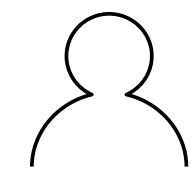


Keynote

Running a large-scale Matrix Messenger at University Medical Center Mainz

The Matrix Conference

About myself



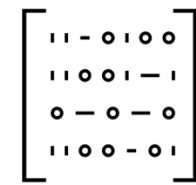
Hans Hüppelshäuser



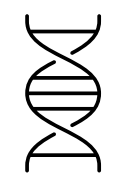
Consultant / Architect



IBMer since 2018



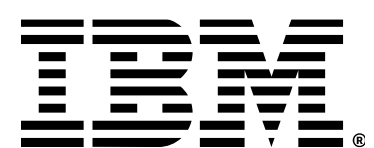
Working with Matrix since 2020



Enthusiast for Hybrid Cloud and OpenShift,
OpenSource, Healthcare and Public



[linkedin.com/in/hans-hueppelshaeuser](https://www.linkedin.com/in/hans-hueppelshaeuser)



8.700

Employees

340.000

Patients

4.230

Students and Trainees



Problem
with digital
communication
in the healthcare
sector

1

High demand for **low-threshold**
messenger solution for quick
communication between staff

2

Existing solutions such as Teams
and Slack are unsuitable for **data
protection** reasons

3

The lack of official solutions ensures the
establishment of **shadow IT**

UMessenger @ University Medical Center Mainz



UMessenger

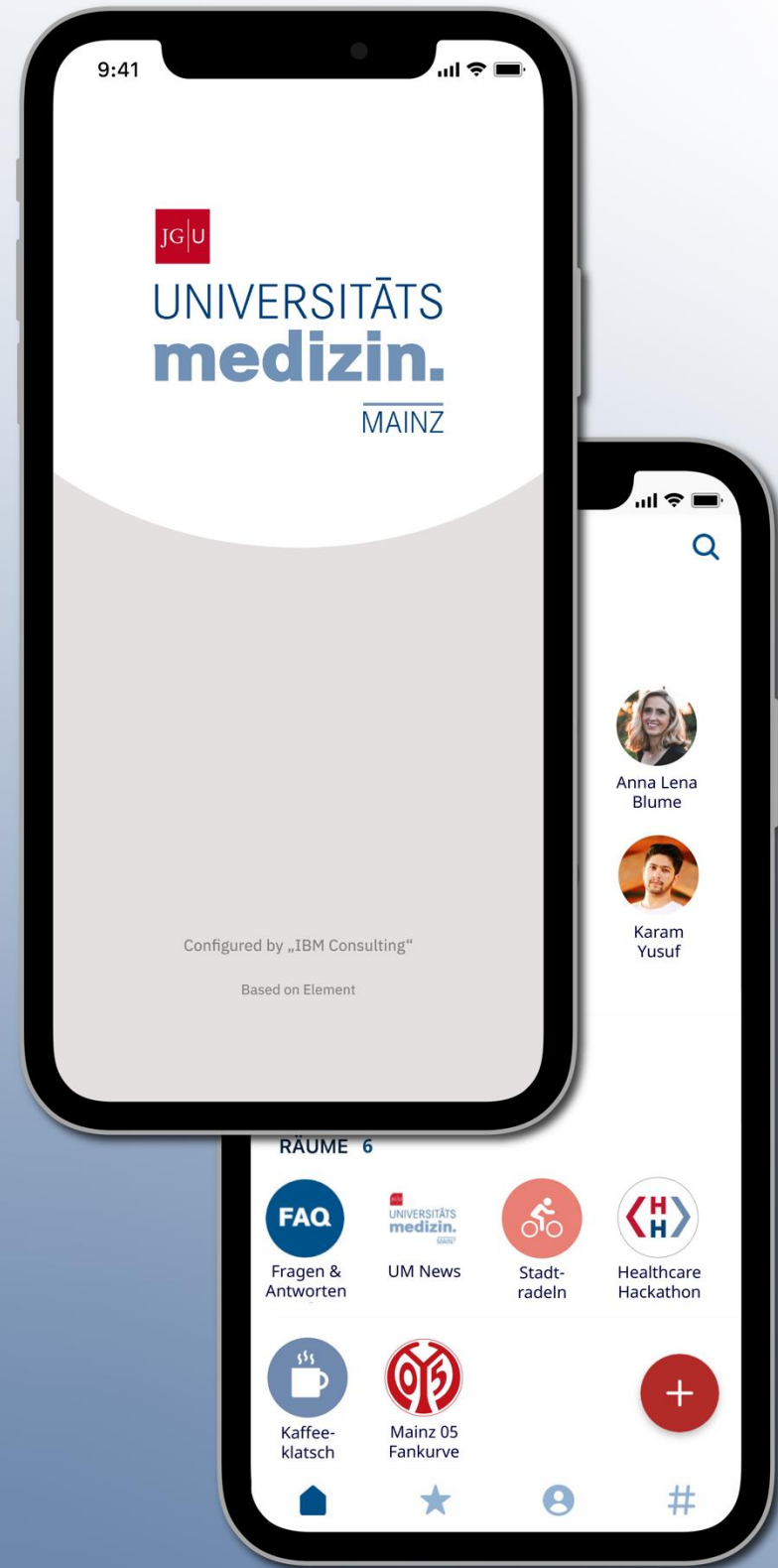
Sichere Kommunikation in
Ihren Händen.





