Building a Web UI for the Fedora installer

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Reasons for a Web UI

Status Quo

About the Fedora installer.

- the Fedora installer is called Anaconda
  - a project with long history, going back to ~1999
- currently has a GTK3 GUI and a text based UI
- modular architecture
  - UI talks to a backend via DBus
- addon support
- capable of fully automated operation via kickstart
- used by Fedora & RHEL, CentOS and related distributions

Why Web UI ?

Issues of the current GTK3 GUI.

- UX issues that accumulated over time
- GUI uses outdated technology in places
  - GTK 3
  - hard dependency on X for keyboard switching
- inefficient and insecure remote access (VNC)
- co effective unit tests for the GUI
- clear trend for system management tooling migrating to Web UI
  - system-config tools usually went from GTK mini-apps to becoming Cockpit plugins

Why Web UI ?

A fresh start has many benefits.

- known UX issues can be addressed from the start
- easier to achieve consistency
- based on modern and widely used tools and libraries
  - much bigger developer/designer community when compared to native GUI toolkits
- secure and efficient remote access - with just a browser!
  - makes it possible to have headless installation images with full graphical (remote) UI

The tools and libraries

Under the hood

How does it actually work ?

Python backend <-> DBus <-> Cockpit <-> React/PatternFly

- the installation is controlled via a DBus interface
  - same as with current GTK3 GUI, TUI or kickstart installation
- Cockpit tooling exposes the DBus interface & general OS access to the Web UI
- the Web UI is built from PatternFly components and powered by React.js
- Web UI runs locally in a Web view or remotely in a browser

Test tooling

Making sure it works.

- using the the Cockpit test framework
- unit tests
  - interact with a running Web UI & simulate user interaction
  - written in Python, very similar to regular unit tests for Python code
- pixel tests
  - compare screen areas with reference images
  - powerful include/exclude support based on element id
  - indispensable for gating automated NPM dependency updates

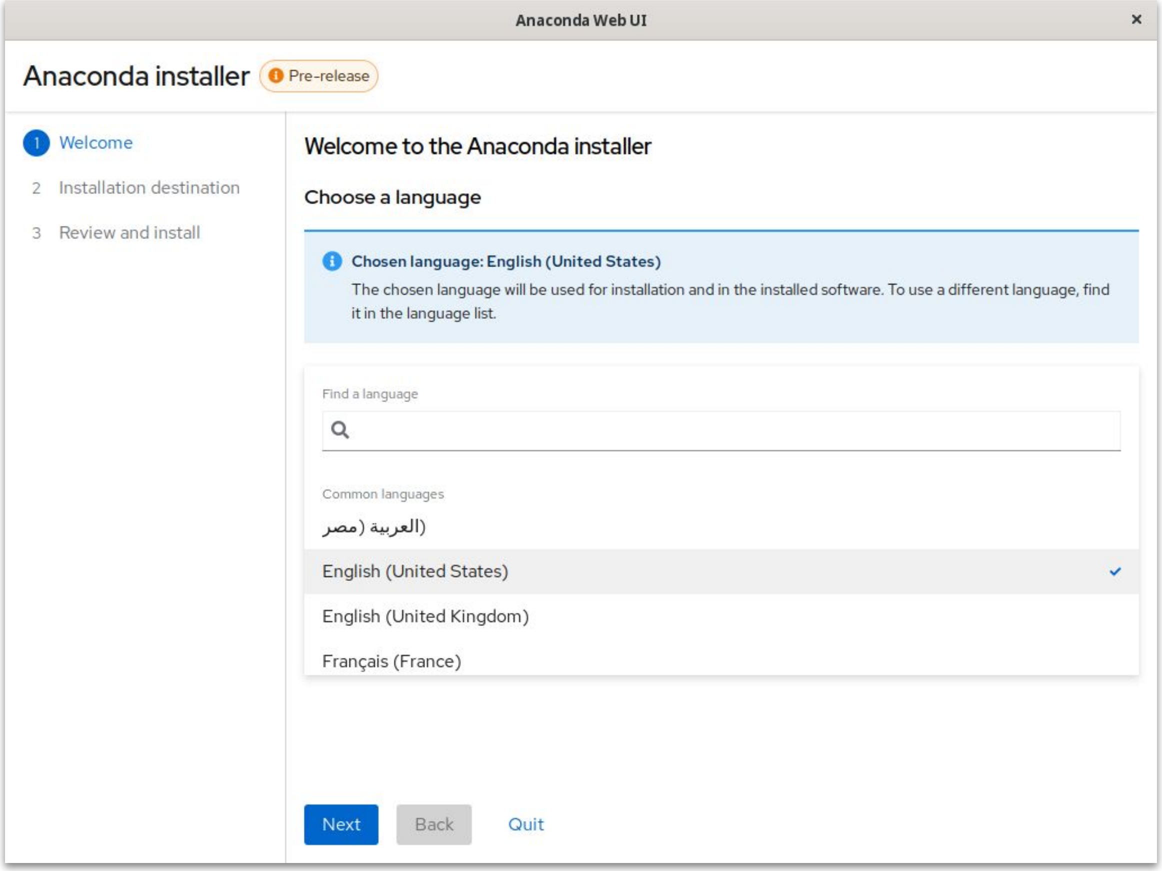
Progress so far

Minimal installation workflow

Just the bits needed to install a working system.

