

**FOSDEM**'24



# Empowering FreeIPA: a dive into the modern WebUI

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# Agenda

- ▶ Introduction on FreeIPA WebUI
- ▶ Motivations for the change
- ▶ Modernizing the WebUI
- ▶ Demo
- ▶ Future roadmap

# Introduction on FreeIPA

## Historical context

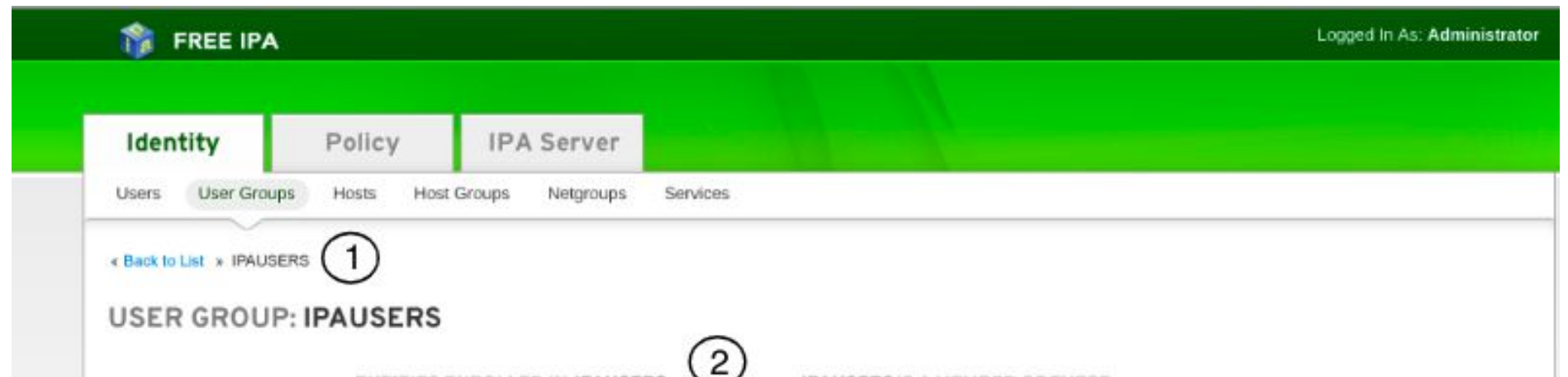
- ▶ FreeIPA is an integrated security information management solution
- ▶ Aims to provide a centrally managed Identity, Policy, and Audit (IPA) system
- ▶ Software components: Linux (Fedora), 389 Directory Server, MIT Kerberos, NTP, DNS, Dogtag (Certificate System), SSSD and other open-source components
- ▶ Management through CLI and web interface (WebUI)
- ▶ First version released on **Aug. 1st 2007**

# Introduction on FreeIPA WebUI

## Historical context

### First versions:

- ▶ Goal: to have parity between the UI and CLI
- ▶ Based on TurboGears
- ▶ Tech stack: C++, Python, JavaScript (jQuery). Basically, a single page application built with vanilla JavaScript
- ▶ Problems: it was needed to optimize the number of HTTP requests and minimize the JavaScript file sizes (the WebUI used a lot of JS files)



# Introduction on FreeIPA WebUI

## Historical context

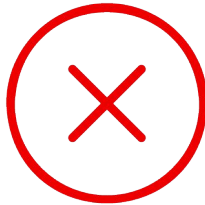
### Current WebUI:

- ▶ Dojo library was used to provide modules, build, and router functionality
- ▶ Improvement: Transforming FreeIPA JavaScript packages into AMD modules to build them into a single file → This would reduce the number of JS files to be processed
- ▶ WebUI directory structure changed to better adapt to this transformation
- ▶ 2014: The styles and code were changed to match RCUE (Red Hat common user environment) → Which later became PatternFly

	User login	First name	Last name	Status	UID
<input type="checkbox"/>	admin		Administrator	✓ Enabled	1142400000

