CHÂTEAU IT

IT OPLEIDING IN FRANKRIJK

Making Ansible playbooks to configure Single-Sign-On for popular open source applications

Who am I?

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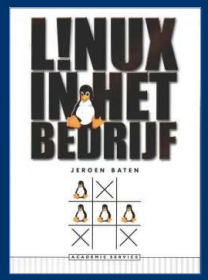
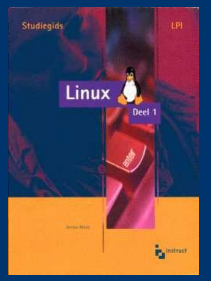
- Jeroen Baten (English/Spanish: Yerun)
- Job title : Open Source expert @ Chateau IT
- Author of 12 books (4 more in beta)
- Dad of 5 girls
- (former) volunteer fire fighter
- Scouting
- Trainer, teacher, hacker





What do I do?

- Open source consultancy
- Teaching/training
  (Python, Web, Linux, Zabbix, etc)
- Chateau IT: job retraining, from X to IT
  - **Whatever your background, if you want to switch to a carreer in IT, contact me jeroen@chateau-it.nl**

Another project

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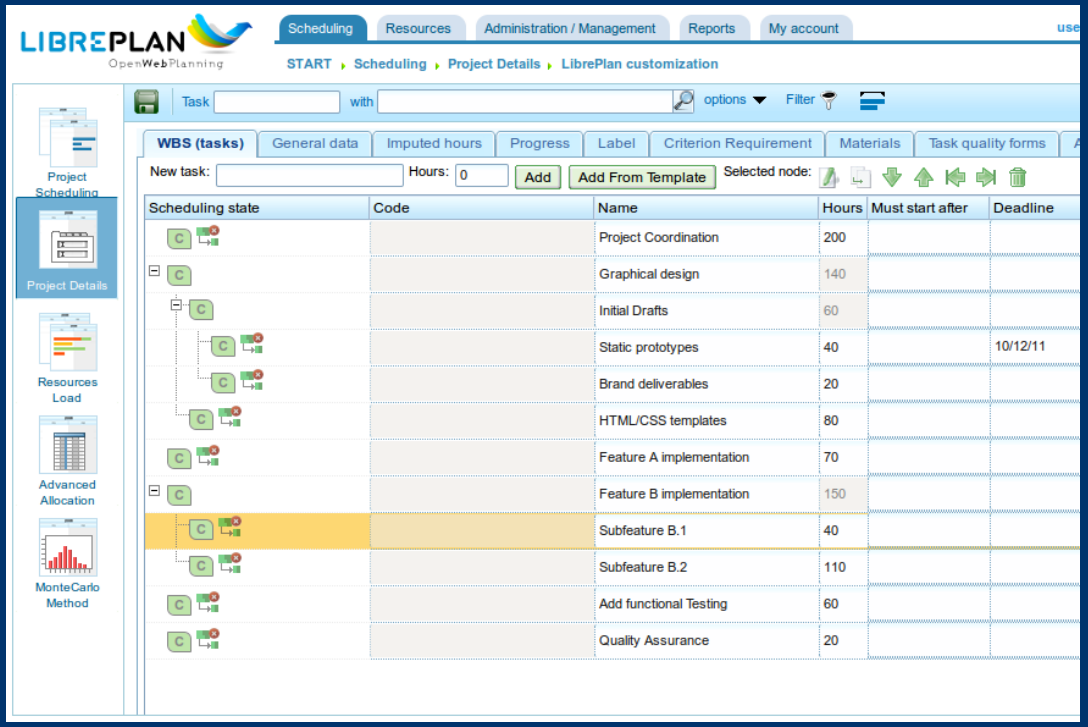
- LibrePlan LIBREPLAN OpenWebPlanning
- Web-based project management appl.
- Very cool!
- www.LibrePlan.dev



Let me start with apologies first...

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Talking the same language… can still cause a culture clash.
With respect to the code of conduct:
Please forgive me where applicable.
(Tip: Dutch people take every English text literally!)