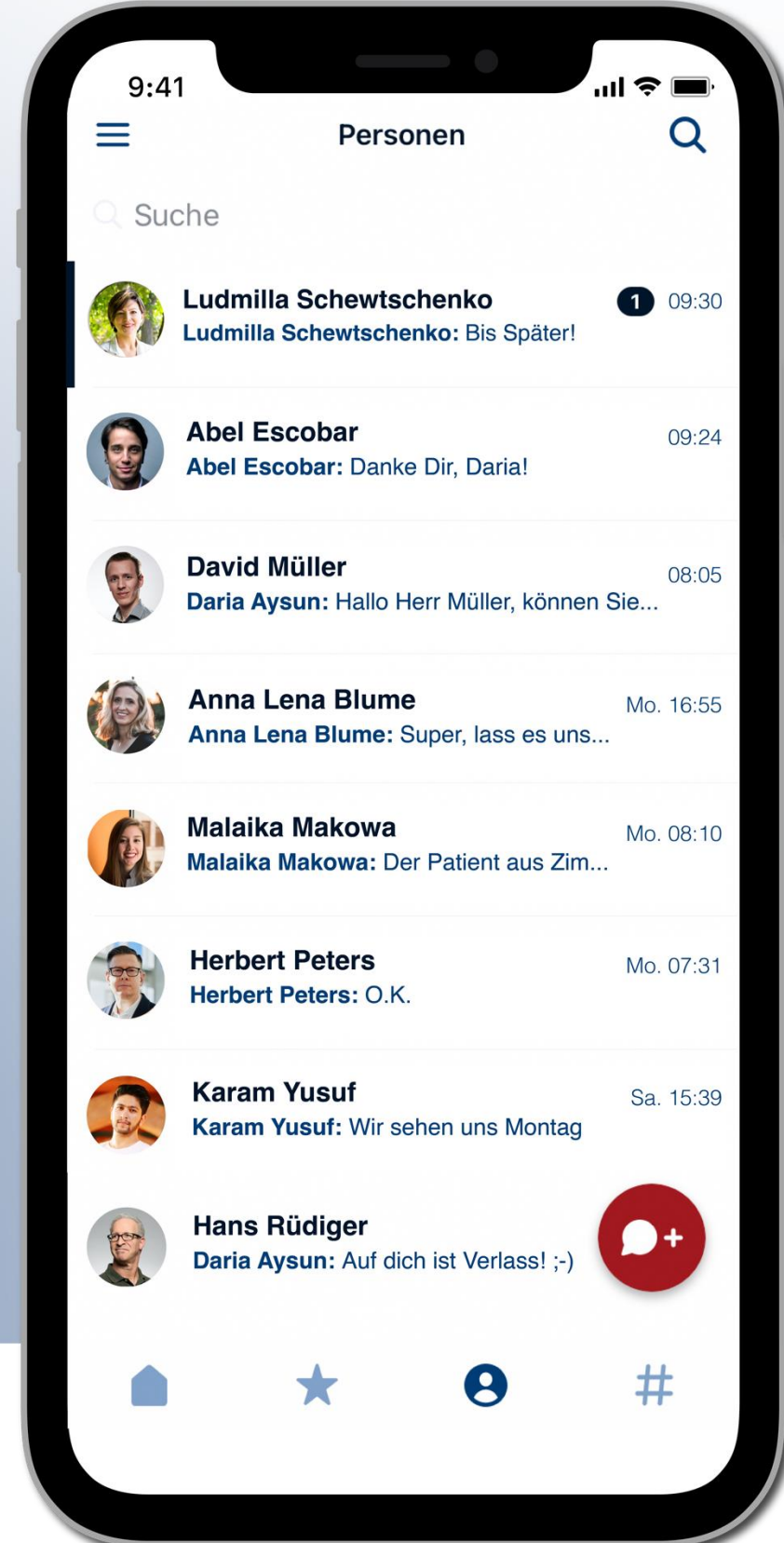
UMessenger

Sichere Kommunikation in Ihren Händen.