# Motivations for the change

## Why



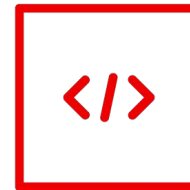
### PatternFly 2 unsupported

Fixing/evolving the webUI is difficult with no active PF2 community of developers



### PatternFly 5 supported

Better accessibility, an active toolkit community, and portfolio alignment



### React to replace Dojo

Modern, secure, popular, and can use with specific framework-related libraries

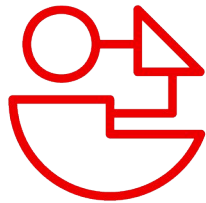


### Persistent problems

Accessibility / responsiveness issues, data limits, requests blocked by current implementation

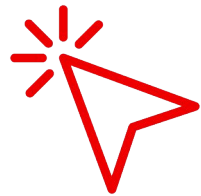
# Motivations for the change

## How



### Revisited architecture

Coding best practices,  
updating communication layer,  
and QE testing



### Targeted enhancements

Make the application better to  
use, while minimizing disruption  
for current users



### Better documentation

Enhance the  
documentation sources to  
be accessible for upcoming  
contributors



### Upstream engagement

Increased communications,  
gather feedback, share new  
updates with the community

# Introduction on FreeIPA WebUI

## Technical Stack Transition

Current WebUI:



**PatternFly** (v2)

dojo

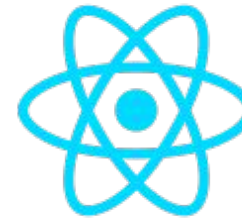


pytest

Modern WebUI:



**P A T T E R N F L Y** (v5)



cypress

cucumber

Source:  
PatternFly: <https://www.patternfly.org/>  
Dojo: <https://dojotoolkit.org/>  
React: <https://react.dev/>  
Cypress: <https://www.cypress.io/>  
Cucumber: <https://cucumber.io/>



# Modernizing the WebUI

## Current vs Modern

The current web UI features a top navigation bar with tabs for Identity, Policy, Authentication, Network Services, and IPA Server. Below this is a secondary navigation bar with tabs for Users, Hosts, Services, Groups, ID Views, and Automember. The main content area shows the 'User Group: admins' page with various filter tabs and a table of members.

User login	UID	Email address	Telephone Number
<input type="checkbox"/> admin	613800000		

Navigation - Current (PF2)

The new web UI features a dark sidebar navigation menu with a hamburger menu icon. The main content area shows the 'User group: admins' page with a 'Members' tab and a table of members.

User login	UID	Email address	Phone
<input type="checkbox"/> admin	1151000000		

Navigation - New (PF5)

# Modernizing the WebUI

## Current vs Modern

The current web UI settings form is divided into two main sections: Identity Settings and Account Settings. Identity Settings includes fields for Job Title, First name, Last name (with a required asterisk), Full name (with a required asterisk), Display name, Initials, GECOS (with a value of 'api.test1'), and Class. Account Settings includes fields for User login (admin), Password (masked with asterisks), Password expiration, UID (61380000), and GID (61380000). It also features Principal aliases (admin@DEMO1.FREEIPA.ORG and root@DEMO1.FREEIPA.ORG, each with a Delete button), an Add button, Kerberos principal expiration (YYYY-MM-DD, hh, mn, UTC), Login shell (/bin/bash), Home directory (/home/admin), SSH public keys (Add button), Certificates (Add button), and Certificate mapping data (Add button).

Settings form - Current (PF2)

The modern web UI settings form features a dark sidebar with navigation options: Identity, Users, Hosts, Services, Groups, ID views, Automember, Policy, Authentication, Network services, and IPA server. The main content area shows the user 'admin' with a 'Settings' tab. It includes a 'Jump to section' sidebar with links to Identity settings, Account settings, Password policy, Kerberos ticket policy, Contact settings, Mailing address, Employee information, Misc. information, and User Attributes for SMB services. The form fields are organized into sections: Identity settings (First name, Job title, Last name, GECOS, Full name, Class) and Account settings (User login, Home directory, Password, SSH public keys, Password expiration (UTC), Certificates, UID, Certificate mapping data). Action buttons at the bottom include Refresh, Revert, Save, Disable, and Enable.