ANGLO-DUTCH TRANSLATION GUIDE

WHAT THE BRITISH SAY	WHAT THE BRITISH MEAN	WHAT THE DUTCH UNDERSTAND
With all due respect ...	*I think you are wrong.*	*He is listening to me.*
Perhaps you would think about ... I would suggest ...	*This is an order. Do it or be prepared to justify yourself.*	*Think about this idea and do it if you like.*
Oh, by the way ...	*The following criticism of the purpose of the discussion is ...*	*This is not very important.*
I was a bit disappointed that ...	*I am very upset and angry that ...*	*It doesn't really matter.*
Very interesting ...	*I don't like it.*	*They are impressed.*
Could you consider some other options?	*Your idea is not a good one.*	*They have not yet decided.*
Please think about that some more.	*It's a bad idea. Don't do it.*	*It's a good idea. Keep developing it.*
I'm sure it's my fault.	*It's not my fault.*	*It was their fault.*
That is an original point of view.	*Your idea is stupid.*	*They like my ideas!*

SOURCE NANETTE RIPMEESTER HBR.ORG

The project in short

- Build IT landscape @ company and copied for other company in the group.
- Foundation: Proxmox, FreeIPA LDAP
- Installed applications Xwiki, Zabbix, Jenkins, Nextcloud, GitLab, Odoo, CMDBuild etc in separate vm’s.
- Got question how to upgrade the landscape.
- So I proposed to make everything SSO using Ansible playbooks.
- And so our adventure started...

Basic Lingo

- Application that uses SSO = SP
  - Service (because application) provider
- Application that does SSO = IdP
  - Identity provider, in our case: Keycloak
- ACS: Assertion Consumer Service URL (SP sign-in URL)
- Ansible
  - Language to write configuration recepies
- JSON
  - The only good thing that came from JavaScript :-)

