



# **Beyond the Matrix**

**Extend the capabilities of your Synapse homeserver**

a.k.a. “Modules go brrr”

# Who am I?

**Brendan Abolivier**

babolivier@matrix.org

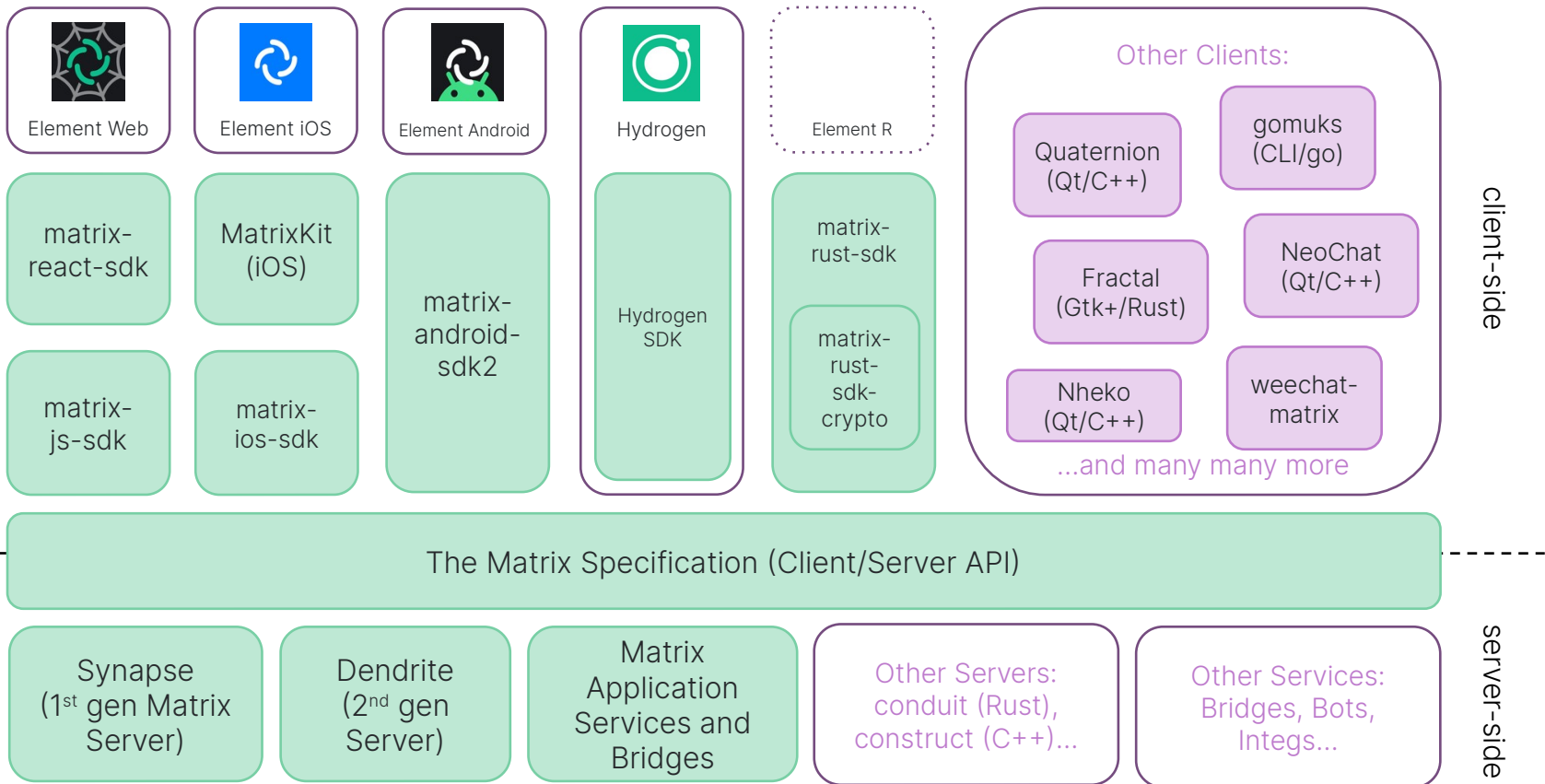
@babolivier:element.io

Software developer at Element  
Core committer on Synapse



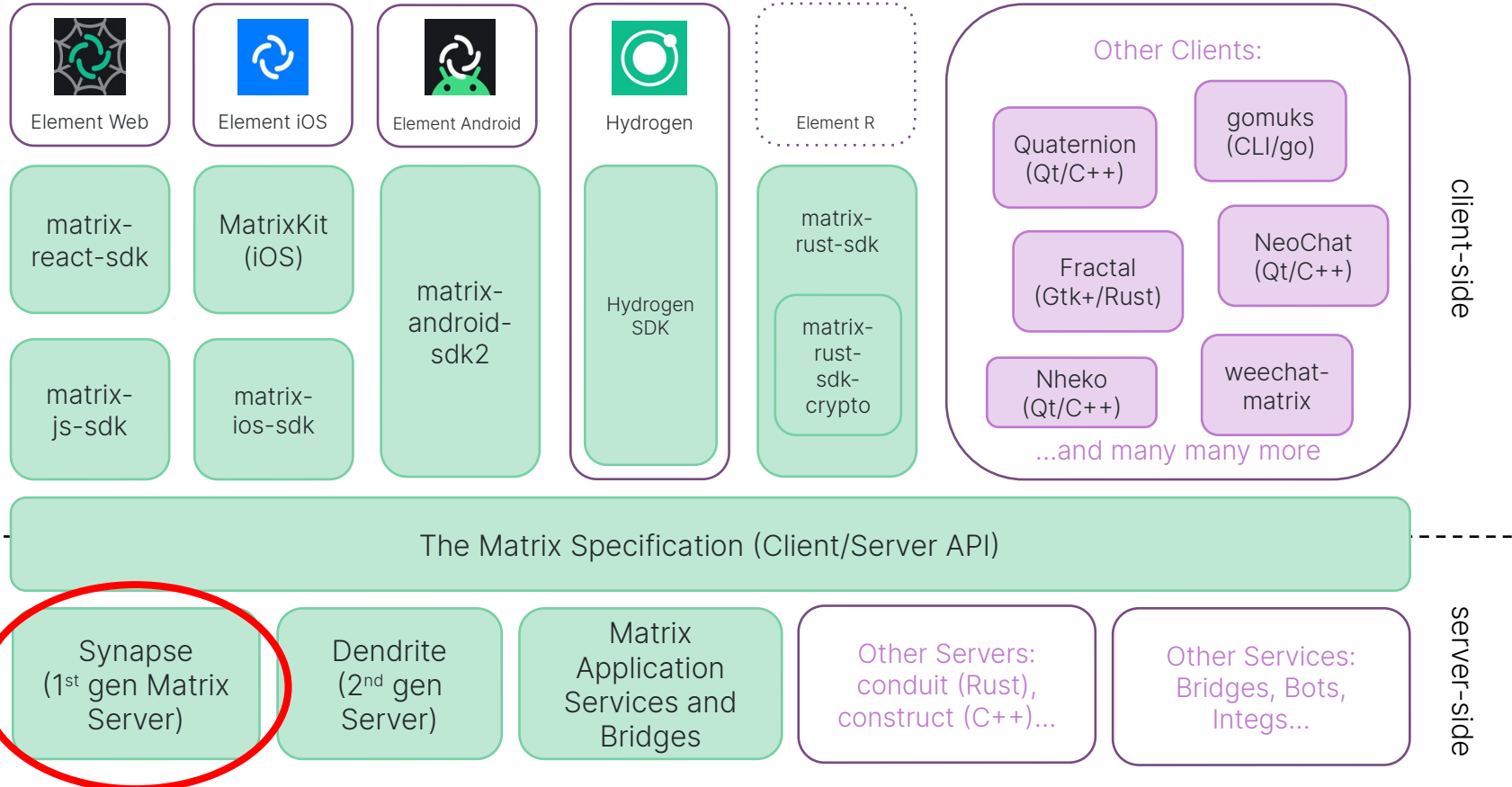
# What is Synapse?

