

Standalone Matrix-based apps using the Widget API

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the
matrix
conference



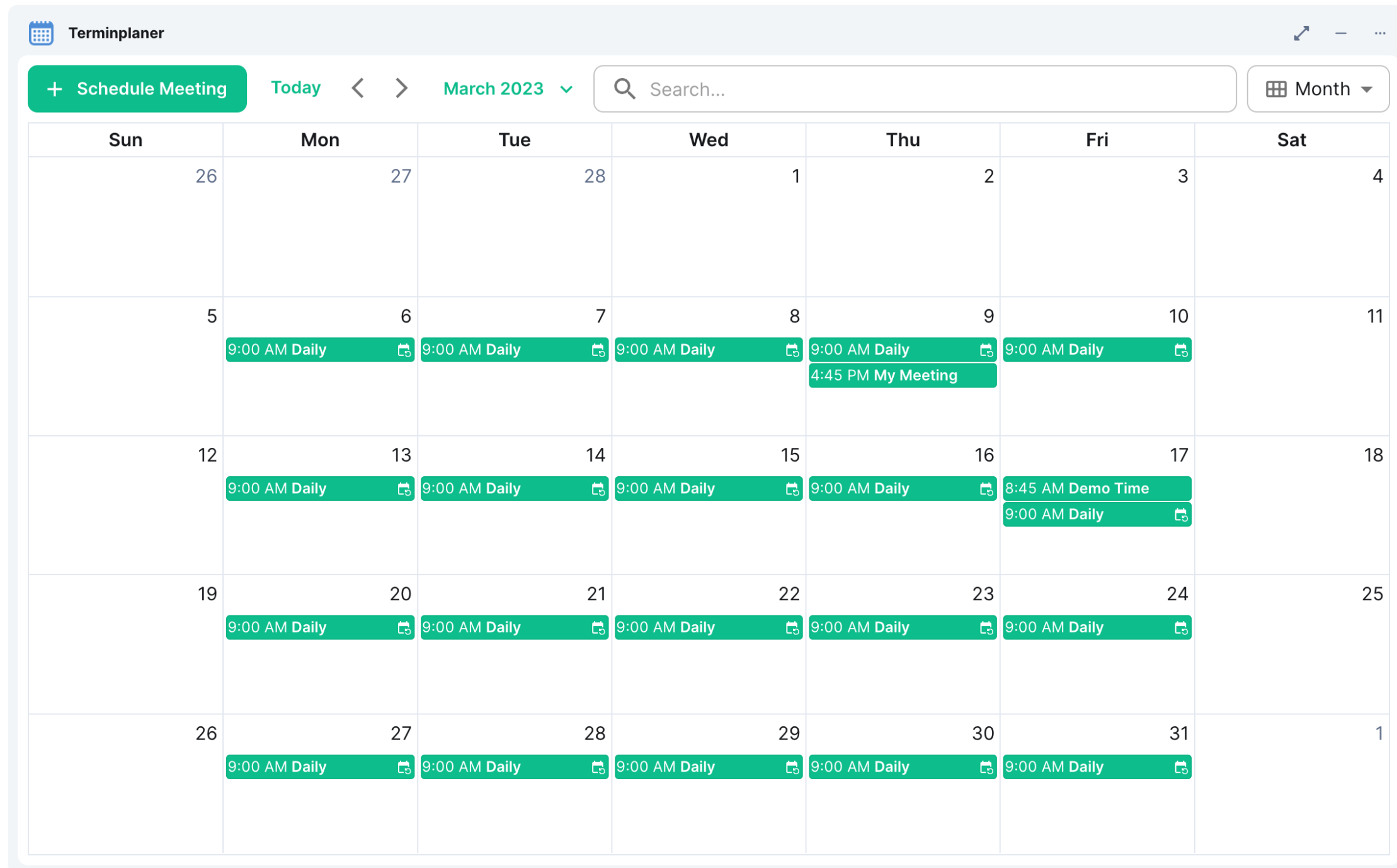
Berlin, 19th-22nd September 2024

We will take a look
at code and spec
documents!



