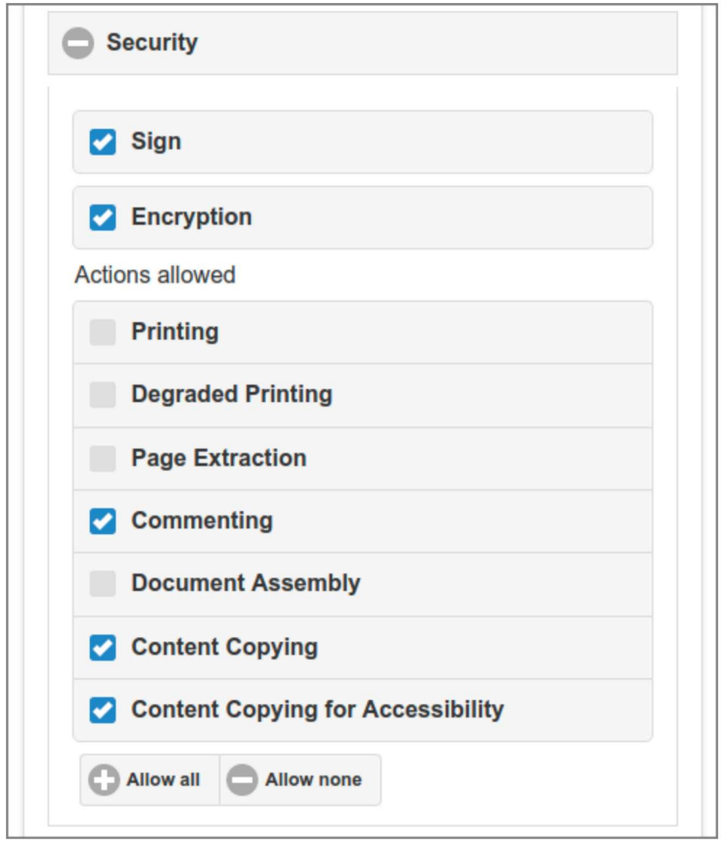
Step 4a: Save as PDF



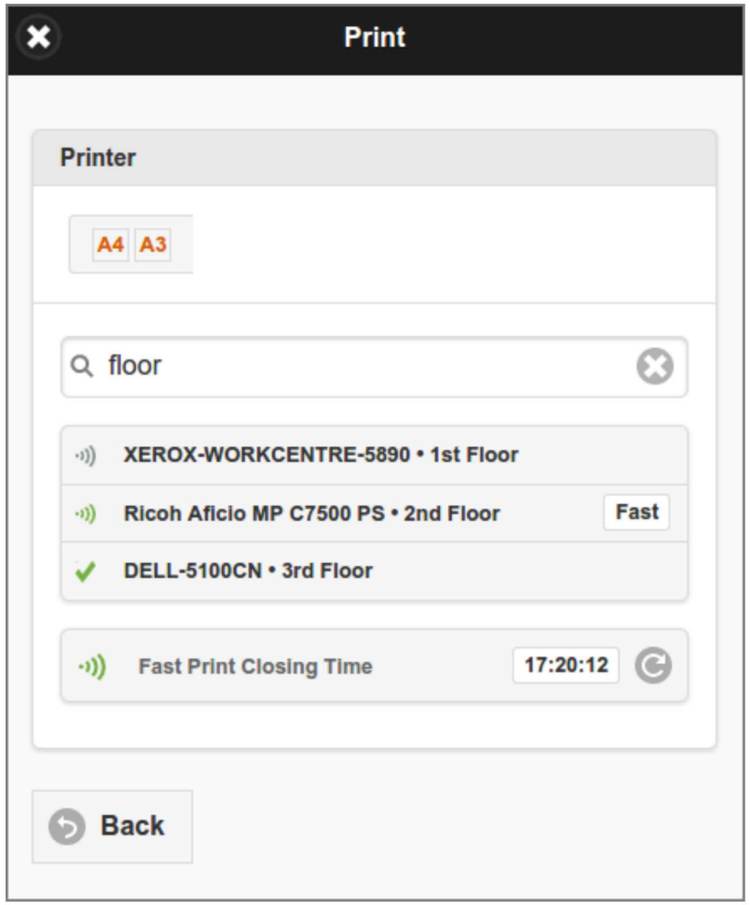


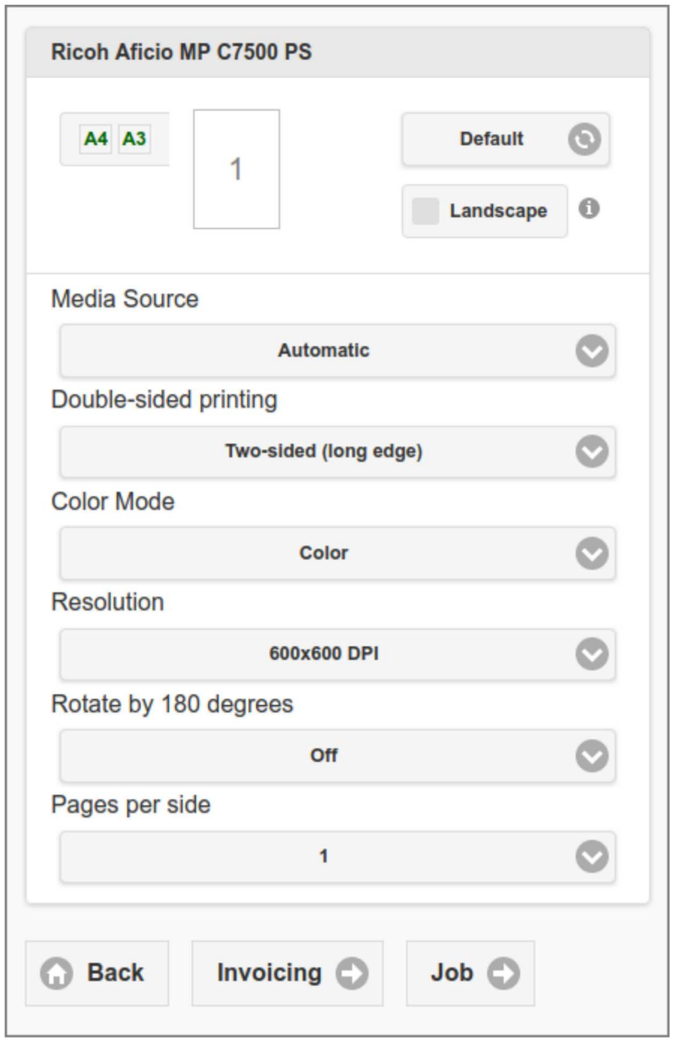


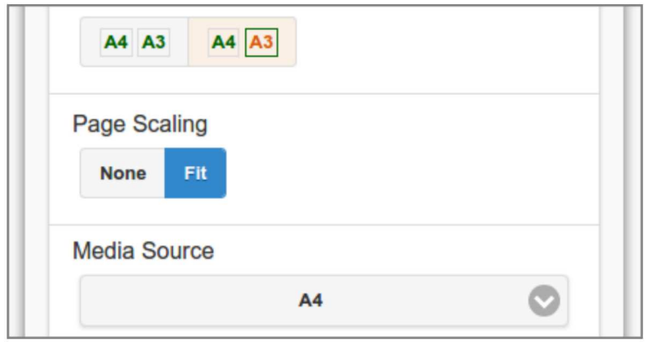