[matrix]



# What is Synapse?

[matrix]



# What is Synapse?

- Main Matrix homeserver implementation
- Written in Python
- Maintained by the Matrix.org Foundation

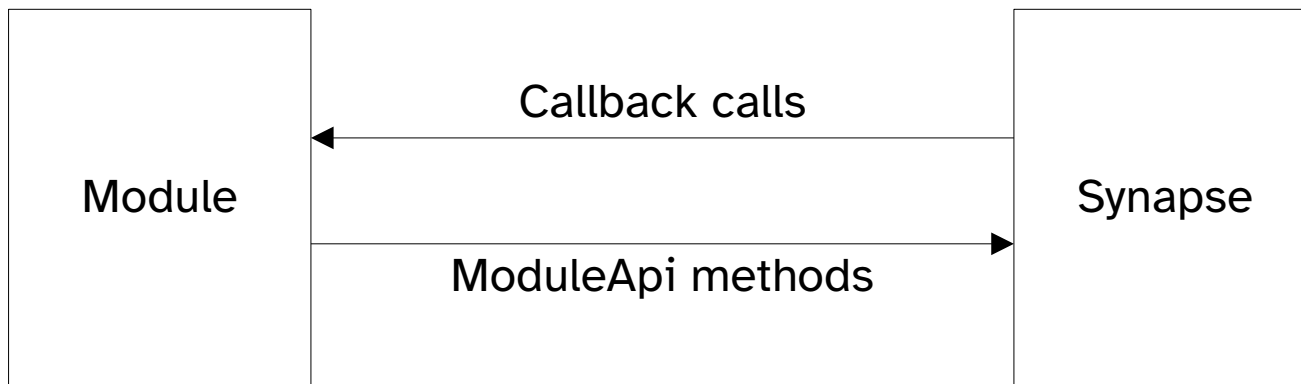
# Modules

Modules add **extra features** to Synapse, which are either **implementation-specific** or don't fit in the Matrix spec, or need more **flexibility** than config options.

e.g. spam checkers, authentication providers...

# Modules

A module is a **Python class**, which registers **callback functions** for Synapse to call on specific **operations**, and can **interact with Synapse** using the **ModuleApi** class.



# How to write a module

Resources for writing a Synapse module:

- List of callbacks with documentation and examples
- Cookiecutter template for modules
- ModuleApi class with docstrings

All are linked to from the talk's page on fosdem.org



# Let's write a module!

Let's write a **simple module** that changes a **room's avatar** to reflect the **last person** who sent a message into it.

To do this, we'll use:

- `on_new_event`: callback called by Synapse on every new event
- `create_and_send_event_into_room`: ModuleApi method to send an event into a room

# The module system

- Introduced around **2017** to help with **custom authentication backends**
- Used a lot for **spam checking** (e.g. Mjöltnir)
- Previously modules were split in **several types** with different ways to configure them with Synapse
- Rewrite started in 2021 to **standardise** the system into a single interface
- **Most module types** now migrated to the new system

# What's next?

- Migrating the **remaining interfaces** to the new system (#10469)
  - Media storage providers
  - SSO mapping providers
- Document the **ModuleApi** class in Synapse's documentation (#10687)
- Deprecate and remove the **legacy interfaces**
- Deprecate and remove **duplicate** callbacks
- **Sanbox** modules so they can't access Synapse's internals
- ...

**matrix**

**Thank You! Any question?**

babolivier@matrix.org  
@babolivier:element.io