Der direkte Draht zu Ihren Kolleg:innen an der Unimedizin.

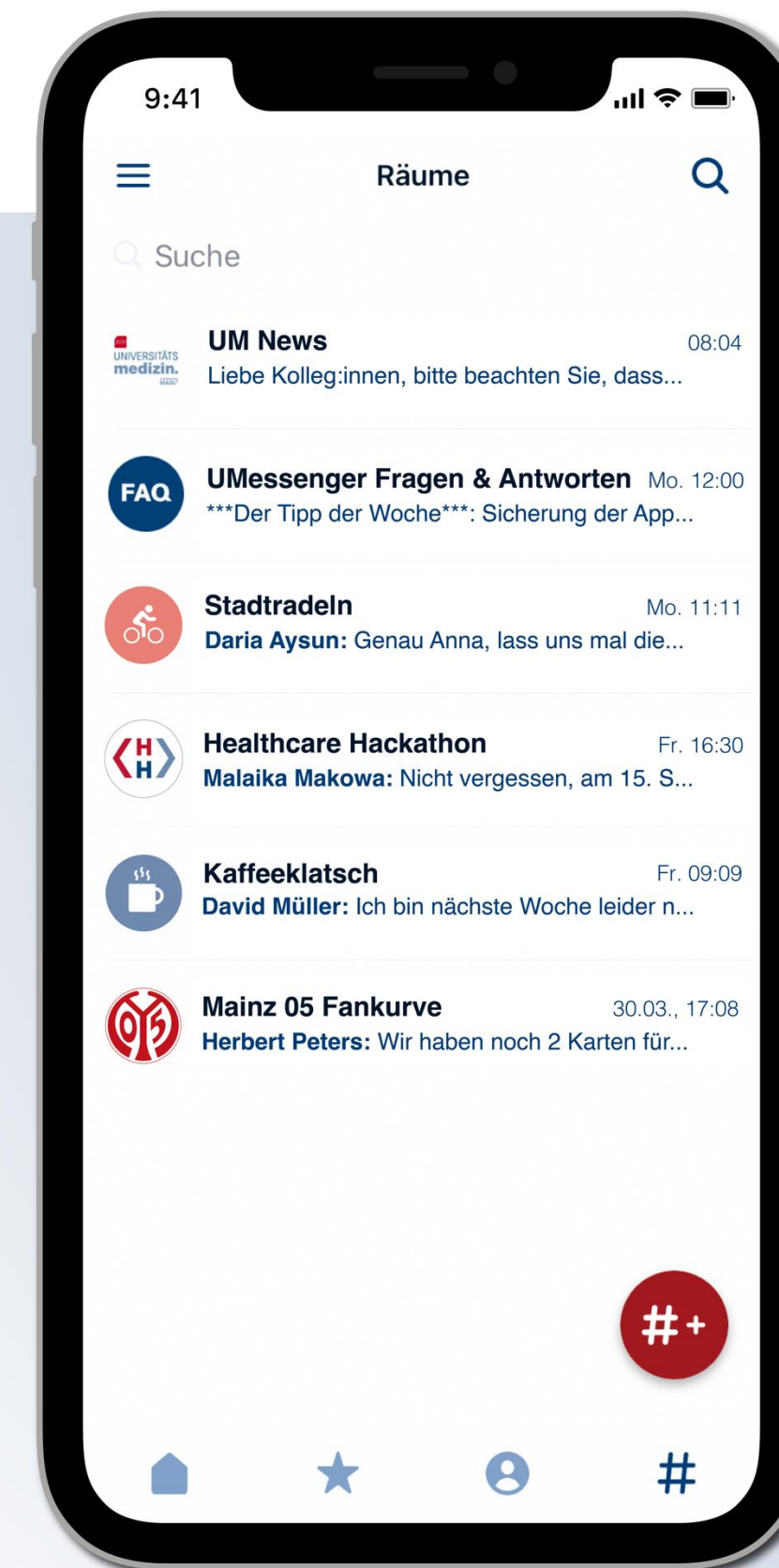
Mit wenigen Klicks Kontakt zu allen Abteilungen und Stationen.