- installation + system language selection
  - pre-selected by geolocation
- disk selection
  - with runtime additional disk detection
- review screen
  - provides overview of what has been selected
- progress screen
  - at a glance + detailed installation progress reporting

Language selection screen



Welcome to the Anaconda installer

Choose a language

Chosen language: English (United States)
The chosen language will be used for installation and in the installed software. To use a different language, find it in the language list.

Find a language

Common languages

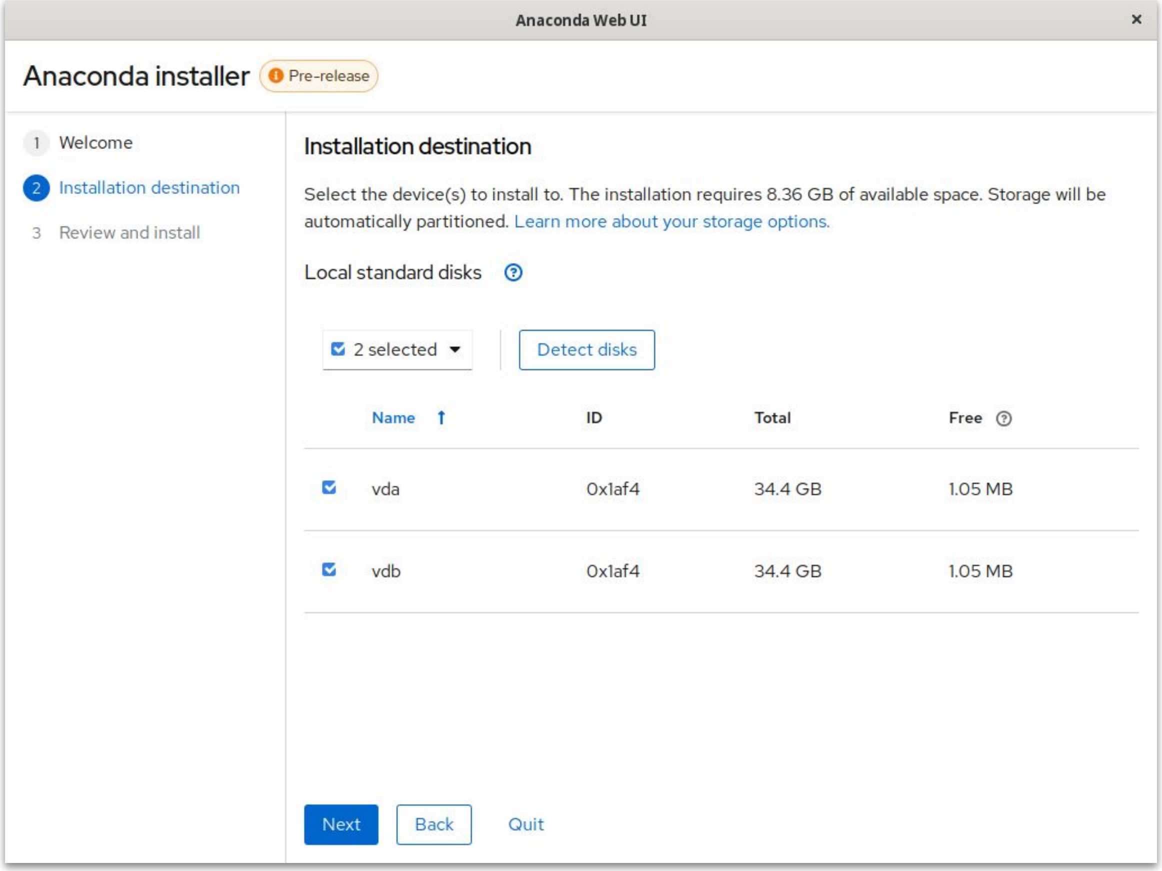
(العربية (مصر

English (United States) ✓

English (United Kingdom)

Français (France)