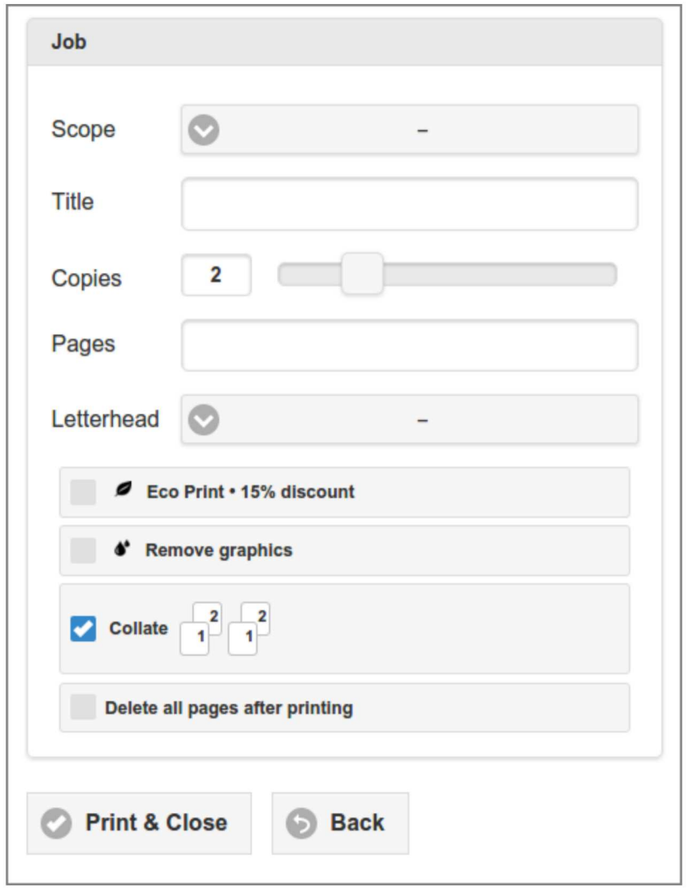
Step 4b: Proxy Print

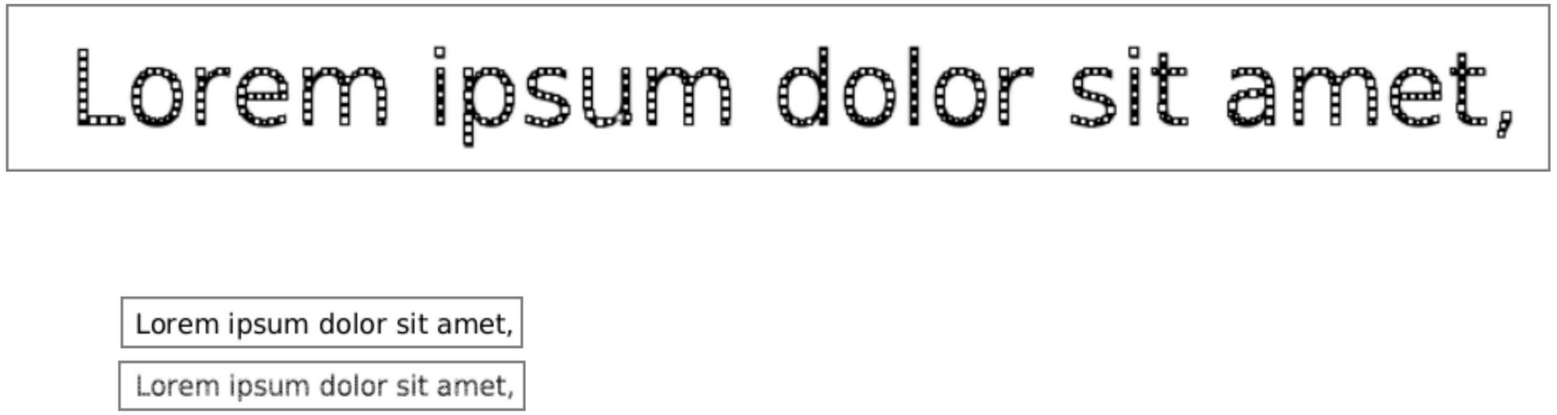




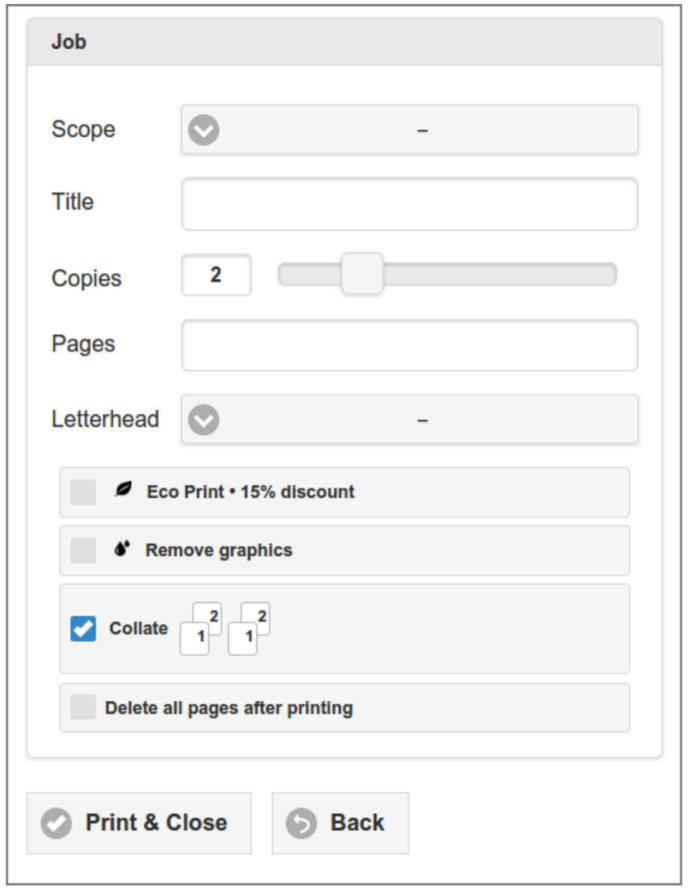


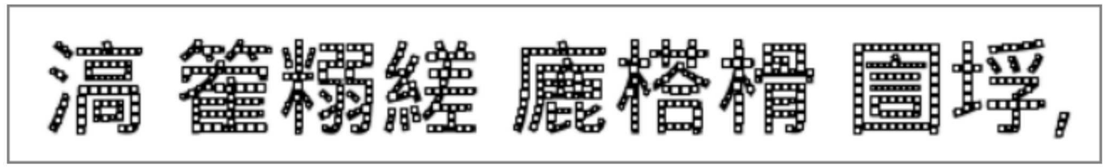
Step 4b: Eco Print (1)