Schneller und vertraulicher Austausch über Ihr Handy.



Formell wie informell.



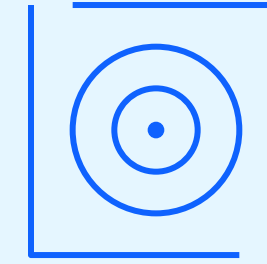
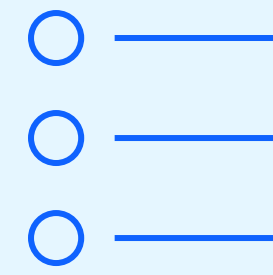
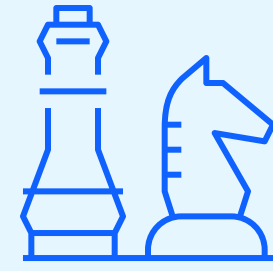
Themenbezogene Räume und Gruppen für Ihre Anliegen.

Treten Sie Räumen bei oder erstellen Sie Ihre eigene Gruppenkonversation.



Vielfältige Einstellungen nach Ihren individuellen Wünschen.

How it started...



Healthcare Hackathon Mainz 2020

Mainz recognized commercial messengers like WhatsApp as a problem early on

- Messenger tool needed for better coordination and collaboration
- Not providing a DSGVO compliant alternative means risking the exposure of patient data
- Boldness to create a secure solution as a first mover on the market

IBM identified Matrix as a promising platform to provide a low-threshold messenger solution

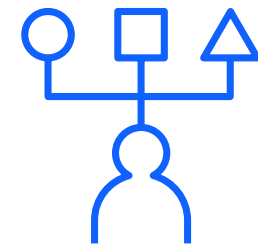
- Active open-source community
- Focus on Security and encryption
- Advanced feature set
- Used by other public institutions

Mainz decided to jump ahead and started a POC together with IBM

- Pilot phase: IT and paediatric clinic for evaluation of general acceptance
- BigBang rollout: All UM employees can register on the UMessenger
- Today UMessenger established itself as the central communication tool at University Medical Center Mainz

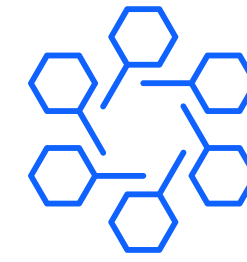
How it is going...

UMessenger established itself as the **central communication tool** at University Medical Center Mainz



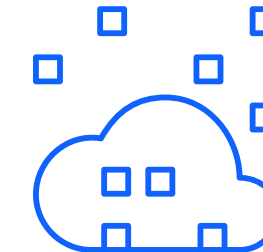
UMessenger allows for a huge variety of use cases for the hospital staff

- Department-specific news and emergency rooms
- Rooms for organizing shift schedules with large groups
- Hospital wide communication channel for the internal communication team
- Personal Notes Spaces



IBM and Mainz work closely together on operations and development

- Regular meetings about the messenger, upcoming updates and emerging problems
- Meetings and discussions with staff members to get a better understanding of the daily usage
- IBM monitors the matrix and element open source projects and roadmap