Settings form w/jump links - New (PF5)

# Modernizing the WebUI

## Current vs Modern

<input type="checkbox"/>	abrick	A	Brick	✔ Enabled	1151000007	abrick@ipa
<input type="checkbox"/>	admin		Administrator	✔ Enabled	1151000000	
<input type="checkbox"/>	bcarnivale	B	Carnivale	✔ Enabled	1151000008	bcarnivale@ipa
<input type="checkbox"/>	cdriver	C	Driver	✔ Enabled	1151000009	cdriver@ipa
<input type="checkbox"/>	deverly	D	Everly	✔ Enabled	1151000010	deverly@ipa
<input type="checkbox"/>	eferguson	E	Ferguson	✔ Enabled	1151000011	eferguson@ipa
<input type="checkbox"/>	fgrape	F	Grape	✔ Enabled	1151000012	fgrape@ipa
<input type="checkbox"/>	ghowell	G	Howell	✔ Enabled	1151000013	ghowell@ipa
<input type="checkbox"/>	hinglalls	H	Inglalls	✔ Enabled	1151000014	hinglalls@ipa
<input type="checkbox"/>	hlowell	Hugh	Lowell	✔ Enabled	1151000006	hlowell@ipa
<input type="checkbox"/>	ijones	I	Jones	✔ Enabled	1151000015	ijones@ipa
<input type="checkbox"/>	jkral	J	Krall	✔ Enabled	1151000016	jkral@ipa
<input type="checkbox"/>	kloughton	K	Loughton	✔ Enabled	1151000017	kloughton@ipa
<input type="checkbox"/>	lmedley	L	Medley	✔ Enabled	1151000018	lmedley@ipa
<input type="checkbox"/>	mnorton	M	Norton	✔ Enabled	1151000019	mnorton@ipa
<input type="checkbox"/>	norleans	N	Orleans	✔ Enabled	1151000020	norleans@ipa
<input type="checkbox"/>	opowers	O	Powers	✔ Enabled	1151000021	opowers@ipa

The screenshot shows the FreeIPA web interface. On the left is a dark navigation sidebar with a hamburger menu icon and the 'FreeIPA' logo. The sidebar contains several menu items: Identity, Users (with sub-items for Active, Stage, and Preserved users), Hosts, Services, Groups, ID views, Automember, Policy, Authentication, Network services, and IPA server. On the right is a table of users. The table has columns for checkboxes, usernames, first names, last names, status, IDs, and email addresses. The 'Users' menu item in the sidebar is highlighted, and the table below it shows a list of users including 'admin', 'jsmith', and a series of 'sother' users.