- Demos
- How widgets work
- Matrix Widget Toolkit
- Standalone clients

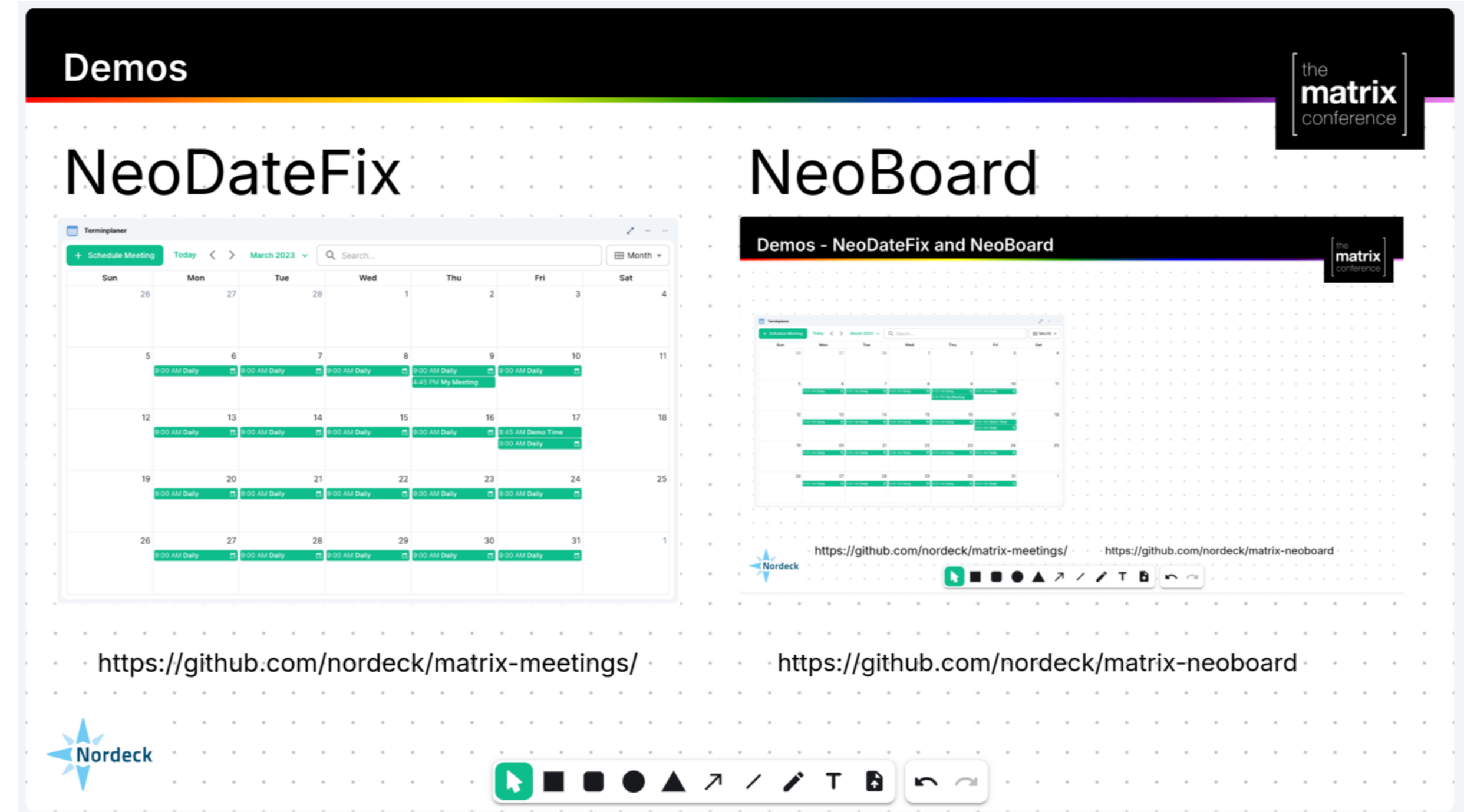
NeoDateFix



<https://github.com/nordeck/matrix-meetings/>



NeoBoard



<https://github.com/nordeck/matrix-neoboard>

Terminplaner

+ Schedule Meeting Today < > March 2023 Search... Month

Sun	Mon	Tue	Wed	Thu	Fri	Sat
26	27	28	1	2	3	4
5	6 9:00 AM Daily	7 9:00 AM Daily	8 9:00 AM Daily	9 9:00 AM Daily 4:45 PM My Meeting	10 9:00 AM Daily	11
12 9:00 AM Daily	13 9:00 AM Daily	14 9:00 AM Daily	15 9:00 AM Daily	16 9:00 AM Daily	17 8:45 AM Demo Time 9:00 AM Daily	18
19 9:00 AM Daily	20 9:00 AM Daily	21 9:00 AM Daily	22 9:00 AM Daily	23 9:00 AM Daily	24 9:00 AM Daily	25
26 9:00 AM Daily	27 9:00 AM Daily	28 9:00 AM Daily	29 9:00 AM Daily	30 9:00 AM Daily	31 9:00 AM Daily	1

Schedule Meeting

Data on this screen is shared with meetings-widget.dpx-nordeck.at-univention.de

Title (required)
Daily

Start date
03/21/2023

Start time
09:45 AM

End date
03/21/2023

End time
10:45 AM

Description

Widgets

- Videokonferenz
- Notizen
- Whiteboard
- Abstimmungsgruppen
- Abstimmungen
- Whiteboard (Prototyp)