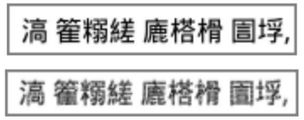




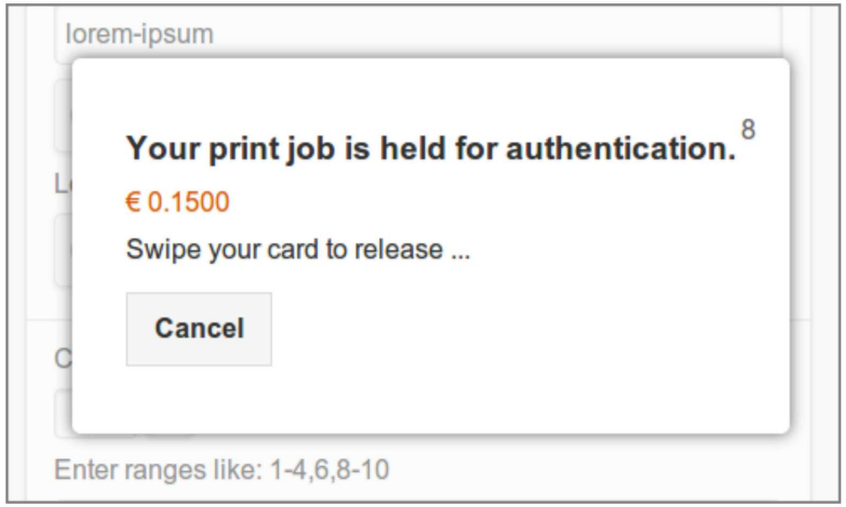
Step 4b: Eco Print (2)

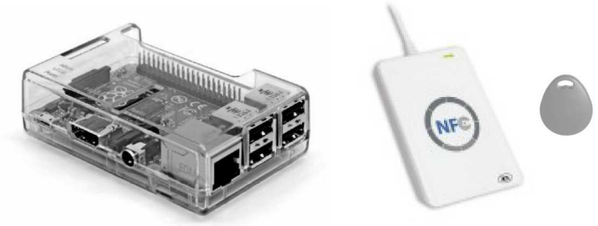


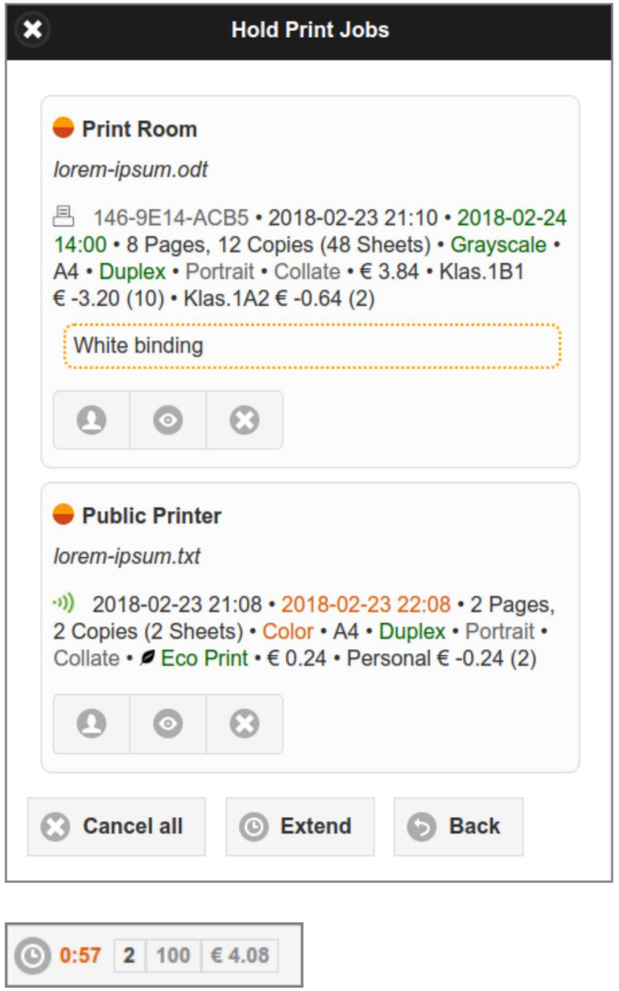


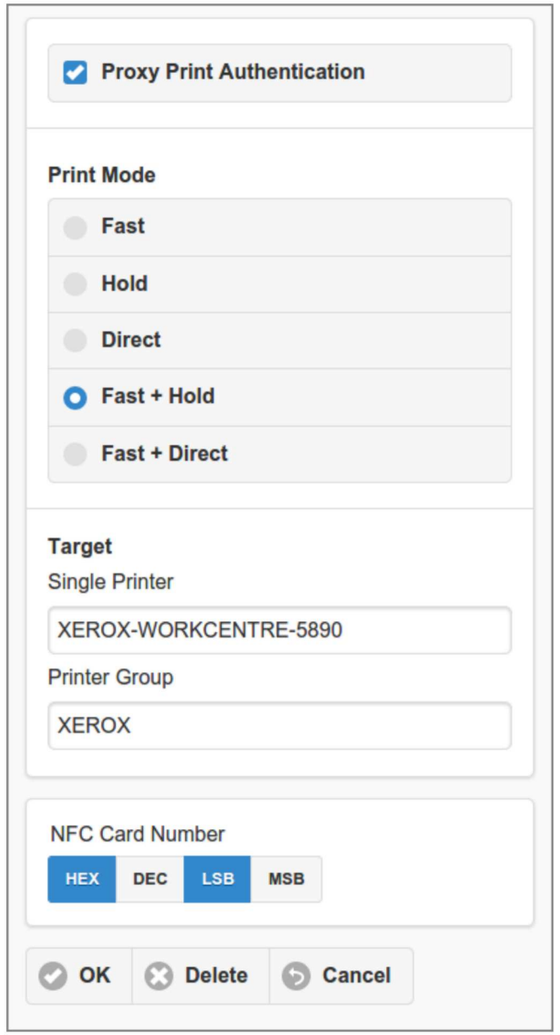


Step 5: Print Release









Step 6: Recharge account

Point of Sale

Deposit | Receipts

Enter the username and select an amount to add to the account.

User ID: rijk

Amount: € 5 . 00 — Balance €15.00

Payment method: Credit Card

Comment: VISA card

Receipt: - rijkr@datraverse.nl

Deposit | Clear | Back

Manual transaction • D000022 — 4/23/14 3:26 PM, rijk

€20.00 • €5.00 • Credit Card

VISA card

Receipt

Pre-Paid Print Card

EUR 5.00

A-1503-0797-8523-0567-9607

Use before December 31, 2015

Issued by Datraverse B.V.

Redeem Voucher

All requests to redeem vouchers are logged.

Number: A-1503-0797-8523-0567-9607

Redeem | Back

Redeem Voucher — 9/8/15 1:23 PM, rijk

EUR 6.41 • EUR 5.00

Redeemed voucher "A-1503-0797-8523-0567-9607".