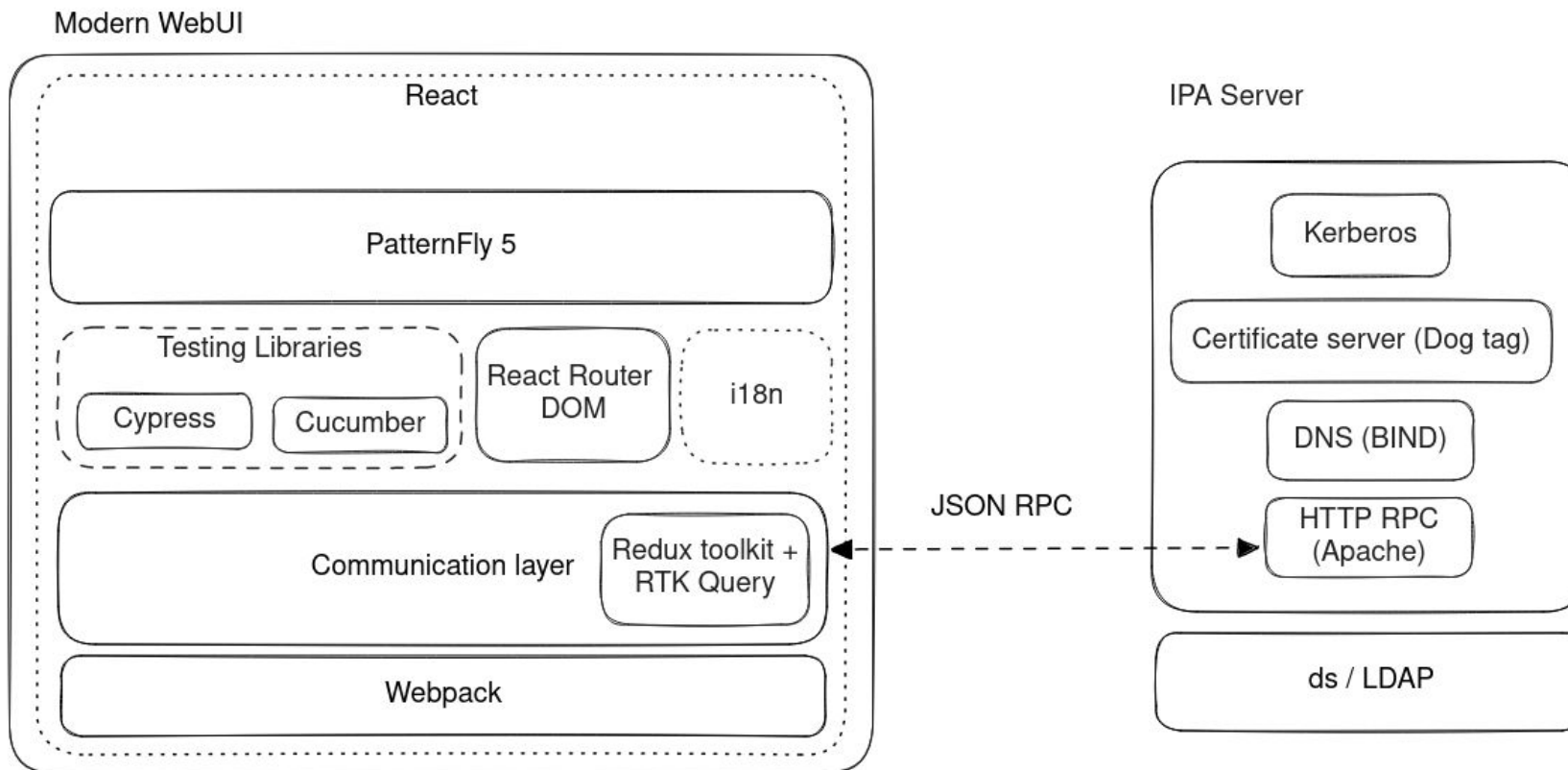
Scrolling - Current (PF2)

Scrolling - New (PF5)

# Modernizing the WebUI

# Modernizing the WebUI

## Architecture



# Modernizing the WebUI

## New testing infrastructure

- ▶ BDD with Gherkin/Cucumber/Cypress
- ▶ Running in [GitHub Actions](#), server provisioned with Vagrant
- ▶ Executed for every PR
- ▶ In case of failure, screenshots and step-by-step video are stored as artifacts
- ▶ Easy local debugging with Cypress built-in graphical debugger - shows state for each step of the test execution

**Cypress Results**

Result	Passed	Failed	Pending	Skipped	Duration
Passing	1	0	0	0	17.735s

All checks have passed  
3 successful checks [Hide all checks](#)

- Gating tests / Audit and build (pull\_request) Successful in 3m [Details](#)
- Gating tests / Integration tests (pull\_request) Successful in 22m [Details](#)
- docs/readthedocs.org:freeipa-webui — Read the Docs build succeeded! [Details](#)