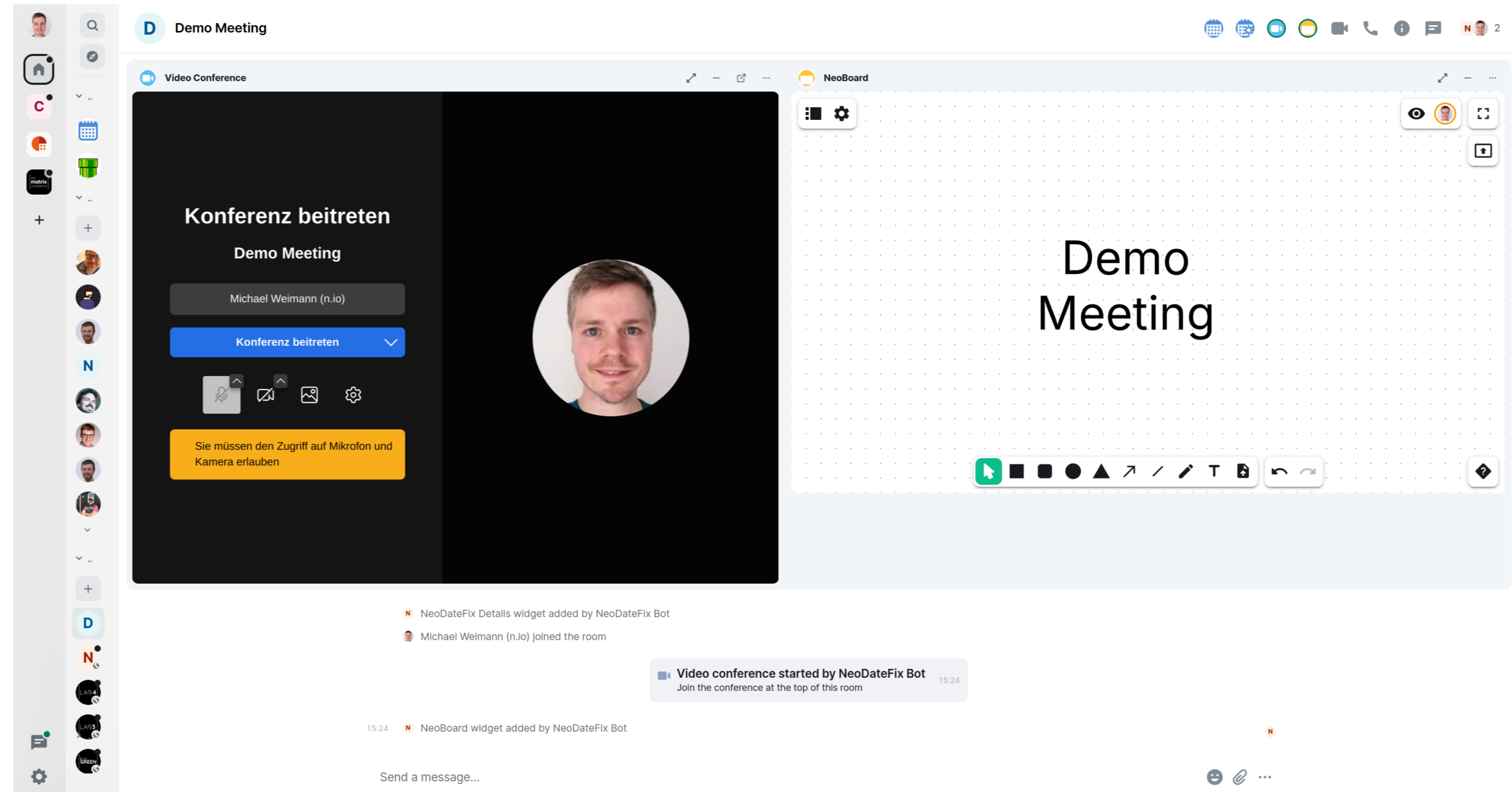
Repeat meeting
Every weekday

End of the recurring meeting

Cancel Create Meeting

<https://github.com/nordeck/matrix-meetings/>

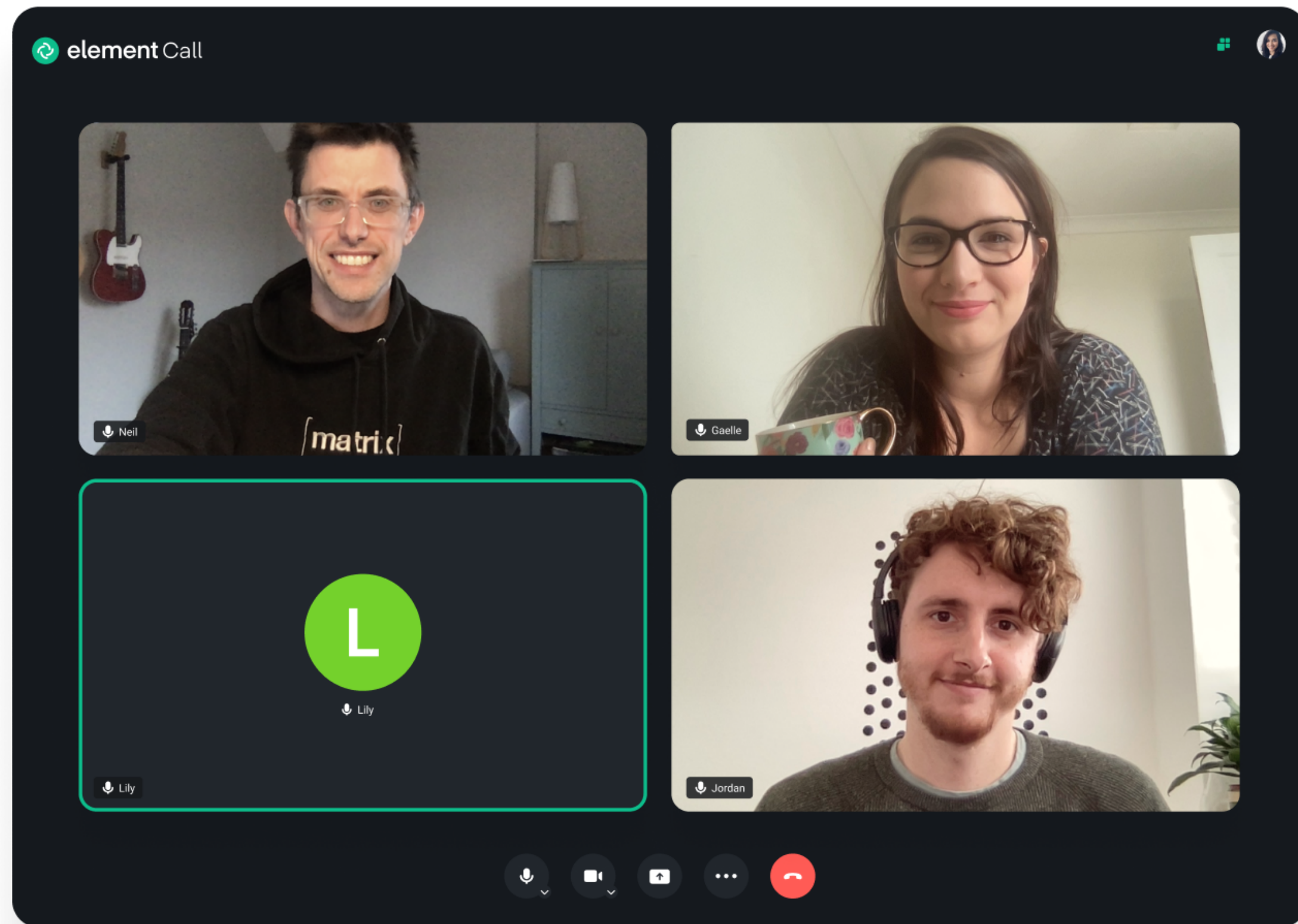
- Calendar view with planned events