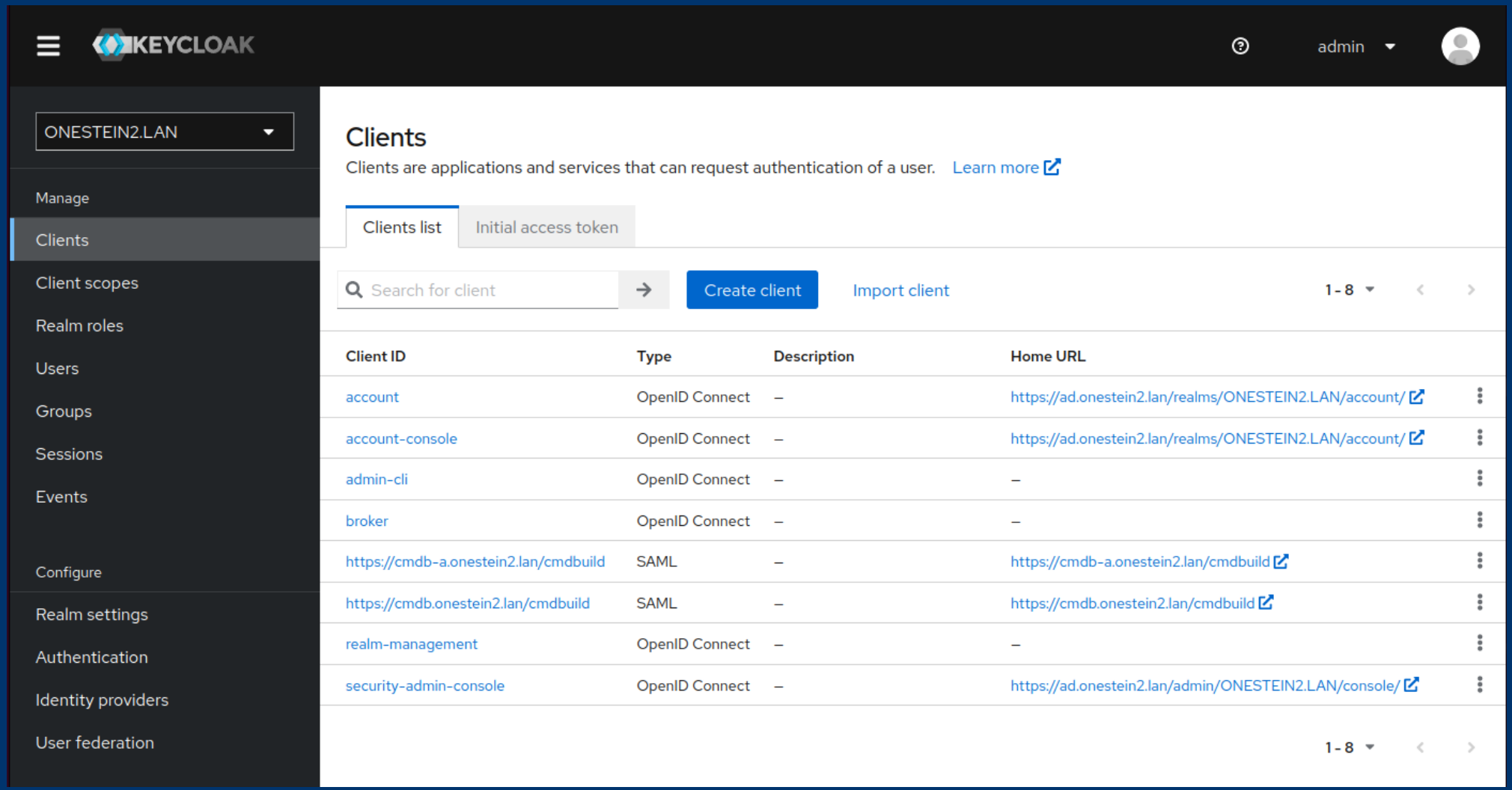
Basic SSO process flow

- User clicks ‘login’ on some application (SP)
- Browser of user is redirected to IdP (Keycloak)
- User is presented with login widget
- User logs in (successfully) or error/denied message.
- If not yet 2FA configured but set as mandatory he/she gets 2FA setup dialog.
- Browser of user is redirected to SP with some credentials proven he has successfully logged in at IdP.
- User is logged in.
- Every other application login redirects to IdP.
- IdP sees existing ticket of user and redirects immediately with authentication info.

Basic SSO setup

- User-id’s in FreeIPA
- Keycloak for web SSO server, syncs with FreeIPA
- Keycloak has a client definition for every connected application
- Added first application (Xwiki)
  - This was a walk in the park, good documentation.
- Added another application, etc.

Keycloak clients list



- Let’s have a look at the program flow

Ansible playbook flow

- Two Ansible variable files: Global-vars and encrypted-vars
- Playbook works on application vm
- Playbook retrieves Keycloak endpoint info
- Playbook checks if Keycloak client exists, if yes, deletes
- Playbook fills client definition template and uploads to Keycloak
- Checks if client created successfully
- Downloads shared secret if relevant (open-idc)
- Ansible leaves you with a configured application
- Displays remaining manual tasks, if any.

Ansible SAML example: Zabbix

- Read global vars, Read encrypted content
- Download Zabbix 5.4 repo package for Ubuntu 20.04, install 5.4 repo list,
- Install all needed packages
- Configure zabbix database password
- Setup Zabbix Postgresql database user, Setup Zabbix Postgresql database, Load initial Zabbix dataset when db just created
- Make SSL dir for nginx, Copy SSL key and cert to ssl dir, Install nginx config file
- Generate key on Zabbix server
- Retrieve token url from Keycloak server, Store url for easier retrieval, Retrieve endpoint info for our realm {{ realm }}, Store authorization_endpoint for faster retrieval, Store token_endpoint for faster retrieval
- Store userinfo_endpoint for faster retrieval, Retrieve authentication token from token-service url, Store access token into variable for easier retrieval
- Retrieve IDP metadata descriptor to use the 509 formatted certificate, Save IDP XML metadata to file for processing
- Run xmlstarlet to retrieve X509Certificate, Store output in certificate variable
- Create idp.crt file
- Retrieve current list of clients and search for already existing "{{ zabbix_client_id }} "
- Find ID in returned json
- copy remote ssl files to remote /tmp, Remove first line from tmp files, Retrieve remote ssl cert, Retrieve remote ssl key
- Delete client id "{{ zabbix_client_id }}" if it already exists.
- Convert Ninja template to variable
- Upload JSON template file to create new Client ID on Keycloak server
- If all went well we now have a location of the newly created Client ID
- (Re)start Zabbix server
- (Re)start Nginx server
- Post-install message IT IS IMPORTANT TO READ THIS

Ansible JSON tricks

- "baseUrl": "{{ zabbix_server_url }}",
- "adminUrl": "{{ zabbix_server_url }}**/index_sso.php?acs**", ← application specific Acs
- "saml_single_logout_service_url_redirect": "{{ zabbix_server_url }}/**index_sso.php?sls**", ← application specific
- "id": "{{ lookup('community.general.random_string', length=20) | to_uuid }}",
- "saml.signature.algorithm": "RSA_SHA256",
- "saml.signing.certificate": "{{ sp_crt.stdout }}",
- "saml.signing.private.key": "{{ sp_key.stdout }}",
- "saml_force_name_id_format": "true",
- "saml_name_id_format": "username", "user.attribute": "email",
- Template sent to Keycloak has random ID´s
  - "protocolMappers": [{
  - "id": "{{ lookup('community.general.random_string', length=20) | to_uuid }}",
  - "name": "zabbixuser",
  - "protocol": "saml",
  - "protocolMapper": "saml-user-attribute-mapper",
  - "consentRequired": false,
  - "config": {
  - "user.attribute": "email",
  - "friendly.name": "email",
  - "attribute.name": "email"
- "saml.multivalued.roles": "false",
- "name": "role list",

Do-it-yourself (DIY)