Financial

Balance	EUR 4.55
Credit limit	EUR 10.00

Voucher | Transfer

Use an external account to increment your balance:

Transfer Money

Transfer money from ideal.
Minimum amount EUR 0.55
EUR 0.45 cost is charged to your account.

EUR 5 . 00

Start | Back

ideal — 6/2/15 4:30 PM, [system]

EUR 60.25 • EUR 4.55 • TESTNL99
NL17RABO0213698412 • tr_fBkJAKmqrR

SavaPage tegoed voor rijk.

• EUR 5.00 -/- 0.45 • T. TEST

Bitcoin

To pay with Bitcoin please send to:

9FgdrqYW7fsdd5UWrGIpJi2KcnMoJ8aVgF

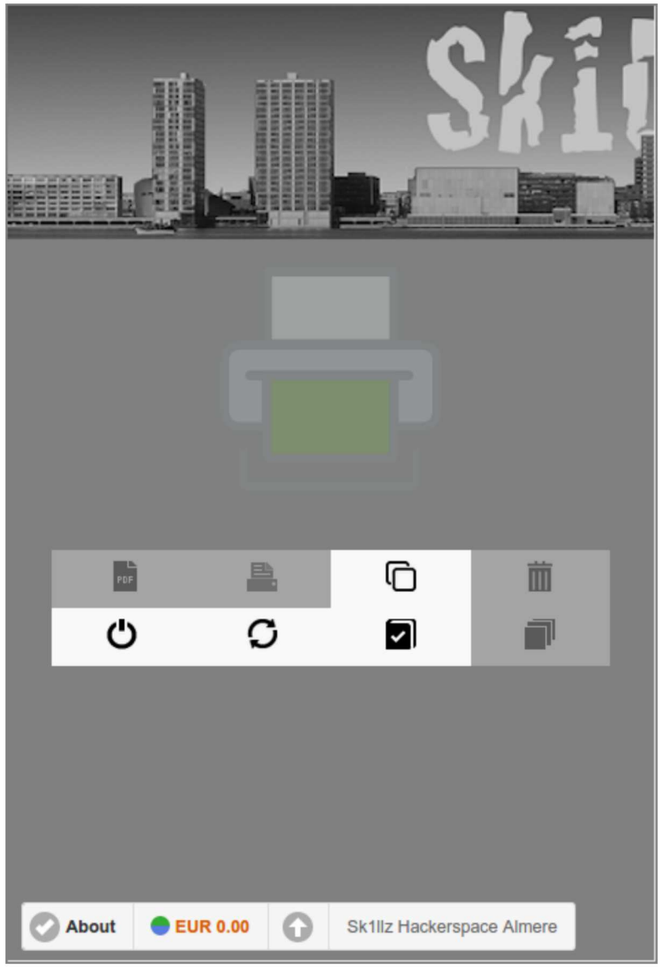
This address is for one-time use. A second payment at this address is not accepted.

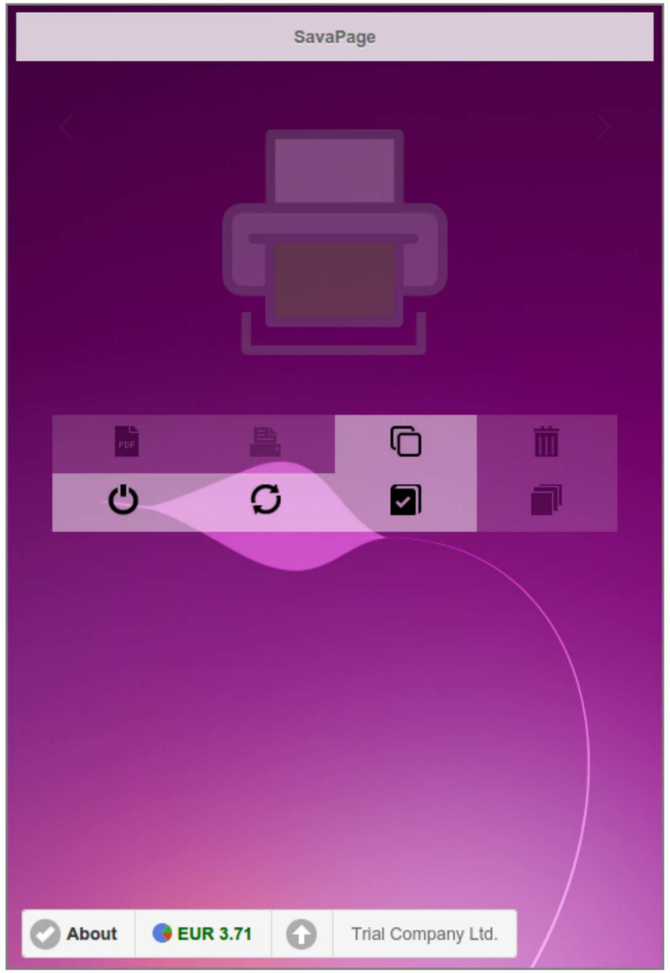
Start | Back

bitcoin — 6/15/15 4:57 PM, [system]