- Schedule events
 - Attendees
 - Widgets
- Creates a room
 - Invites people
 - Sets up widgets



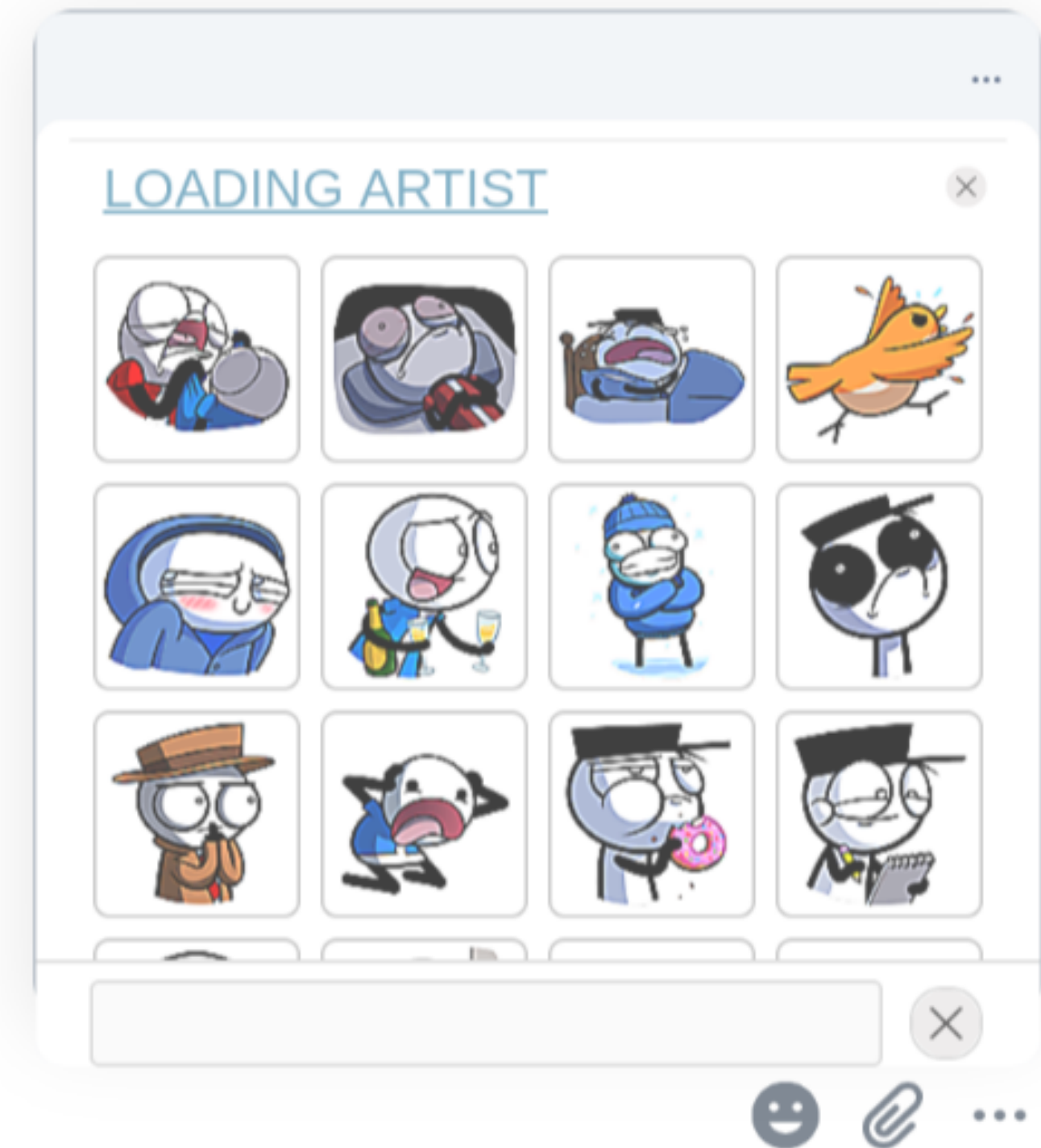
NeoDateFix can even do more

- Recurring Meetings
- Breakout rooms
- Clean up after meetings
- Rest API (to manage meetings)