# Modernizing the WebUI

## Old and new - equivalent test case comparison

```
self.init_app()

self.add_record(user.ENTITY, user.DATA, navigate=False)
self.navigate_to_record(user.PKEY)
```

```
ENTITY = 'user'

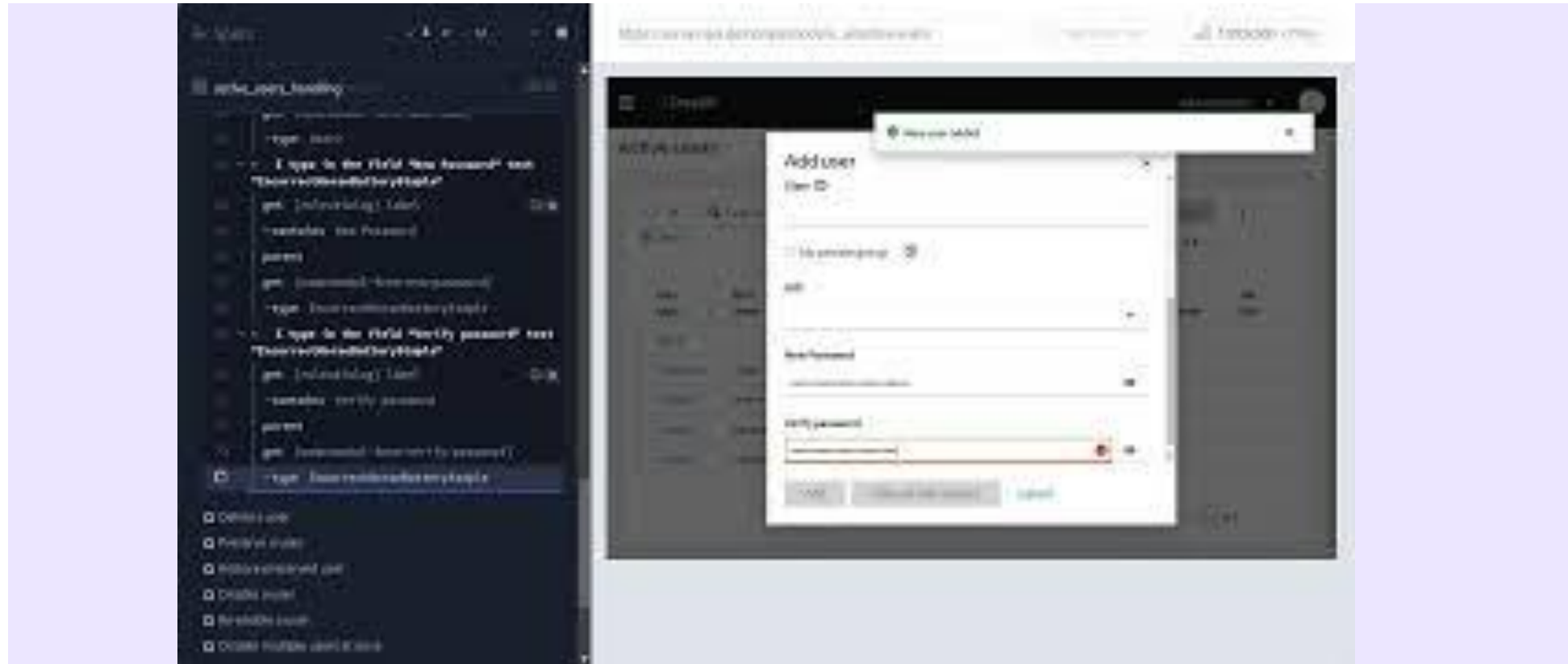
PKEY = 'itest-user'
DATA = {
    'pkey': PKEY,
    'add': [
        ('textbox', 'uid', PKEY),
        ('textbox', 'givenname', 'Name'),
        ('textbox', 'sn', 'Surname'),
    ],
    'add_v': [
        ('textbox', 'givenname', 'Name'),
        ('textbox', 'sn', 'Surname'),
        ('label', 'uid', PKEY),
    ],
    'mod': [
        ('textbox', 'givenname', 'OtherName'),
        ('textbox', 'sn', 'OtherSurname'),
        ('textbox', 'initials', 'NOS'),
        ('textbox', 'loginshell', '/bin/csh'),
        ('textbox', 'homedirectory', '/home/alias'),
        ('multivalued', 'telephonenumber', [
            ('add', '123456789'),
            ('add', '987654321'),
        ]),
        ('multivalued', 'mail', [
            ('add', 'one@ipa.test'),
            ('add', 'two@ipa.test')
        ])
    ]
}
```