EUR 4.86 • EUR 0.83 • 96212...82710 • ฿ 0.00400000

Customize


About
EUR 0.00
Sk1llz Hackerspace Almere

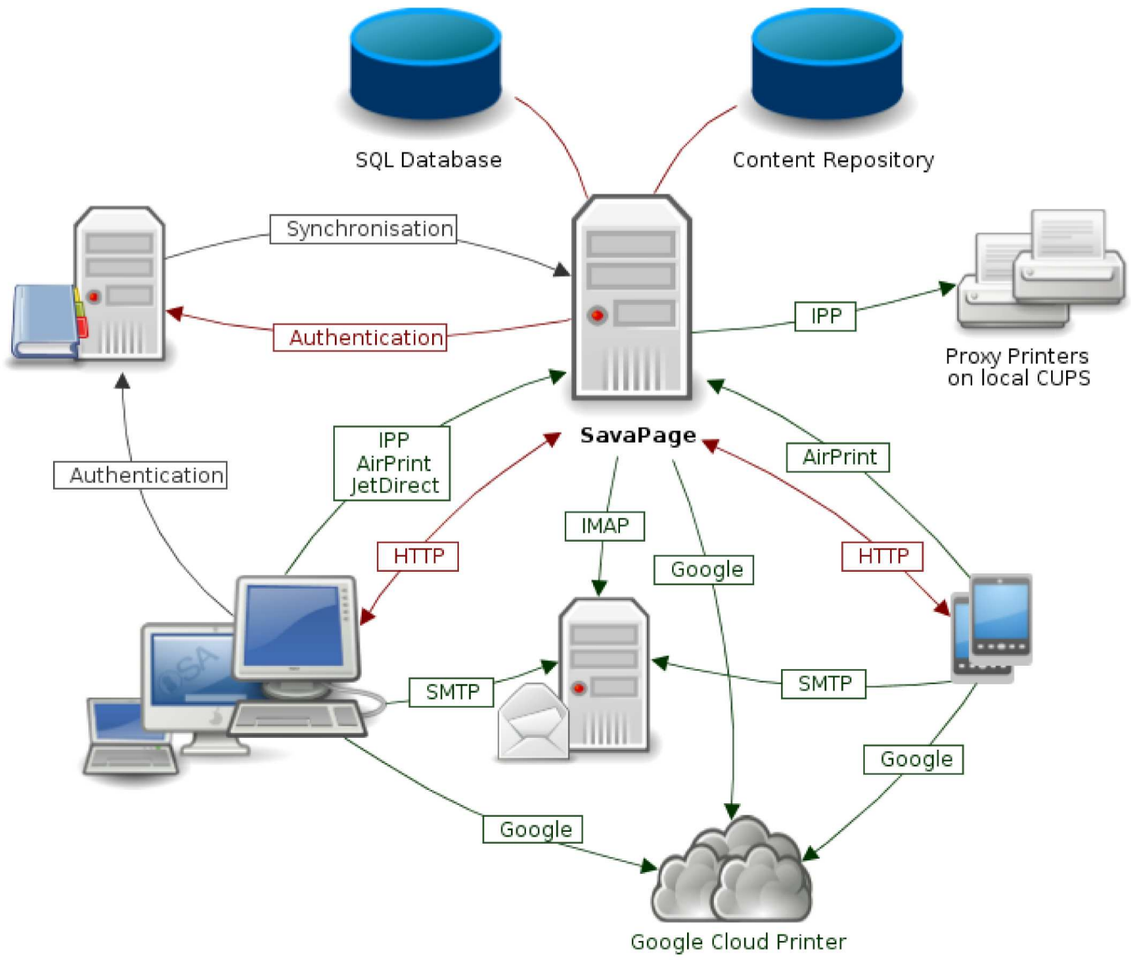

SavaPage
About
EUR 3.71
Trial Company Ltd.