Element Call



Stickers

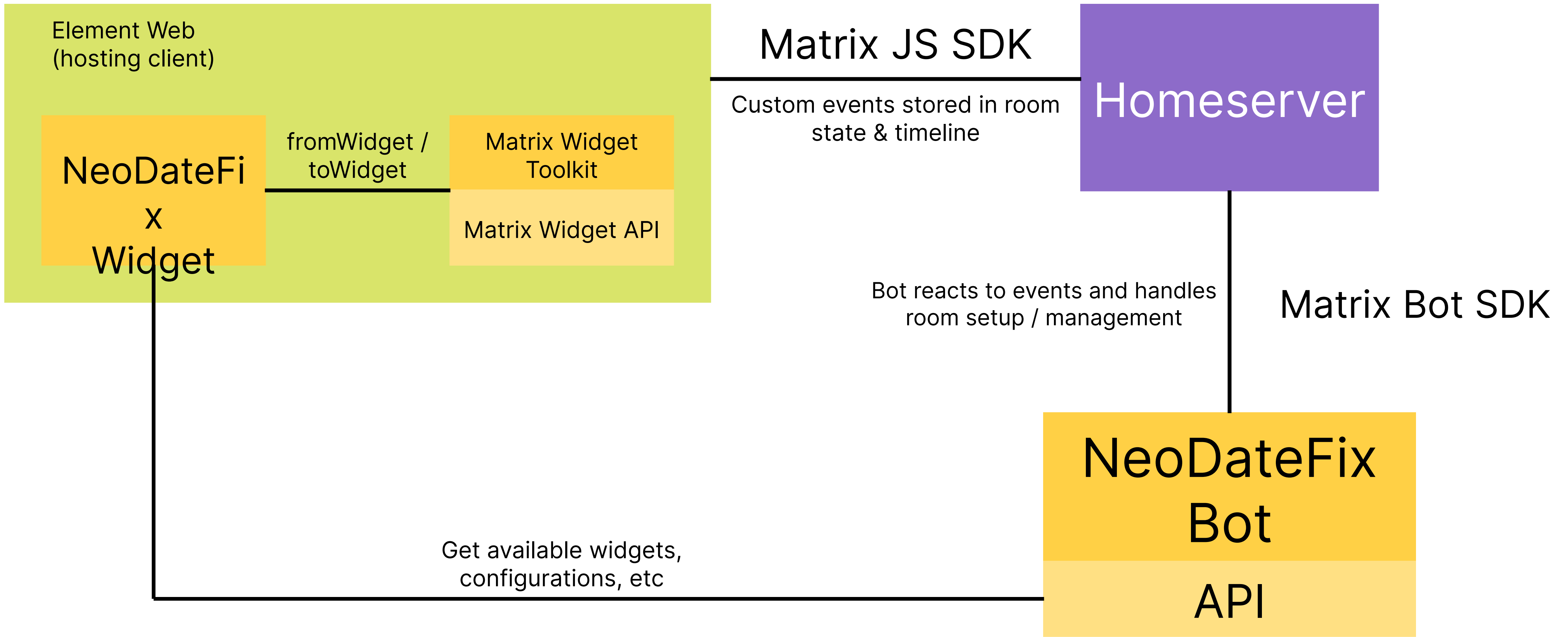


Room widgets

- Per room widgets
 - Stored in room state (m.widget)
- u2022 Examples: NeoBoard, Jitsi, Element Call

Account widgets

- Per account widgets
 - Stored in account data (m.widgets)
- u2022 Examples: Stickers

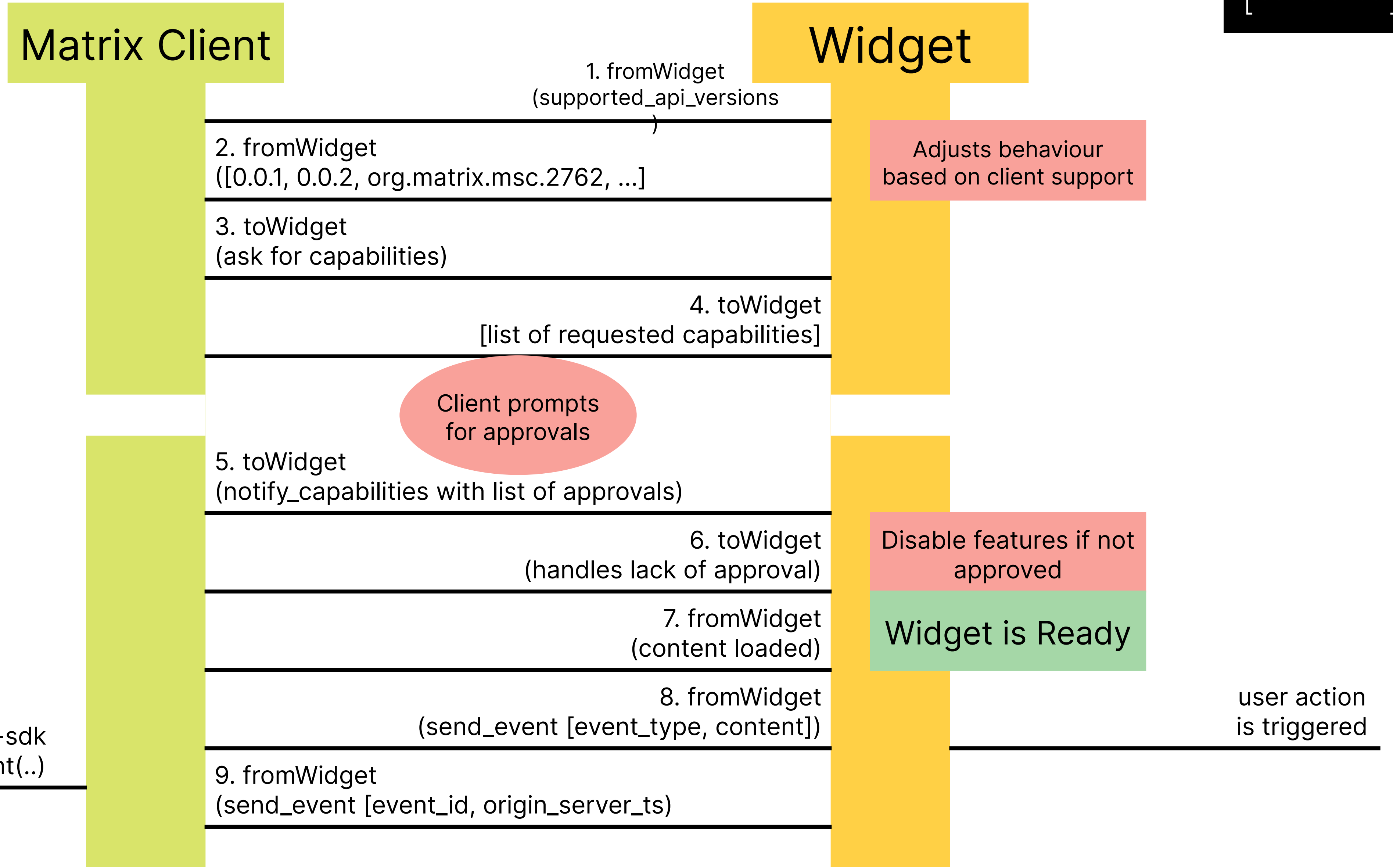


Request

```
{
  "api": "fromWidget",
  "requestId": "request123",
  "action": "send_event",
  "widgetId": "widget123",
  "data": {
    "type": "m.room.message",
    "content": {
      "msgtype": "m.text",
      "body": "Hello"
    }
  }
}
```

Response

```
{
  "api": "fromWidget",
  "requestId": "request123",
  "action": "send_event",
  "widgetId": "widget123",
  "data": {
    "type": "m.room.message",
    "content": {
      "msgtype": "m.text",
      "body": "Hello"
    }
  },
  "response": {
    "event_id": "$ONkHkXBMX..."
  }
}
```