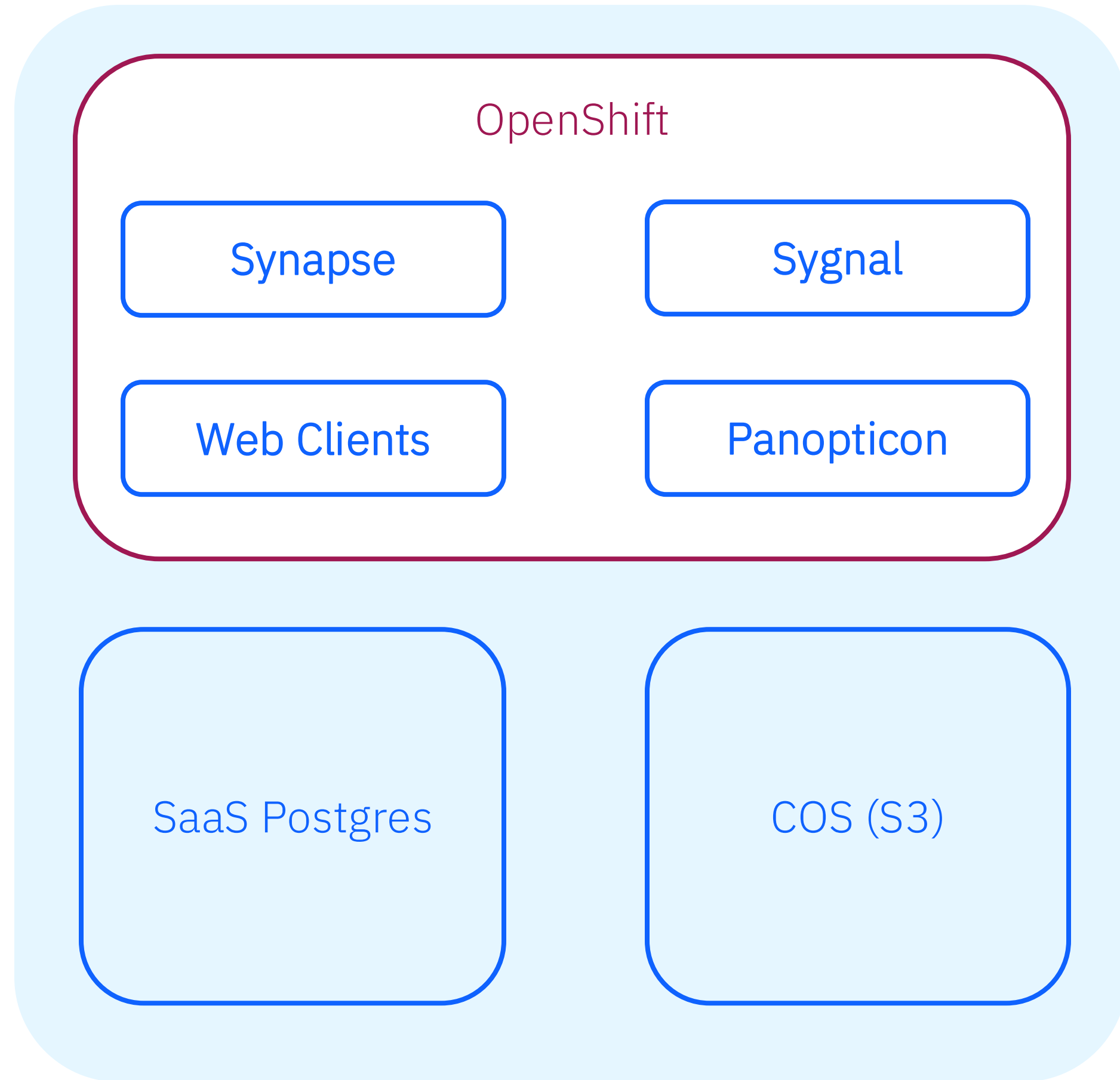


IBM operates the messenger and provides updates every quarter since 2021

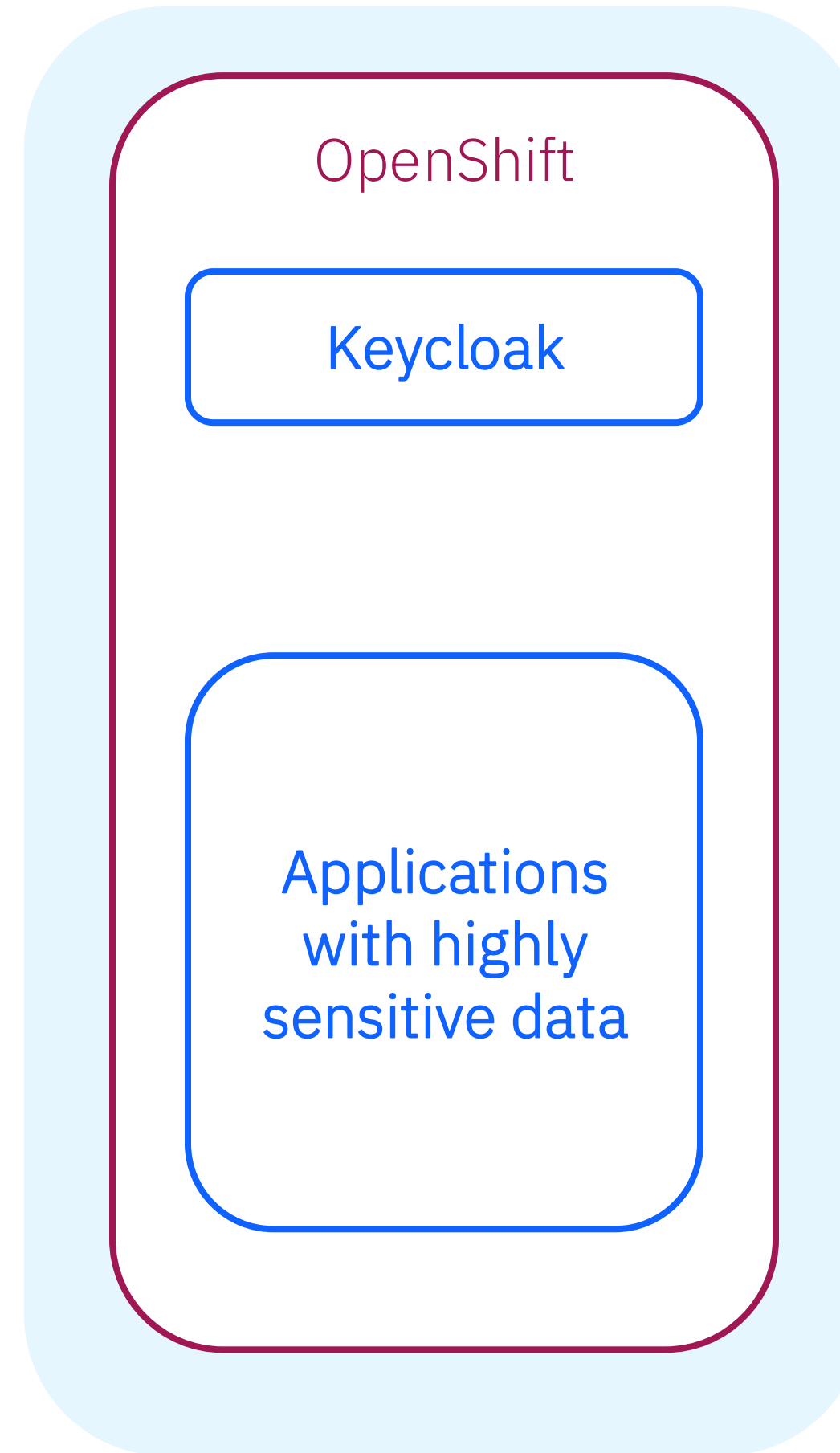