- Once you have a working SSO setup:
  - Use contrib/get-keycloak-client-list.sh
  - Redirect to file
  - Cut out working client definition
  - Pipe through jq program
  - Start replacing settings with variables
  - Tool: diff <(jq --sort-keys . $1) <(jq --sort-keys . $2)

Gotchas

- Everything works better when using http**S(!)**
- Tomcat expects ssl keystore to have password ‘changeit’
- Some application developers can’t read. If the standard says ‘optional’ that is NOT the same as ‘mandatory’.
- (Some/all) applications are very badly documented.
- Adding FreeIPA → Keycloak user-id sync midway was not a smart idea.
- Ansible can solve just about any problem
- Do NOT use Keycloak 18.x.y
  - unless you like long searches why roles don’t work

Your job (if you chose to accept it)

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Thank you for your attention!

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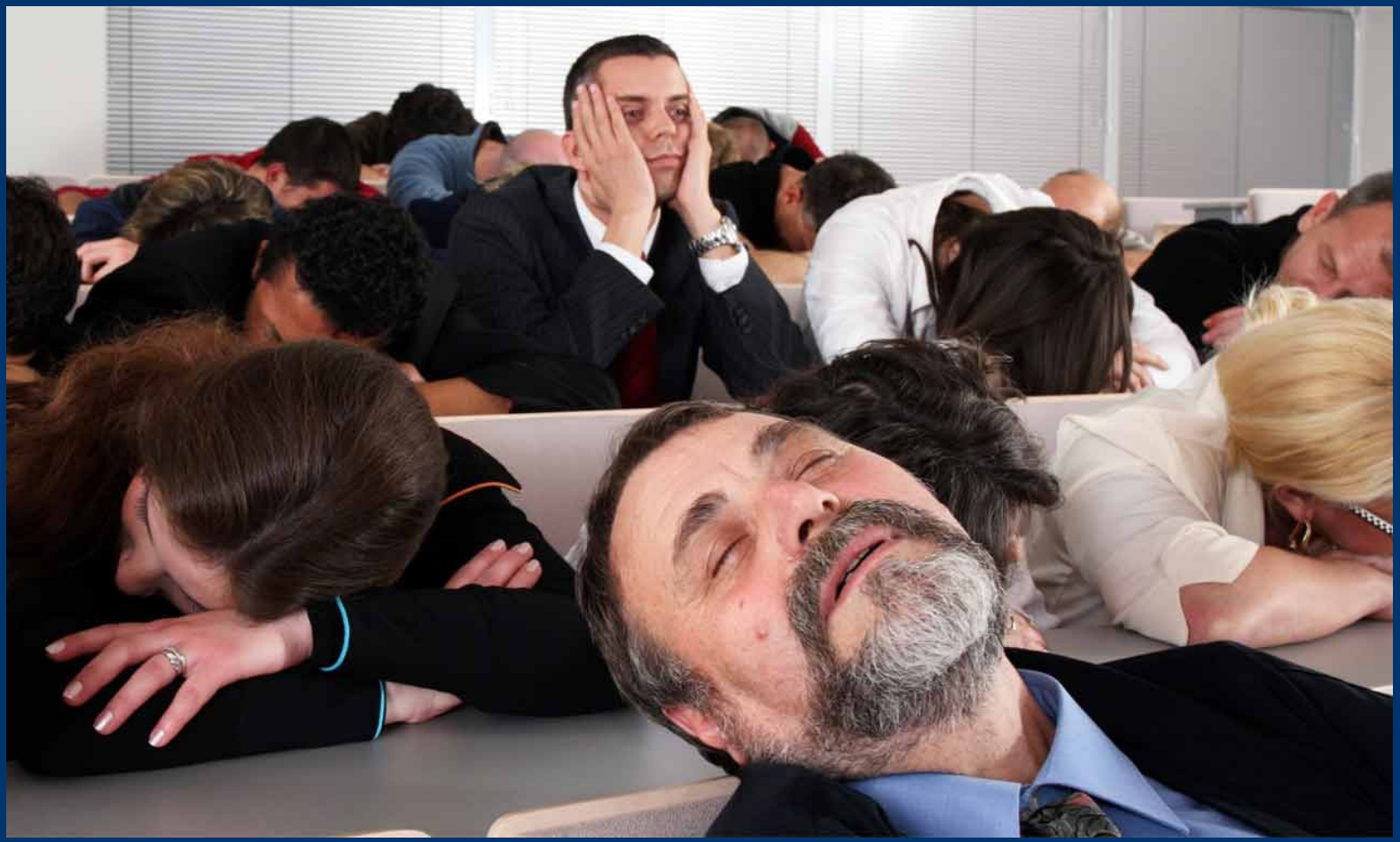

Questions for me?: jeroen@chateau-it.nl