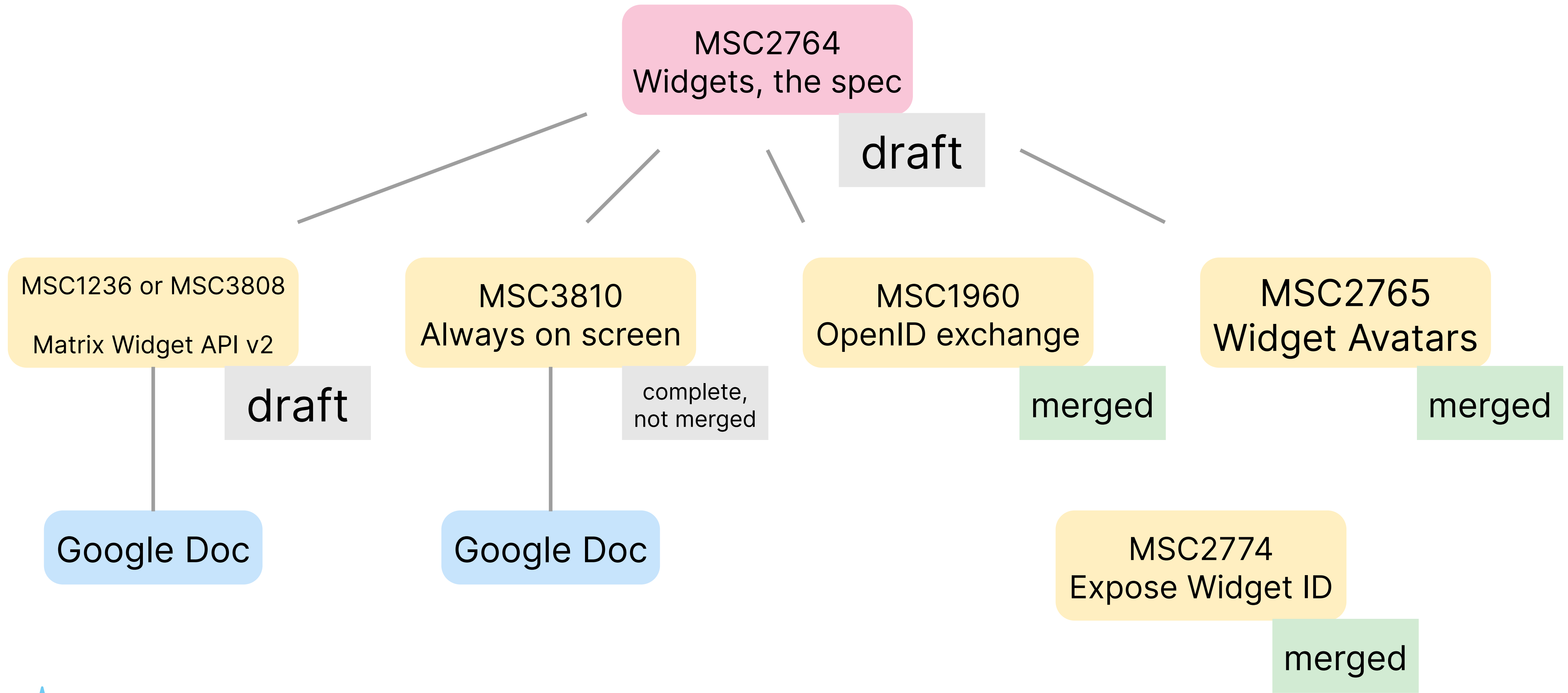


MSC2764
Widgets, the
spec

- Links to other MSCs
- Proposes a plan to get Widgets into the spec

Widgets,
the book

- Guide to Widgets implementation
- Not an MSC



More MSCs around widgets

MSC4039

Access content repo

MSC3973

User directory

MSC3869

Event relations

MSC3846

TURN servers

MSC3819

To-device messages

MSC2873

Settings (lang, theme...)

MSC2762

Send/receive events

MSC4157

Delayed events

MSC3751

Read account data

MSC2931

Navigate matrix.to URLs

Without implementation / drafts

MSC3817

Create rooms

MSC3008

Scoped access

MSC2192

Inline widgets

MSC2790


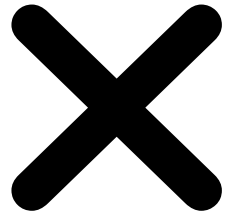
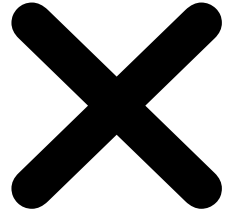
Modal widgets

MSC4039

Access content repo

<https://github.com/nordeck/matrix-spec-proposals/blob/nic/feat/widgetapi-upload-files/proposals/4039-widget-api-media.md>

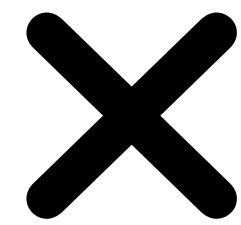
Client Support

Web		Full support
Mobile		Only web views loading the page, effectively unusable
X		Only for Element Call



Same for Bundes-
Messenger and other forks

Other clients



Most likely - no support

Convenience helpers to create widgets

- Ease of use API with RxJS
- Themed MUI components
- React integration
- Widget server image

<https://github.com/nordeck/matrix-widget-toolkit/>

Willkommen

Example on widget parameters

Identity

Example on using the OIDC token to check the user's identity

Dice

Example on how room events are send and processed

Room Admin Tool

Example on how state events are processed

All Rooms

Example on how to access events from a different room

Modal

Example on how models are opened

Power Levels (Redux)

Example on how to interact with redux

Event relations

Example on how to read related events

Examples demo

```
const widgetApiPromise = WidgetApiImpl.create({
  // You can specify which capabilities should be requested at startup. One
  // can also request capabilities after the application started.
  capabilities: [
    WidgetEventCapability.forStateEvent(
      EventDirection.Send,
      PLANNING_POKER_ROUND_EVENT,
    ),
    WidgetEventCapability.forStateEvent(
      EventDirection.Receive,
      PLANNING_POKER_ROUND_EVENT,
    ),
    WidgetEventCapability.forRoomEvent(
      EventDirection.Send,
      PLANNING_POKER_CARD_EVENT,
    ),
    WidgetEventCapability.forRoomEvent(
      EventDirection.Receive,
      PLANNING_POKER_CARD_EVENT,
    ),
  ],
});
```

Create Widget API

```
export const App: React.FC<AppParams> = ({ widgetApiPromise }) => {
  return (
    <MuiThemeProvider>
      <Suspense fallback={<></>}>
        <MuiWidgetApiProvider
          widgetApiPromise={widgetApiPromise}
          widgetRegistration={{
            name: "Planning Poker",
            type: "info.weeman.planning_poker",
          }}
        >
          <Box sx={{ padding: "8px" }}>
            <PlanningPoker />
          </Box>
        </MuiWidgetApiProvider>
      </Suspense>
    </MuiThemeProvider>
  );
};
```

API provider

```
useEffect(() => {
  setDices([]);

  const subscription = widgetApi
    .observeRoomEvents(STATE_EVENT_THROW_DICE)
    .pipe(
      filter(isValidThrowDiceEvent),
      map((r) => r.content.pips),
    )
    .subscribe((d) => {
      setDices((l) => [...l, d]);
    });

  return () => {
    subscription.unsubscribe();
  };
}, [widgetApi]);
```

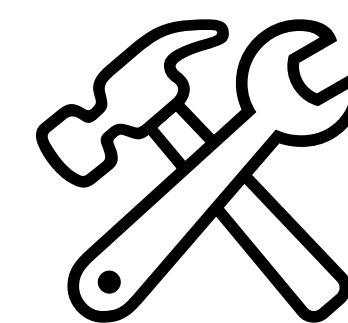
React hook using RxJS to subscribe to the Widget API

<https://github.com/nordeck/matrix-widget-toolkit/blob/main/example-widget-mui/src/DicePage/DicePage.tsx>

Want to try it yourself?



Join the workshop
right after this
talk!