SavaPage Demo
Rijk Ravestein (admin)
Help
€ 46.50

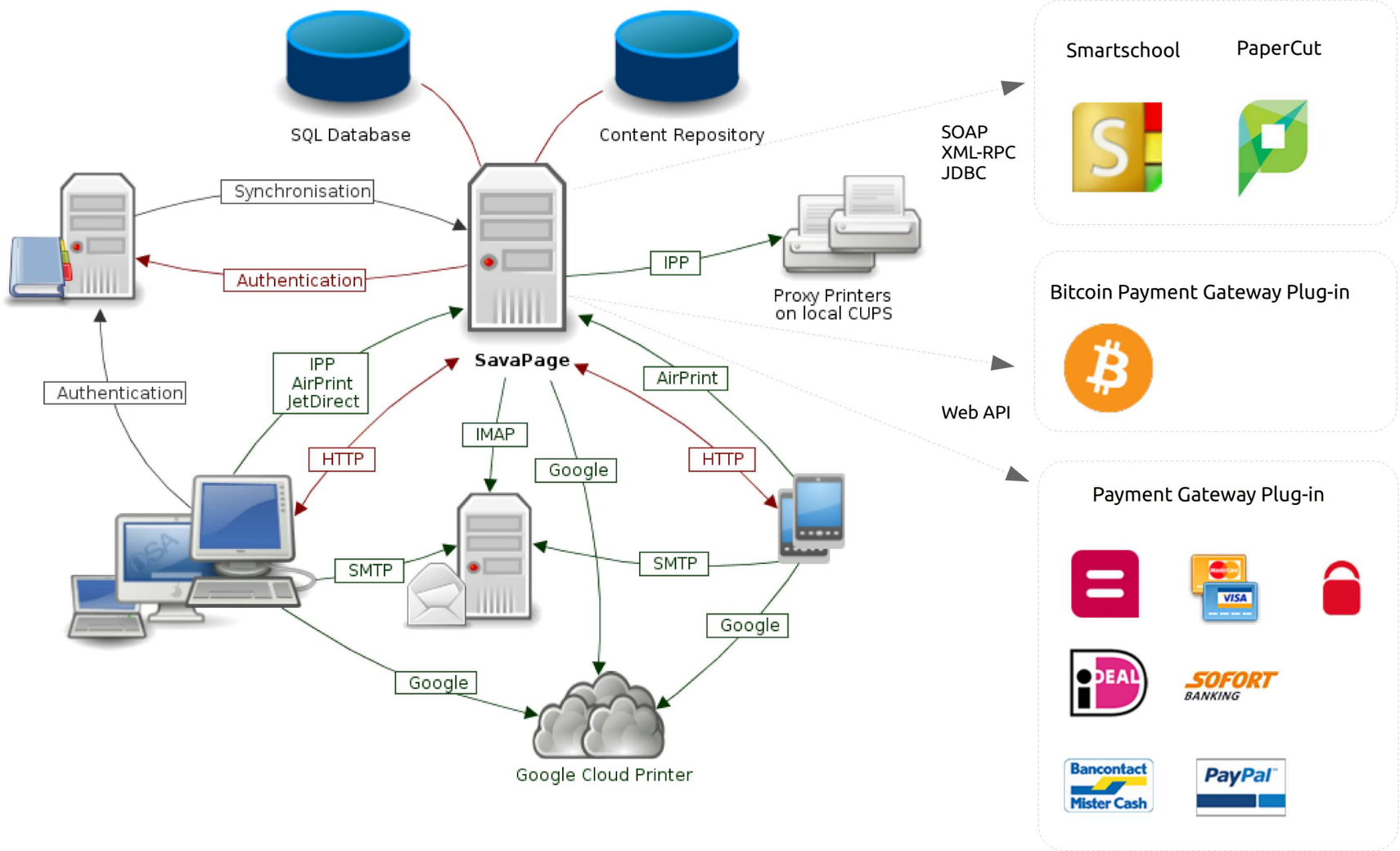
Demo

https://demo.savapage.org

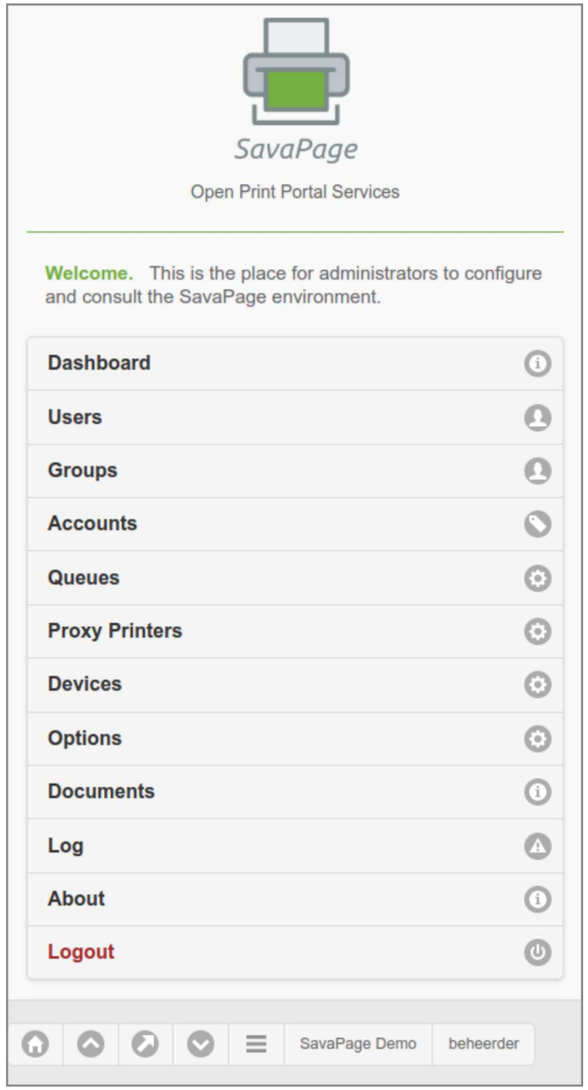
Behind the scenes

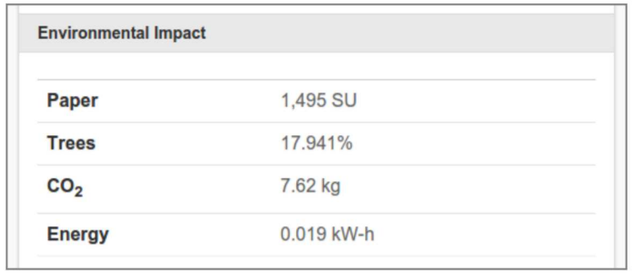


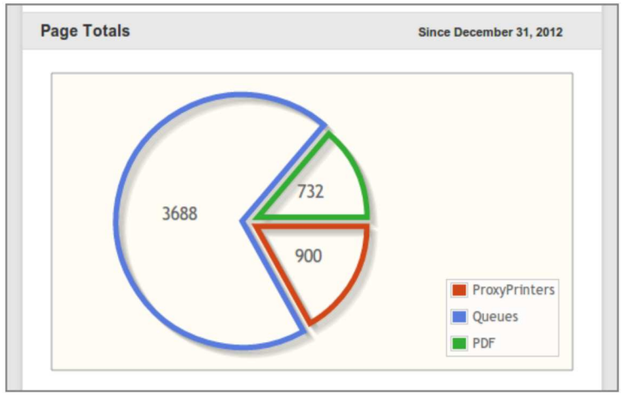
Plug-ins

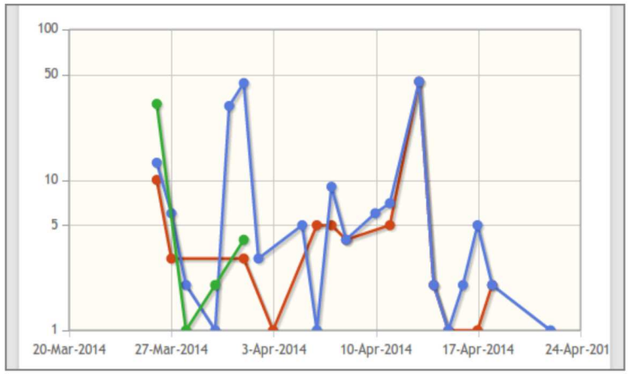

SQL Database
Content Repository
Synchronisation
Authentication
IPP
Proxy Printers
on local CUPS
SOAP
XML-RPC
JDBC
Smartschool
PaperCut
Bitcoin Payment Gateway Plug-in
Web API
Payment Gateway Plug-in
SavaPage
Authentication
IPP
AirPrint
JetDirect
AirPrint
IMAP
HTTP
Google
HTTP
SMTP
SMTP
Google
Google
Google Cloud Printer

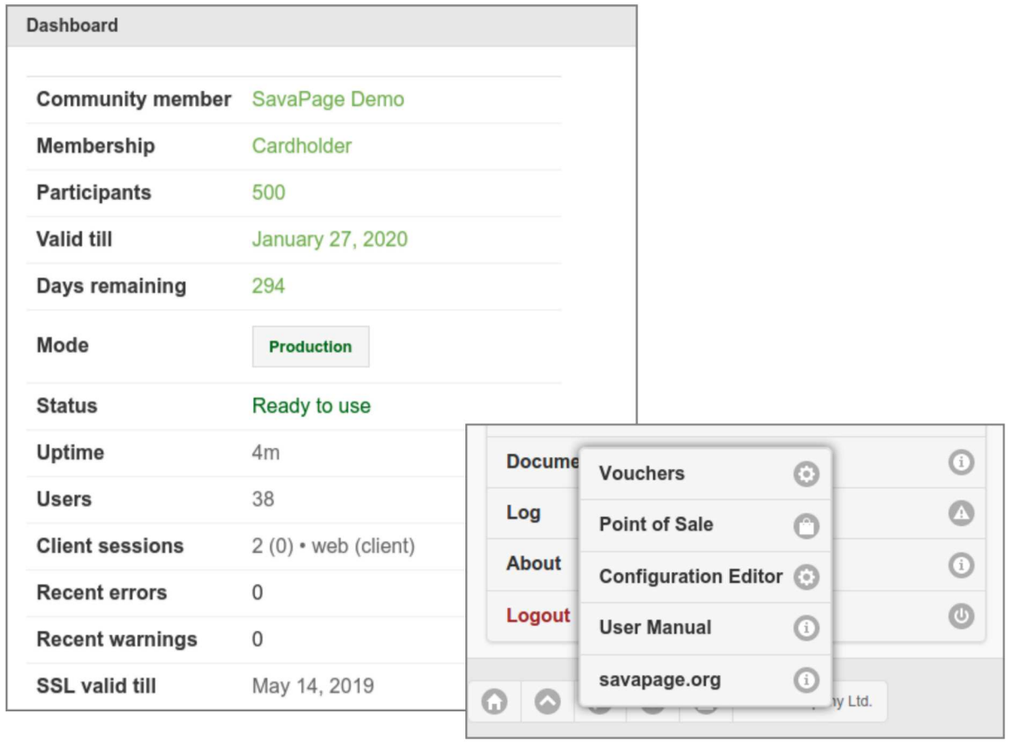
Admin Web App

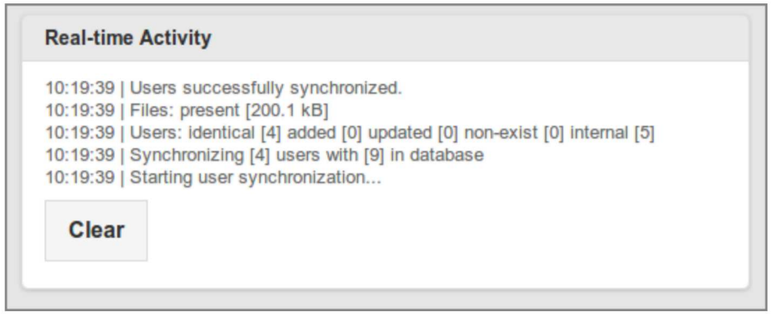












Admin Web App

NLLGG Nederlandse Linux Gebruikers Groep

Queues

Select and Sort

New

1 1

/ trusted

IPP Printer (reserved)
ipps://192.168.1.35:8632/printers/
192.168.1.0/24
Dec 31, 2012 ~ Nov 14, 2015
1,922 jobs, 4,939 pages, 1.4 GB