- Scalability and reliability through IBM Cloud
- New Messenger Features
- New Admin Tools
- Better UX

Operation Model

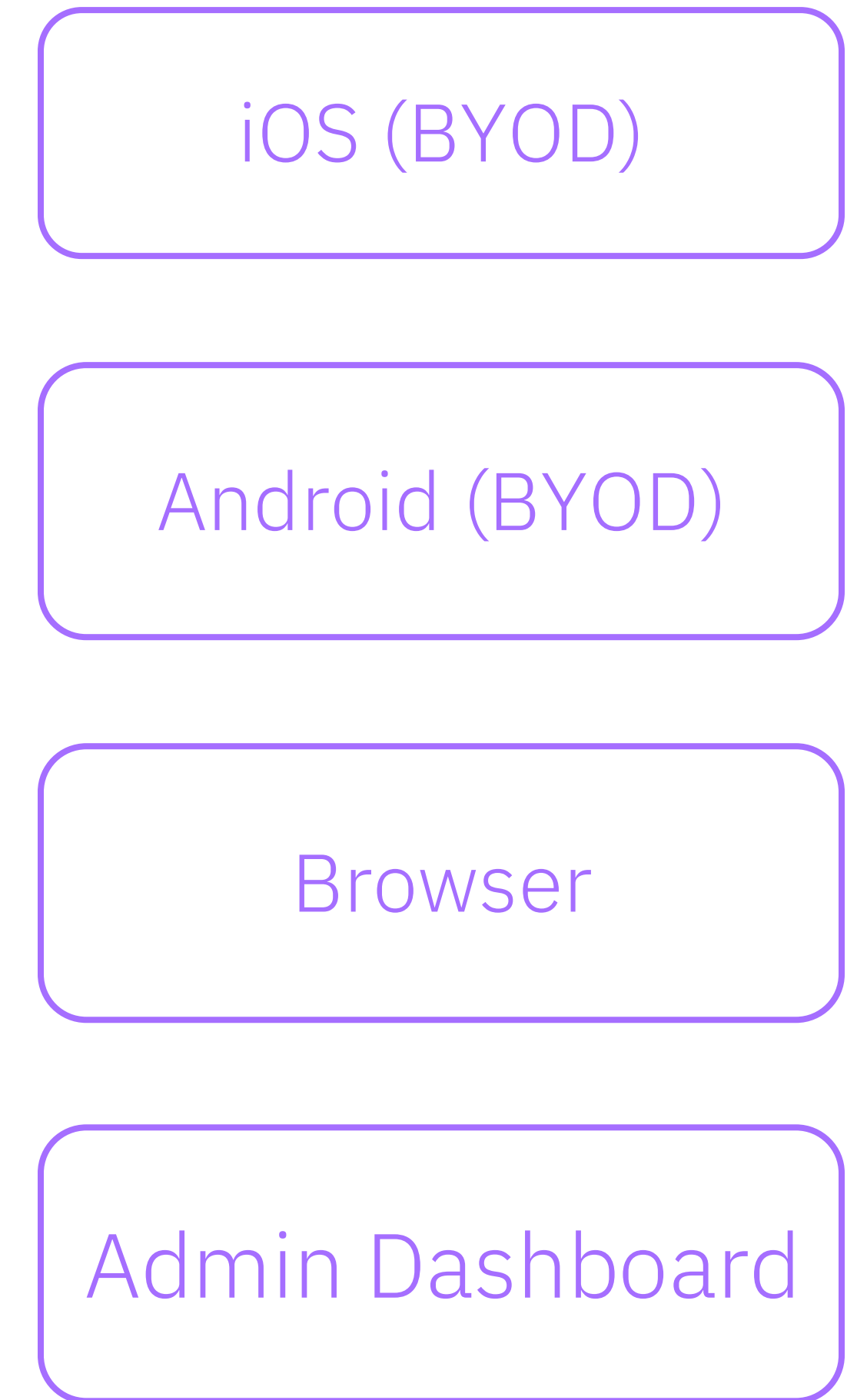
IBM Cloud (Frankfurt)