Element Web

Widget App

WidgetApiProvider

ThemeProvider

CapabilitiesGuard

matrix-widget-toolkit

observe /
publish events

Widget API client
Implementation

matrix-widget-api interface

fromWidget
toWidget

Matrix Client
Widget Driver

matrix-widget-api interface

event filtering

widget layout

widget state

matrix-
js-sdk

homeserver

@matrix-widget-toolkit/

@matrix-
widget-toolkit/ + @matrix-
react widget-toolkit/
mui

@matrix-widget-toolkit/
testing

+

widget server

—————
RxJS-based Widget API implementation that any widget app can use. Simplifies widget registration, capabilities negotiation and assorted helper functions to streamline development.

—————
Framework-specific components for developing React based apps with a MUI design language.

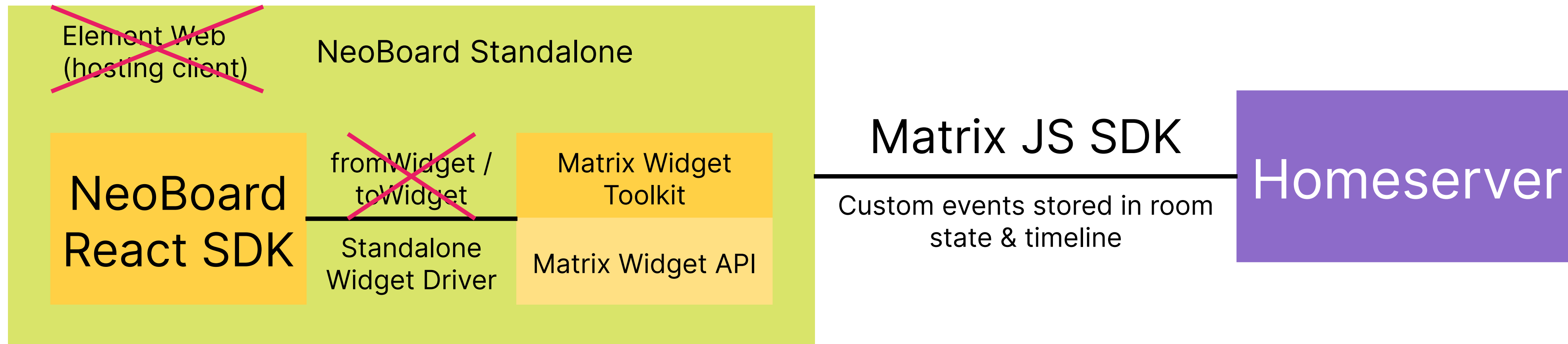
{Mui}WidgetApiProvider -> Makes the Widget API available to React components

{Mui}ThemeProvider -> Custom theme with dark / light mode support

{Mui}CapabilitiesGuard -> Only renders the widget content if requested caps are satisfied

—————
A mocked Widget API implementation that you can use in your app's unit tests.

—————
An alpine based image ready to deploy Widgets SPAs using NGINX, with required configurations (CSP, Cache Control headers, etc).



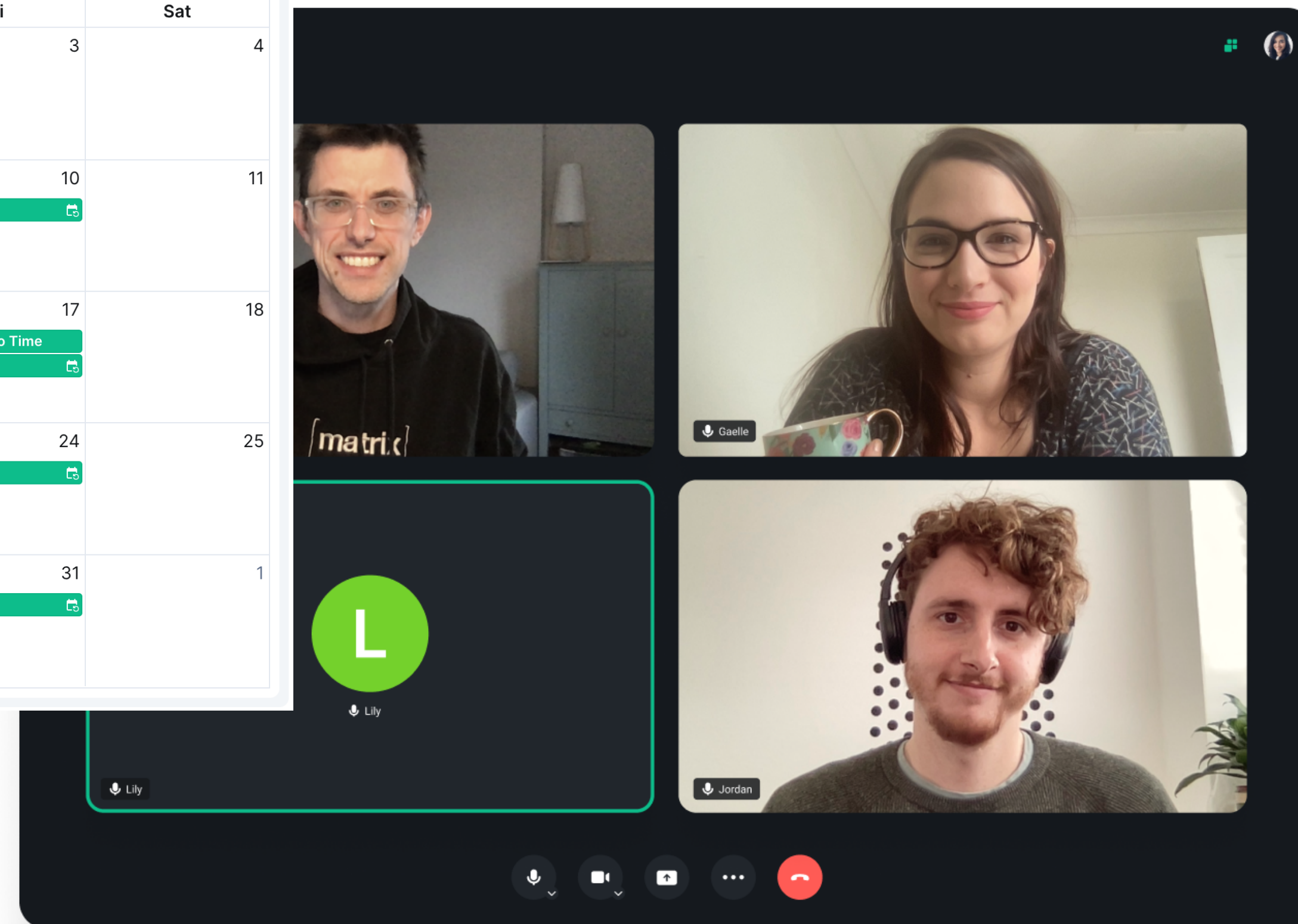
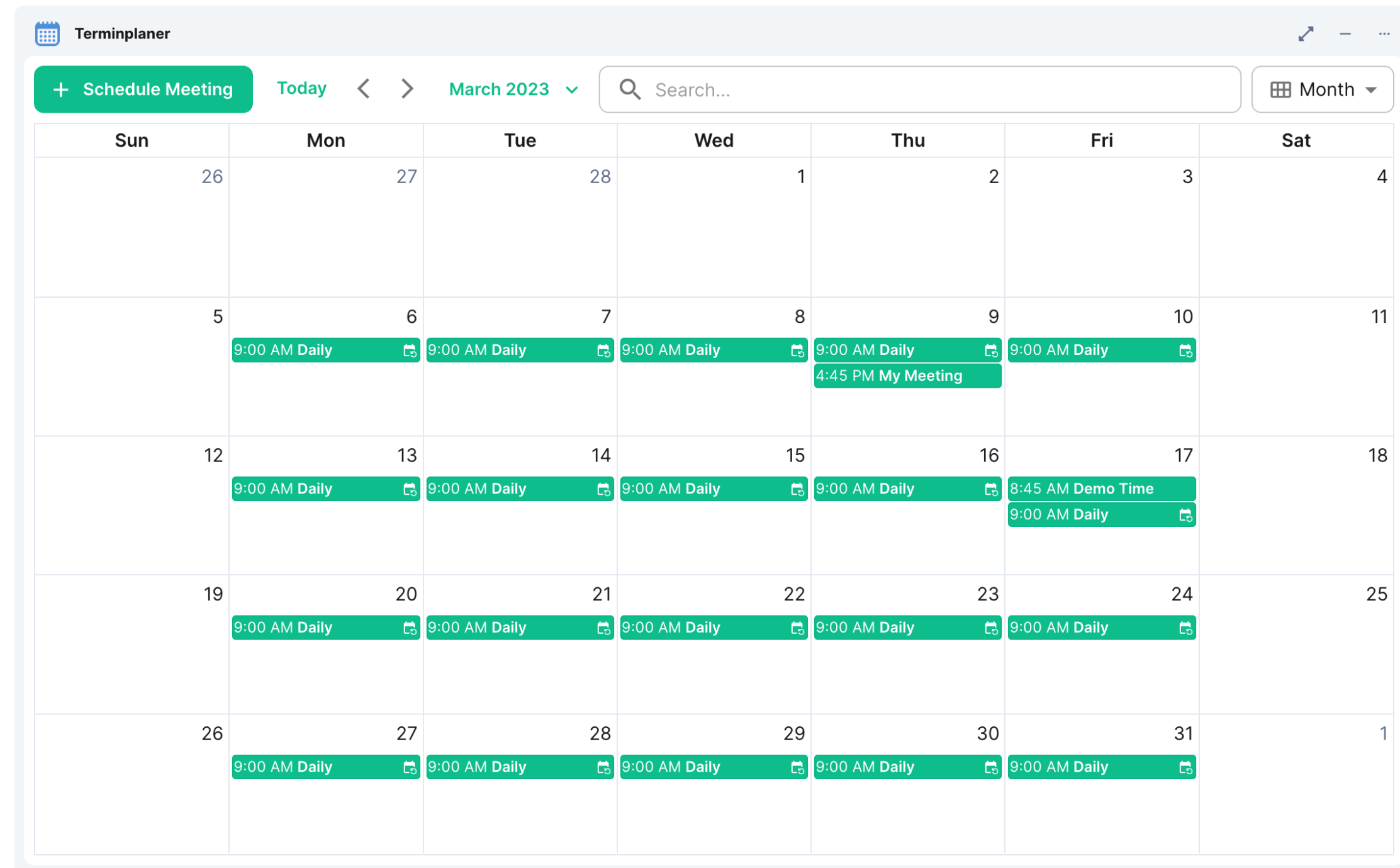
- Hybrid widgets for free™
 - Works in a Matrix Client
 - An on it's own
- Improved development workflow
 - No need to wrap the widget with a client
- Go beyond widget API
 - Use all Matrix and other APIs