/airprint untrusted

AirPrint (reserved)
Apr 4, 2013 ~ Aug 15, 2015
54 jobs, 243 pages, 155.6 MB

Proxy Printers

Select and Sort

CUPS Synchronize

1 1

HL-1430-SERIES
HL-1430-SERIES
Jan 3, 2013 ~ May 21, 2013
229 jobs, 243 pages, 251 she

HL-2030-SERIES
HL-2030-SERIES
Jan 3, 2013 ~ Jan 11, 2015
495 jobs, 975 pages, 950 sheets, 111.1 MB
Member of Group: SECURE
← PI • Fast • Hold

Cost per media side

Use B/W as default

Source	One-sided		*Two-sided	
*auto	B/W	Color	B/W	*Color
top	0.0500	0.1000	0.0300	0.0700

A4 - white A4

Devices

Select and Sort

New Terminal New Card Reader

1 1

CARD-READER-PAMPUS active
→ PAMPUS
192.168.1.35:7772 • Next to PAMPUS terminal
Disconnected: Jan 13, 2015 5:39:27 PM

CARD-READER-RPI active
192.168.1.200:7772 • Raspberry PI @ Xerox
Connected: Jan 13, 2015 5:39:27 PM
Proxy Print • Fast • Hold • Single Printer • XEROX-WORKCENTRE-5890

PAMPUS active
← CARD-READER-PAMPUS
192.168.1.35 • Meeting room

PUNTER disabled
192.168.1.36 • Steven's desktop
Proxy Print • Printer Group • BROTHER (HL-2030-SERIES, HL-1430-SERIES)

Innovations (1)

- Just-in-time print-spooling
  - Spool files can be huge, held jobs use a lot of disk space
  - Job options are lost or irrelevant when spool file is moved to another queue
  - Original PDF + job options are held/released
    - Jobs need not be moved to a native release queue
    - Jobs options are retained
- Print Preview
  - Mindless printing
  - Print preview, concatenation, editing, letterheads
  - PDF Creation, *"why print when you can save-a-page"*
  - Save ink and toner with Eco Print and graphics filter

Innovations (2)

- One front-end printer
  - Multiple printer drivers on Windows desktop (bloatware)
  - One Generic Postscript Driver
- SSL printing
  - Sniffing print jobs and replaying them
    - http://www.irongeek.com/i.php?page=security/networkprinterhacking
  - IP printing on port 9100
  - ipp**s**://savapage:8632/printers (or http**s)**
  - Proxy printer connections are sand-boxed and centrally guarded
    - Printers in VLAN
- Minimal hardware requirements
  - 2 CPU cores, 2 GB RAM, 8 GB+ HDD, virtual machine compatible

We need to talk about PPD's

- PostScript Printer Description (PPD)
  - Files created by vendors to describe features and capabilities available for their PostScript printers.
- CUPS-PPD
  - CUPS extended the PPD concept to allow for PostScript printing to non-PostScript printing devices, by directing output through a **CUPS filter**.
  - A **chain of filters** converts print data to Page Description Language (PDL)
    - A **backend** sends this data to the print device
- IPP -> CUPS
  - Get-Printer-Attributes Operation
  - https://www.pwg.org/ipp/ipp-registrations.xml
  - Vendor PPD options != IPP Keywords/Attributes

SavaPage PPD Extensions

- PPD to IPP Mappings
- PPD Rules
- IPP Rules
  - SPConstraint
- Job Ticket Extensions
  - Cost Rules for Media, Sheet, Copy, Set

```
*VENPrintColorMode print-color-mode
*VENPrintColorMode *VENMonochrome monochrome
*VENPrintColorMode VENColor       color
```

```
*SPSubst/sheet-collate/collated: staple-and-collate \
   org.savapage-finishings-staple/!3 \
   *StapleCollate
```

```
*SPExtra/org.savapage-finishings-punch/74: punch-dual-left \
   *CNPunch/Left
```

```
*SPConstraint: transparency-two-sided \
    media-type/transparency \
    sides/!one-sided
```

```
*SPJobTicket/Media/Cost: 0.0430 white-A4-080-S \
   media-type/ext.paper-80 \
   media-color/white \
   media/iso_a4_210x297mm \
   sides/one-sided
```

```
*SPJobTicket/Sheet/Cost: 0.5000 laminate-A4 org.savapage-finishings-ext/laminate \
    media/iso_a4_210x297mm
```

```
*SPJobTicket/Copy/Cost: 0.5000 folder-A4 org.savapage-finishings-ext/ext.folder \
    media/iso_a4_210x297mm
```

```
*SPJobTicket/Set/Cost: 0.05 banner-A4 org.savapage-job-sheets/!none \
    org.savapage-job-sheets-media/iso_a4_210x297mm
```

SavaPage IPP Extensions

- Internal IPP Extensions
- External IPP Extensions

Attribute	Value	Name	Syntax	Reference
org.savapage-finishings-jog-offset	3	none	1setOf type2 enum	RFC8011
org.savapage-finishings-jog-offset	14	EachSet	1setOf type2 enum	PWG5100.1

```
*SPJobTicket/Copy: org.savapage.ext-myoption \   ❶
   *none ext.choice-1 ext.choice-2

*SPJobTicket/Copy/Cost: 0.1000 myrule-1 \        ❷
   org.savapage.ext-myoption/ext.choice-1 media/iso_a4_210x297mm

*SPJobTicket/Copy/Cost: 0.1500 myrule-2 \        ❸
   org.savapage.ext-myoption/ext.choice-2 media/iso_a3_297x420mm
```

❶ Definition of External IPP extension `myoption` with two custom choices. The default choice `none` is a reserved internal value, indicating that the option is not selected.

❷ Cost rule for `ext.choice-1` and A4 media.

❸ Cost rule for `ext.choice-2` and A3 media.