IBM Cloud Satellite (Mainz)

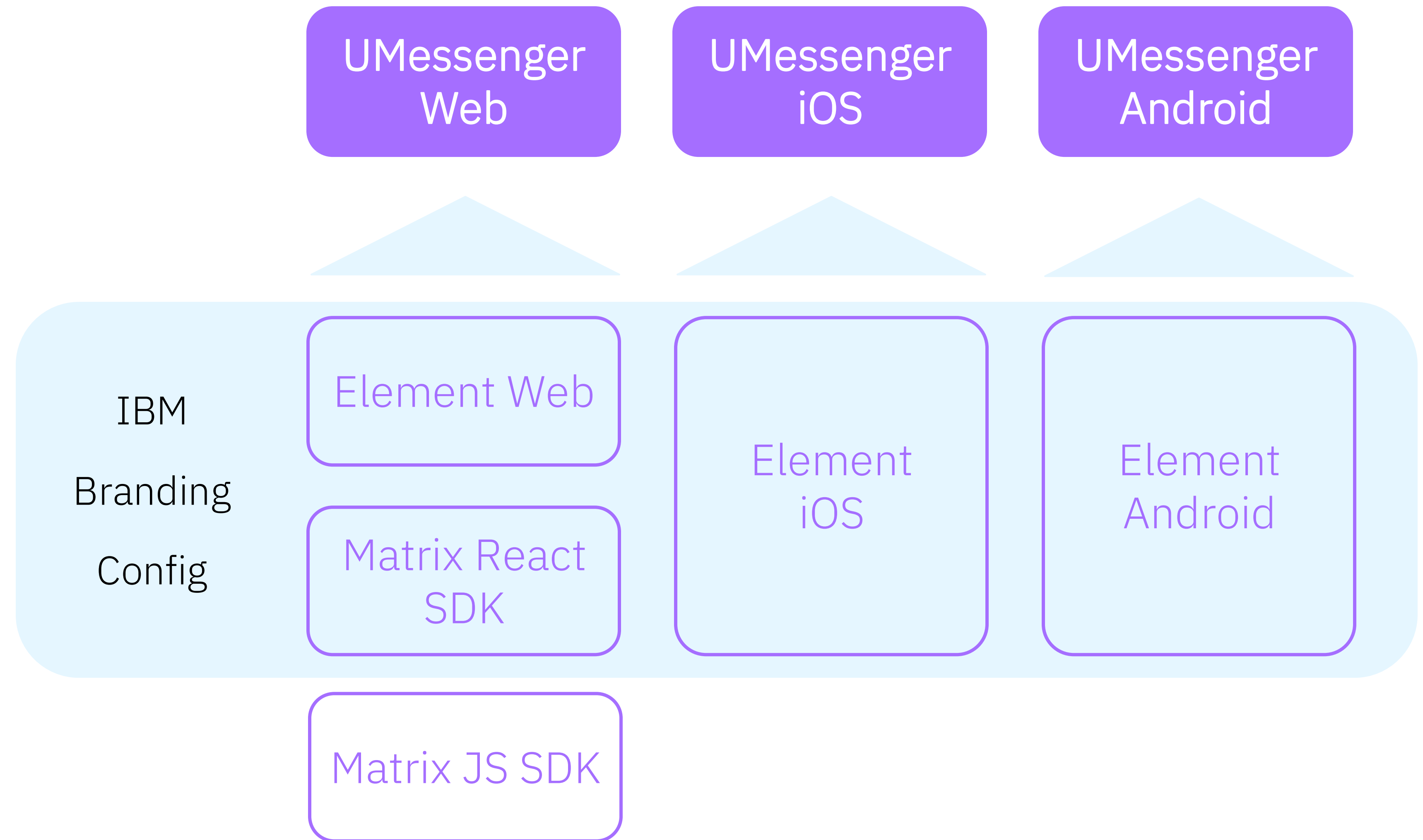


Clients



Customization - Frontend

- 120+ Config Options
- Design is propagated over all platforms
- Clients can decide which features they want to turn on and off



Configuration

- Backend

- All configurations are happening through Homeserver.yaml
- IBM presents configuration options to the client and engages in discussions about them
- Configuration is executed and managed by IBM

```
# This file is maintained as an up-to-date snapshot of the default
# homeserver.yaml configuration generated by Synapse. You can find a
# complete accounting of possible configuration options at
# https://element-hq.github.io/synapse/latest/usage/configuration/config_documentation.ht
#
# It is *not* intended to be copied and used as the basis for a real
# homeserver.yaml. Instead, if you are starting from scratch, please generate
# a fresh config using Synapse by following the instructions in
# https://element-hq.github.io/synapse/latest/setup/installation.html.
#
#####

# Configuration file for Synapse.
#
# This is a YAML file: see [1] for a quick introduction. Note in particular
# that *indentation is important*: all the elements of a list or dictionary
# should have the same indentation.
#
# [1] https://docs.ansible.com/ansible/latest/reference_appendices/YAMLSyntax.html
#
# For more information on how to configure Synapse, including a complete accounting of
# each option, go to docs/usage/configuration/config_documentation.md or
# https://element-hq.github.io/synapse/latest/usage/configuration/config_documentation.ht
server_name: "SERVERNAME"
pid_file: DATADIR/homeserver.pid
listeners:
  - port: 8008
    tls: false
    type: http
    x_forwarded: true
    bind_addresses: [':::1', '127.0.0.1']
    resources:
      - names: [client, federation]
        compress: false
database:
  name: sqlite3
  args:
    database: DATADIR/homeserver.db
log_config: "CONFDIR/SERVERNAME.log.config"