Disk selection screen



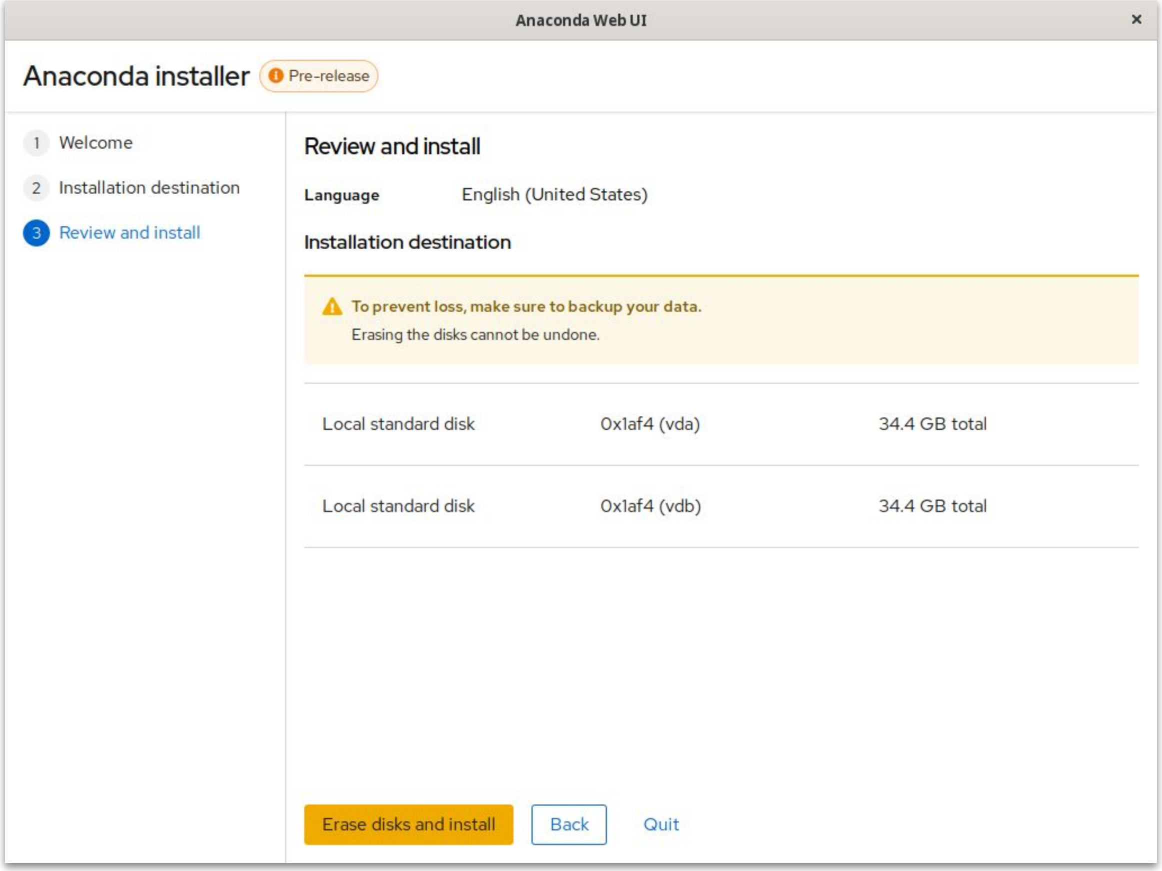
Installation destination

Select the device(s) to install to. The installation requires 8.36 GB of available space. Storage will be automatically partitioned. Learn more about your storage options.

Local standard disks

	Name ↑	ID	Total	Free
☑	vda	0x1af4	34.4 GB	1.05 MB
☑	vdb	0x1af4	34.4 GB	1.05 MB

Review screen



Review and install

Language English (United States)