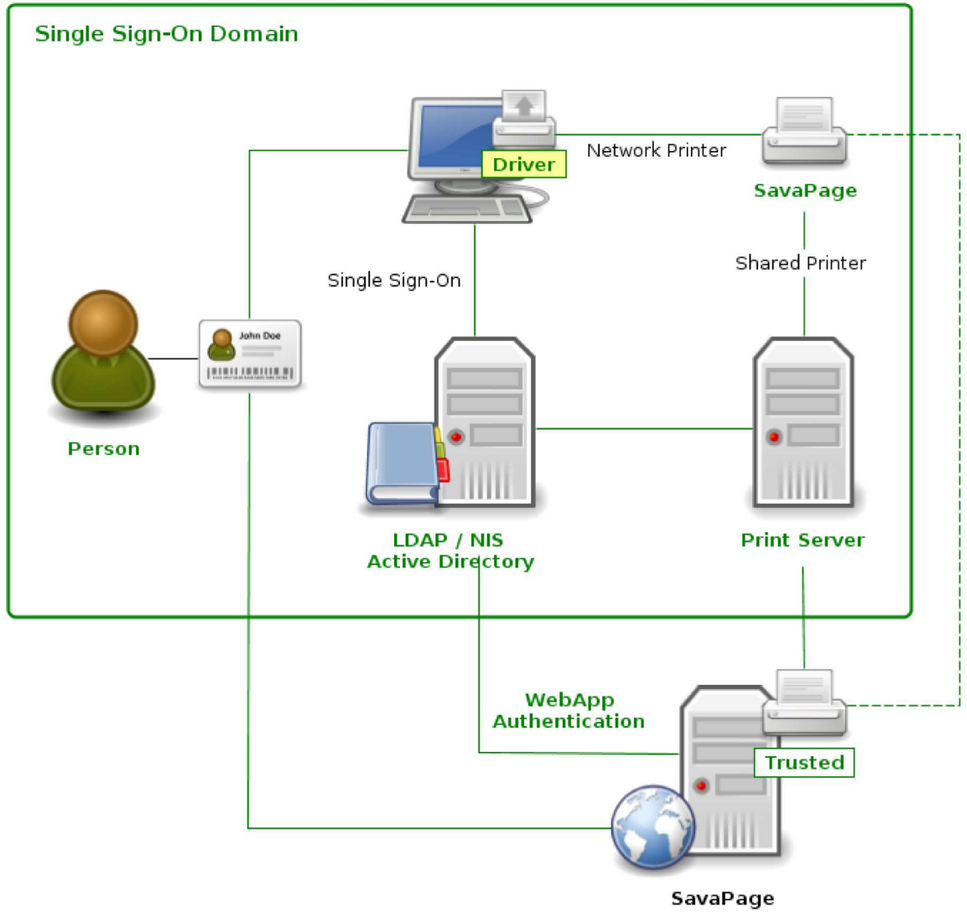
Security and privacy concerns (out-of-scope)

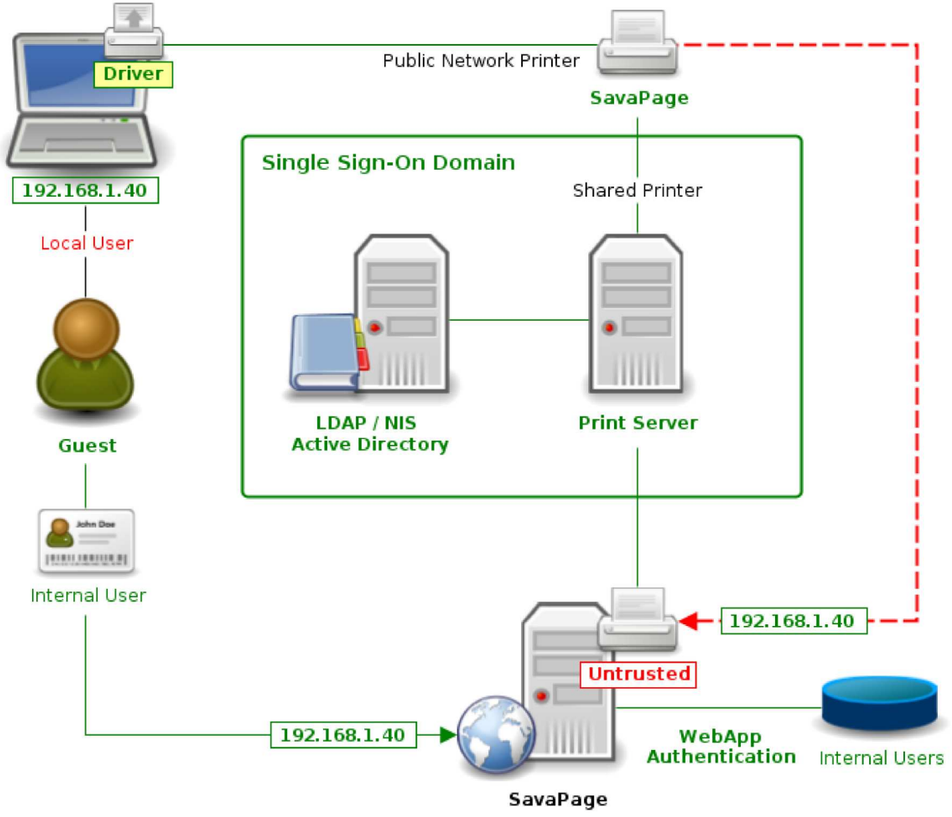
- Saved copies on printer HDD
  - Configure your MFP (AES encrypt HDD)
- Secure MFP access
  - Network access
  - Device access
- ~~Google Cloud Print?~~

Security and privacy challenges (in-scope)

- Tracking and Tracing
  - Database
    - Document names
    - Anonymize jobs
  - PDF files
    - Personal queue, Archive
- Monitoring and Control
  - Transient data (control)
  - Trends, violations (monitoring)

It's all about trust





SavaPage Community

- Residents – Subscription
  - Technical Support
  - Requirements
- Partners – Fair share
  - Development Partners
  - Deployment Partners
    - Service Level Agreement
  - Translation Partners
- Community Manager
- Legal steward

Resident Subscription

Corporate | Government

Participants	Enrollment	Yearly
25	€350	€160
50	€425	€160
75	€500	€160
100	€550	€160
150	€675	€160
Above 150		
+10	€15	€3

Educational | Non-profit

Participants	Enrollment	Yearly
500	€425	€160
1000	€550	€160
1500	€675	€160
2000	€800	€160
2500	€925	€185
3000	€1050	€210
Above 3000		
+100	€25	€5

Special pricing Sponsorship

Extensions

Platform	Extension	Yearly
PaperCut	Delegated Print	€750
	User Sync and Auth Interface	€100
Smartschool	OAuth and Notifications	€150
	~~Afdrukcentrum~~ [2]	~~€750~~
Google	~~Google Cloud Print~~ [3]	~~€250~~
	Google Cloud Directory	€200
	OAuth	€150
Microsoft	Active Directory	€200
	Windows Driver Print [4]	€175
	SavaPage Client App [5]	€250
Oracle	External Database	€250
Mollie	Generic Payment Gateway [6]	on request
~~blockchain.info~~	~~Bitcoin Payment Gateway~~ [7]	on hold

SavaPage Community Status

- Residents
  - BE (13), CH (1), RO (1), QA (1), NL (1)
    - Participants: 48000
- Partners
  - Integration Partners
    - BE (1)
  - Deployment Partners
    - NL (1)
  - Development Partners
    -
  - Translation Partners
    -

Community Road-map

- Development
  - Resident Requirements
    - IPP Routing + Plugin
    - Google Cloud Directory
  - RESTful API
- Vacancies
  - Partners
    - Development
    - Deployment

Thank you for your attention

https://community.savapage.org

`Mission`	Produce Open Printing Solutions with Free and Open Source Software.
`Vision`	A World where People & Planet enjoy a sustainable Open Printing Experience.