- Inconsistent feature set
 - Widget vs. standalone
- New sessions
 - A standalone widget needs it's own session
 - Inconvenient crypto setup



Widgets can be a powerful way to extend Matrix...



...however

Unclear MSC
state

?

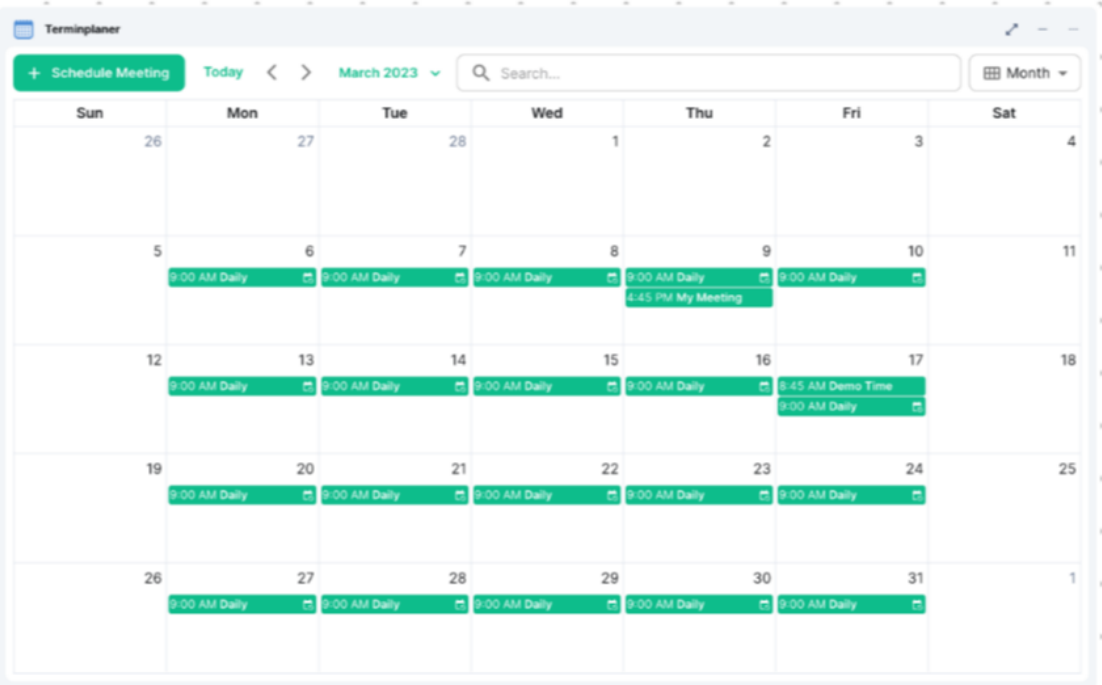
Limited client
support

Standalone clients

Demos

the matrix conference

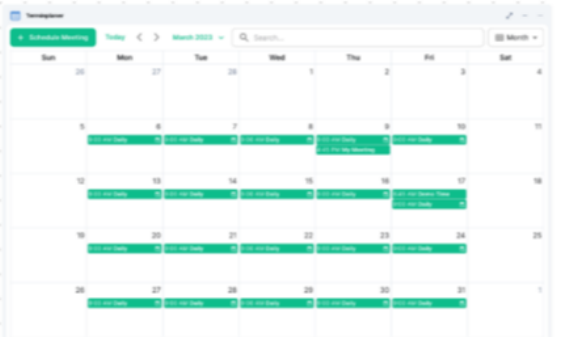
NeoDateFix



<https://github.com/nordeck/matrix-meetings/>

NeoBoard

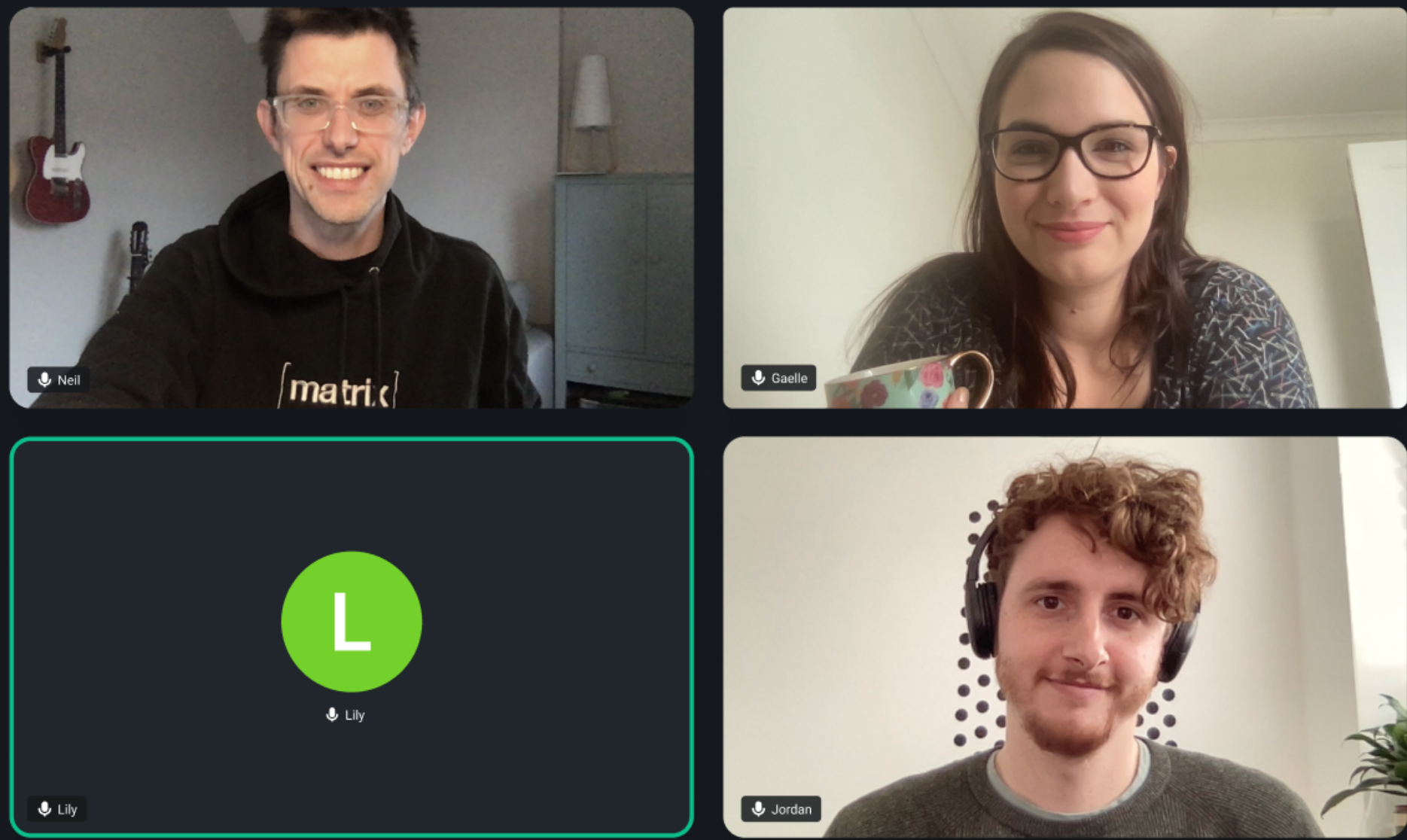
Demos - NeoDateFix and NeoBoard



<https://github.com/nordeck/matrix-meetings/> <https://github.com/nordeck/matrix-neoboard>

Nordeck

element Call



Neil

Gaelle

Lily

Jordan

Wishlist

Stabilise the
spec

- Tidy up MSCs
- Reflect current implementations

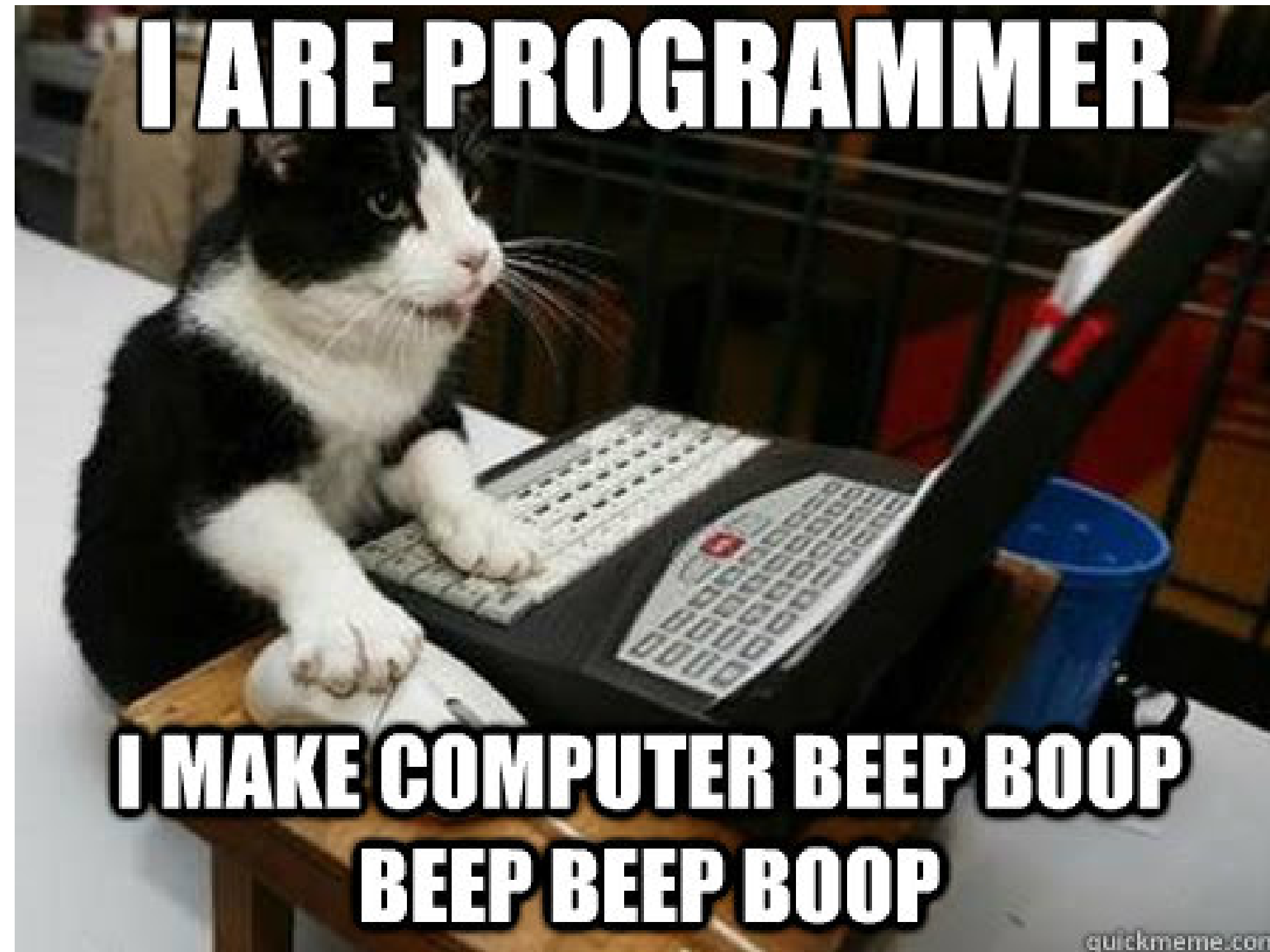
Extend the
spec

- Inline widgets
- Scoped access tokens

Questions?

Workshop

short
break



[https://t1p.de/mc-
widget](https://t1p.de/mc-widget)