Scenario: Add a new user

```
Given I open the side menu
* I click on "Active users" tab
* I close the side menu
* there is only admin user active
When I click on "Add" button
* I type in the field "User login" text "testuser1"
* I type in the field "First name" text "Arthur"
* I type in the field "Last name" text "Dent"
* I type in the field "New Password" text "ILoveKlingonPoetry42"
* I type in the field "Verify password" text "ILoveKlingonPoetry42"
* in the modal dialog I click on "Add" button
Then I should see "testuser1" entry in the data table
```

# Modernizing the WebUI

Old and new - equivalent test case comparison





# Modernizing the WebUI

## Modern WebUI live instance

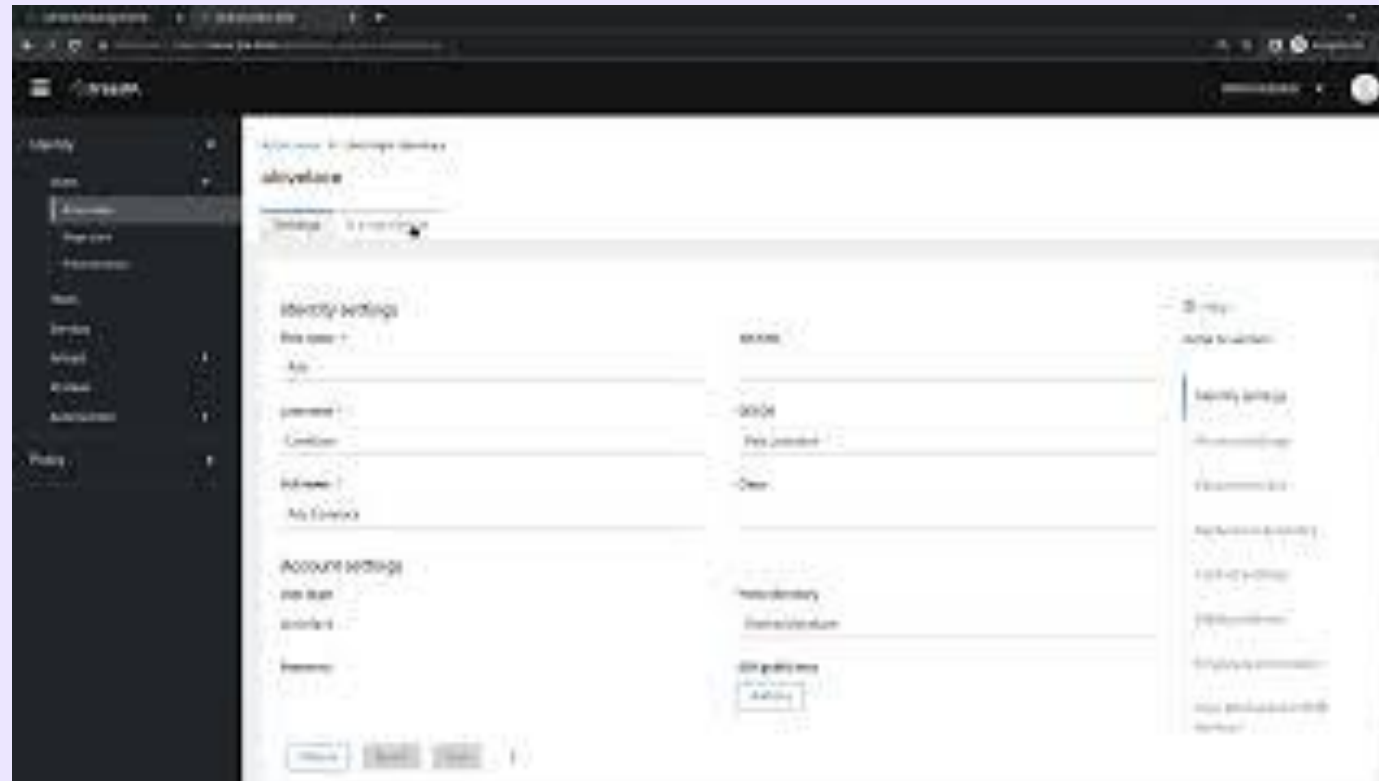
### 1. Log into the current WebUI live instance