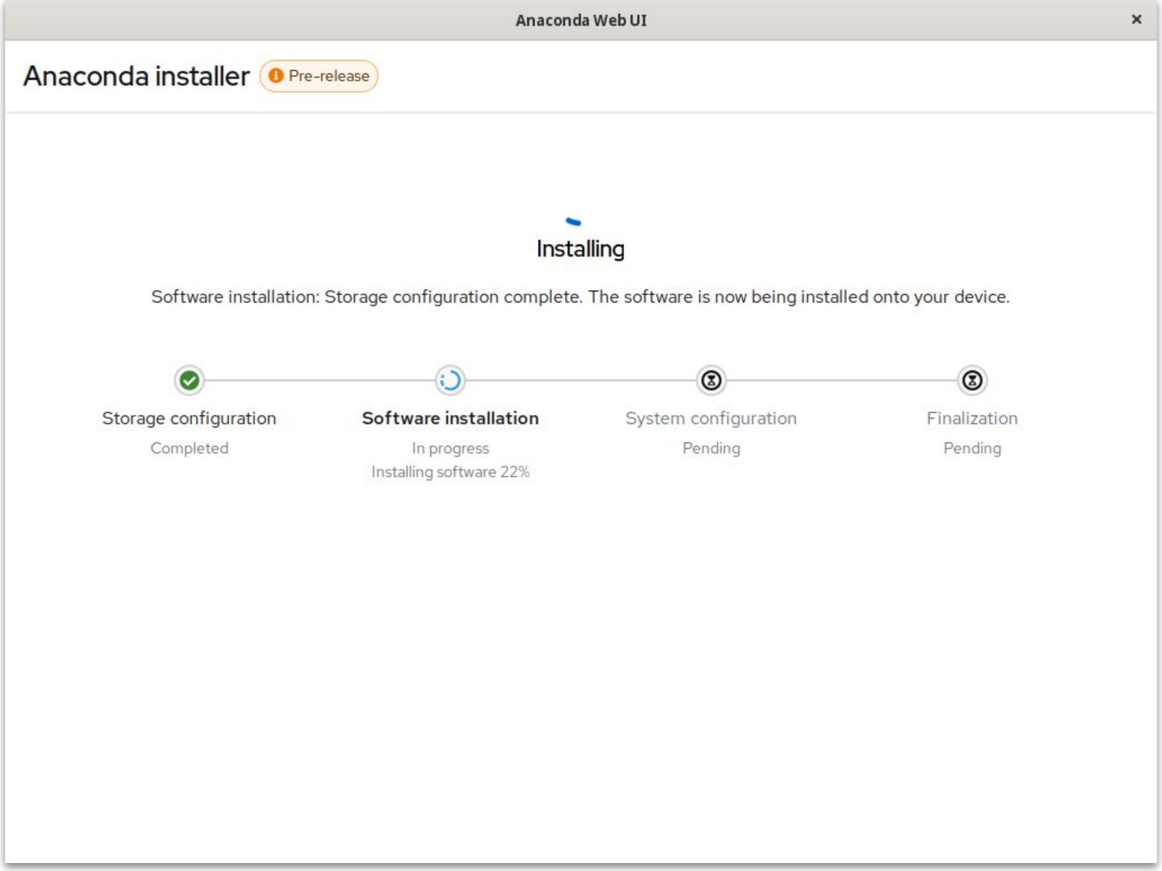
Installation destination

⚠ **To prevent loss, make sure to backup your data.**

Erasing the disks cannot be undone.

Local standard disk	0x1af4 (vda)	34.4 GB total
Local standard disk	0x1af4 (vdb)	34.4 GB total

Progress screen



Anaconda Web UI

Anaconda installer

Pre-release

Installing

Software installation: Storage configuration complete. The software is now being installed onto your device.

Storage configuration
Completed

Software installation
In progress
Installing software 22%

System configuration
Pending

Finalization
Pending

Anaconda Web UI preview

An unofficial image demonstrating the Web UI

- released after Fedora 37 finally went GA
- installs a minimal F37 system built from F37 content
- not an one-off release, the image will be updated with latest Web UI work in regular intervals
- main focus on the Web UI rather than installed system
- valuable source of feedback
- *want to give it a try ?*

https://fedorapeople.org/groups/anaconda/webui_preview_image/

https://fedoramagazine.org/anaconda-web-ui-preview-image-now-public

Challenges and issues

Building a new installer UI

Is quite an undertaking.

- huge amount of functionality in the current GUI
  - important to see what is import and what is actually not being used
- avoid past UX issues
- keeping things consistent
- what to implement first ?
- processing feedback

Running locally

Local Web UI display + minimal installation image.

- Web engines can bump image size and increase resource requirements
- tried GTK3 WebKit & Firefox so far
  - GTK3 WebKit is smaller and uses less RAM, worse performance with no acceleration
  - Firefox needs more space and more RAM, uniform performance
- headless image side-steps the issue

Running remotely

How to make remote connection easy & secure ?

- what address should the user connect to ?
  - address might be randomly assigned by DHCP
  - need to check the booted machine to ding the address
- how to secure the remote connection ?
  - regular SSL certificates can't be used due to the dynamic address
  - self signed certificate triggers a scary warning in most browsers & user needs to compare certificate fingerprint to avoid MitM

Next steps

Storage configuration

The most complex part of any OS installer.

- at the moment we plan to work on two main workflows
- guided partitioning
  - pre-configured storage configuration options
  - user picks one and is guided forward
- custom partitioning
  - manual bottom-up assembly of the storage layout by the user
- combination of both
  - complete a guided path
  - edit the result via custom partitioning

More screens

Not just storage.

- date and time configuration
- user and root account creation
- error reporting
- installation source
- software selection
- addons

Storage feedback!

Back to storage. ;-)

- we are trying to find out what storage options are important for users
- we put together a survey form
- https://redhatdg.co1.qualtrics.com/jfe/form/SV_87bPLycfp1ueko6
- closing soon, hurry up! :-)
- thanks!

Questions ?

"Problems only use Anaconda."

An ancient Bugzilla wisdom

Source: