DBus
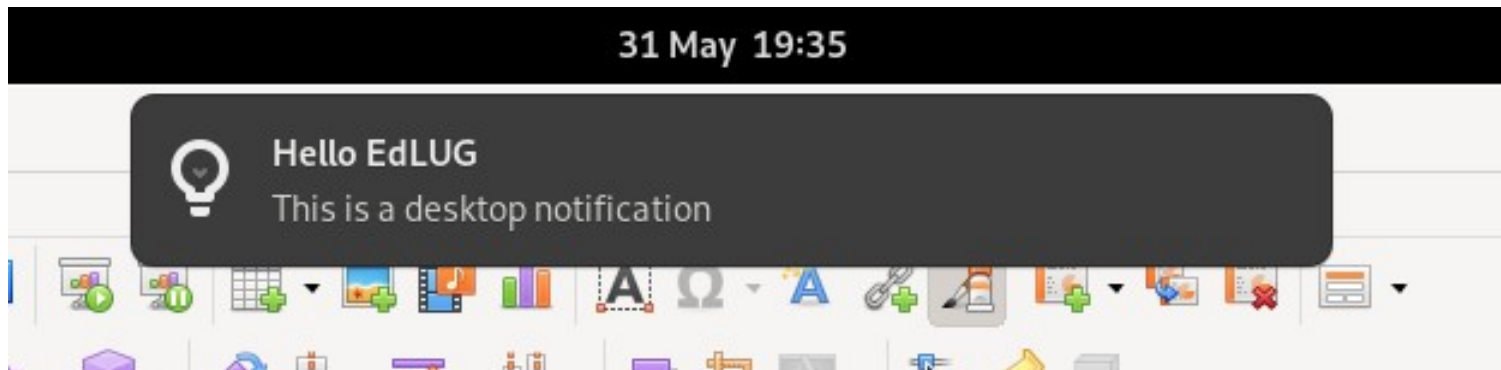## Communications for desktop apps

EdLUG, June 2021

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Desktop notifications

`org.freedesktop.Notifications`
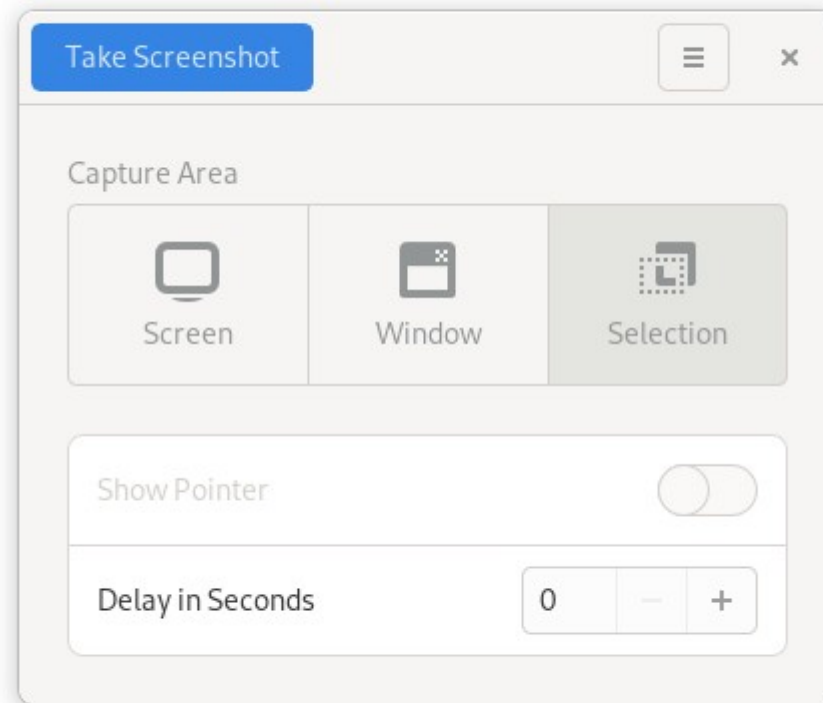
Screensaver

(or not)

```
org.freedesktop.ScreenSaver
org.gnome.ScreenSaver
```
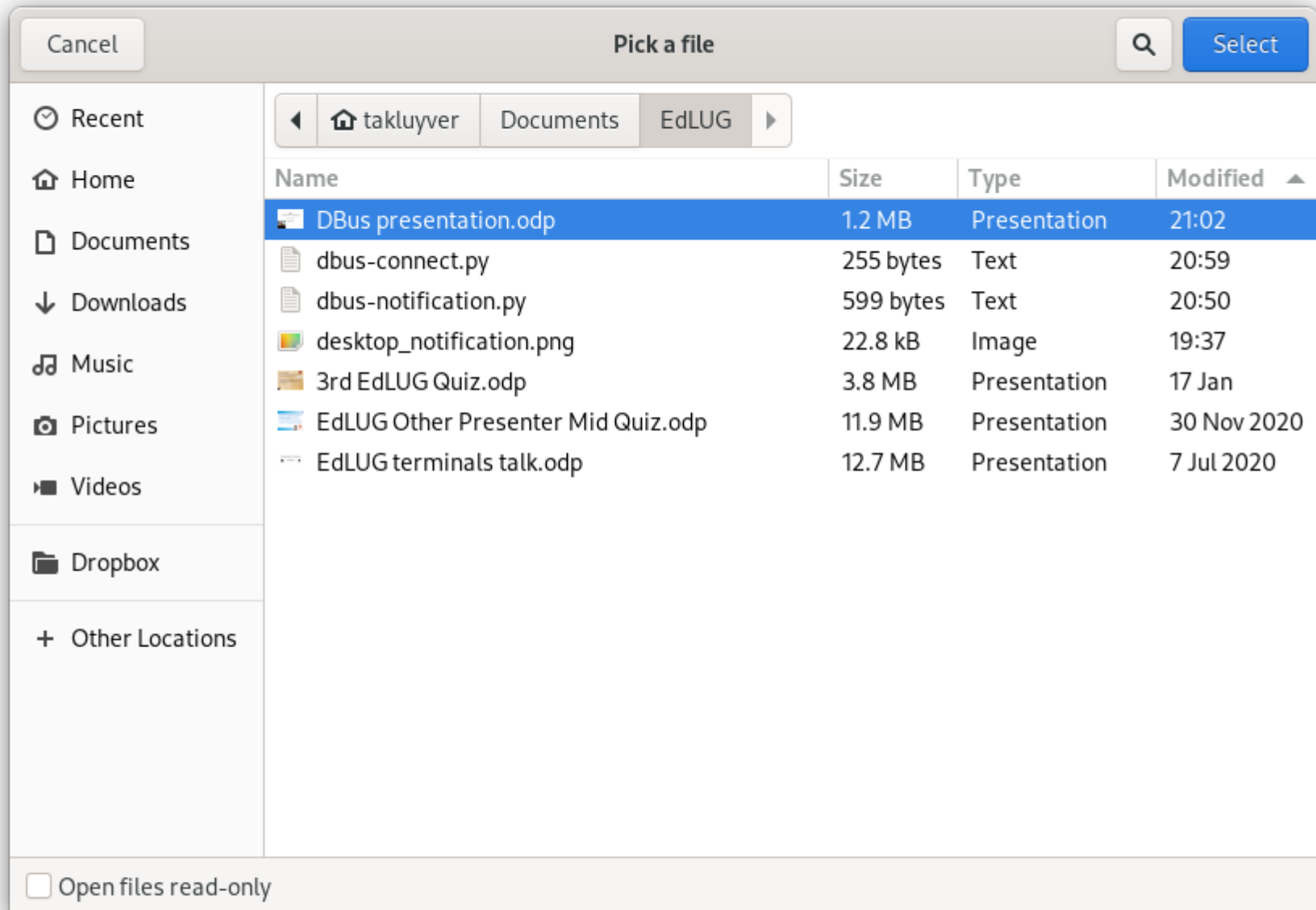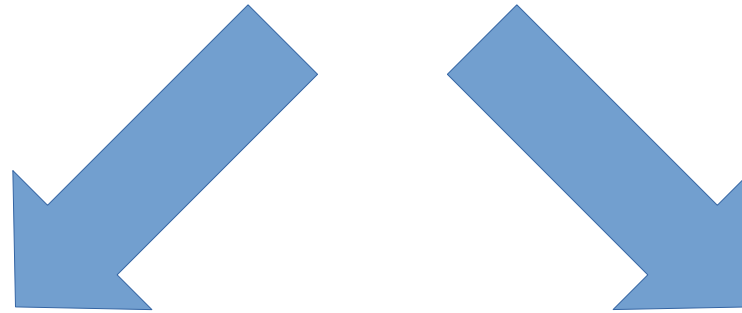
Screenshots

(on Wayland)

`org.gnome.Shell.Screenshot`

File picker

Is anyone there?

```
$ firefox https://edlug.gitlab.io/
```

Start a new browser

New tab in existing window

Send URL to browser process

```
org.mozilla.firefox.ZGVmYXVsdC1yZWxlYXNl
```

Profile name "default" in base64

How does this work?

- *Message bus*: central switchboard
  - Small program, always running
- Connect to the message bus
- Send messages addressed to a name
  - e.g. `org.freedesktop.Notifications`
- Claim your name (optional)
  - `RequestName` message to `org.freedesktop.DBus`
  - Name released if you disconnect

Communication patterns

- Method calls
  - One to one
  - Reply with result or error
- Signals
  - One to many
  - No reply
- Both can carry data
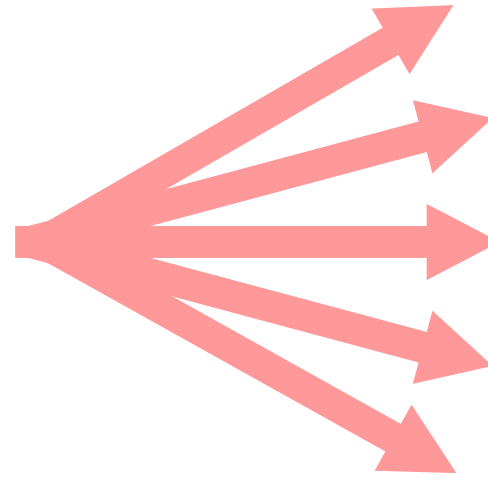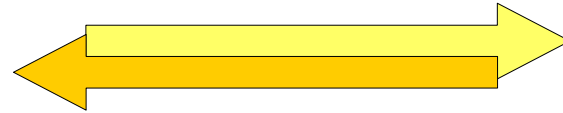
Naming stuff

- Well known names
  - `org.freedesktop.Notifications`

- Object paths
  - `/org/freedesktop/Notifications`

- Interfaces
  - `org.freedesktop.Notifications`
  - Group of methods and signals
  - Most things have a main interface + a few standard
    - e.g. `org.freedesktop.DBus.Introspectable`

Service activation

- Use a file to claim a name
- Start program when needed
- Less memory used!

e.g. `com.feralinteractive.GameMode`

`/usr/share/dbus-1/services/`
`com.feralinteractive.GameMode.service`

Talking to DBus

- Unix sockets
  - Like network sockets, but within computer

- On my system:
  - Session bus: `/run/user/1000/bus`
  - System bus: `/run/dbus/system_bus_socket`

- Authenticated with user ID

- Normally use `libdbus`

Demo

D-Feet

Bustle
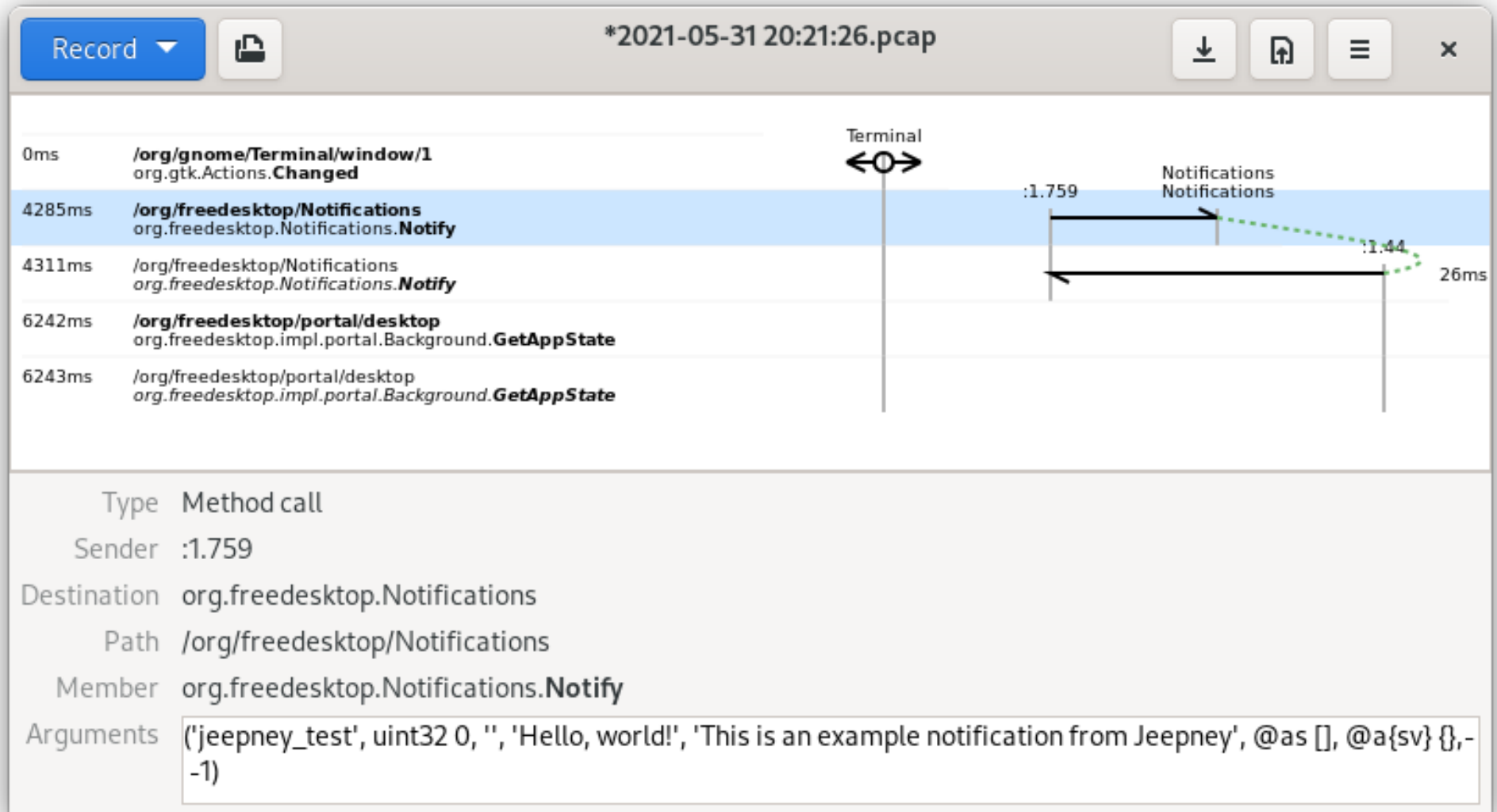
End

Questions?

D-Bus overview: https://www.freedesktop.org/wiki/IntroductionToDBus/
D-Bus specification: https://dbus.freedesktop.org/doc/dbus-specification.html

Is anyone there (other options)?

e.g. if Browser running, open a new tab

- Named pipe / Unix socket
  - Not cleaned up if process crashes
- Well known port
  - Only 65536 ports
- PID file
  - PIDs can be reused
  - Signals carry little information