- a. <https://ipa.demo-modernui.freeipa.org/ipa/ui>
- b. Credentials: *admin* | *Secret123*

### 2. Access into the modern WebUI site

- a. [https://ipa.demo-modernui.freeipa.org/ipa/modern\\_ui](https://ipa.demo-modernui.freeipa.org/ipa/modern_ui)

# Modernizing the WebUI



# Future roadmap

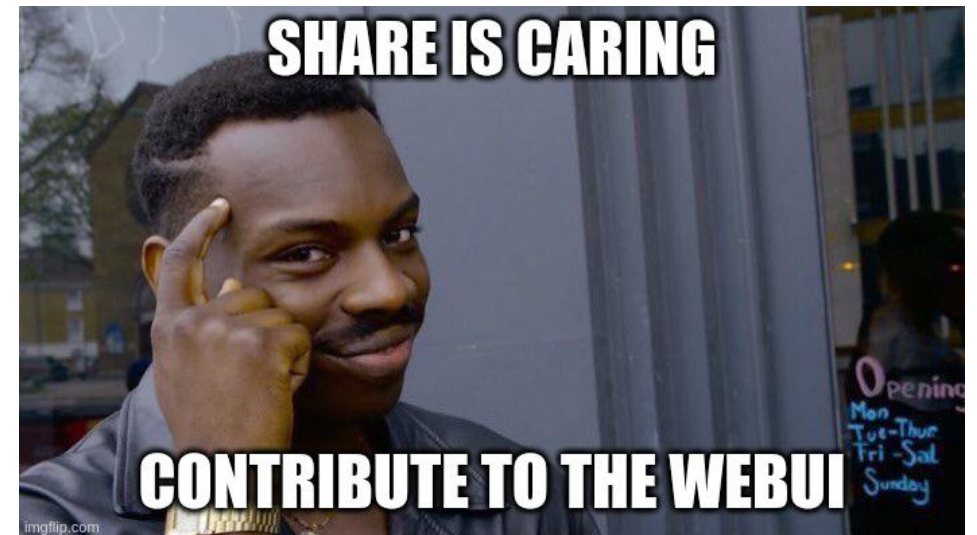
## What's next?

- ▶ Keep implementing new pages and functionality
- ▶ Improve routing → Adding direct links to pages
- ▶ Enhance potential performance issues with a lot of records
- ▶ Add internationalization (i18n) functionality
- ▶ Login page and authentication experience
- ▶ Adapt external plugins
- ▶ Engagement and more external collaboration

## Do you want to contribute?

Modern WebUI - [Upstream repository](#)

- ▶ Configure your [WebUI local instance](#)
- ▶ Check [issues](#)
- ▶ Open a [discussion](#) and don't hesitate to ask questions
- ▶ Enjoy learning!



# Q&A

## WebUI Main Contributors

Carla Martinez (Dev, [carlmart@redhat.com](mailto:carlmart@redhat.com))

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Thank you