media_store_path: DATADIR/media_store
signing_key_path: "CONFDIR/SERVERNAME.signing.key"
trusted_key_servers:
  - server_name: "matrix.org"
```

Learnings

Onboarding

- Start with a small group / one department and then grow
- Make the registration as easy as possible
- Let users organize themselves

Enablement

- Make sure people know who to contact in case they are having problems with the solution
- Have SMEs in the departments (Power Users)
- Provide tutorials and documentation
- **Understand how people are using the messenger**
- **Keep it simple. Take out the complex parts!**

RUN

- Have beta environment open to all users
- Carry out detailed E2E tests before releasing new updates
- GitOps and Build Pipelines make operation development much easier
- If the Messenger is the central communication tool, make sure it keeps running if everything else goes down

Admin

- Enforce encryption
- Commit to a data retention period and session expiration dates
- Get the on- and offboarding right
- Collect and review statistics
- Provide dedicated administration tools

Cross-signing

Integrations

Access Token

Remote Session

Passphrase

Homeserver

Session IDs

Devices

Session keys

Secure Backup

Passkey

Unverified Login

E2EE

Identity Server

Unverified Sessions

Encryption Keys


Cross-signing
Integrations
Access Token
Remote session
Software
Homeserver
Session IDs
Devices
Session keys
Secure Backup
Unverified Logins
Identity Server
Unverified Sessions
Encryption Keys

THE SOLUTION MUST INCLUDE EVERYONE!

(not just the IT department)

The Challenges

- Matrix ≠ WhatsApp
- Complex Security Concepts are confusing the end-users
- Hospital staff does not have time to learn a new solution
- Messenger must work out of the box
- New concepts like Passkey/ Passphrase are confusing
- Lack of understanding of the solution leads to problems
- Problems like unencrypted messages result in frustration
- Risk of staff turning back to unauthorized private messaging solutions

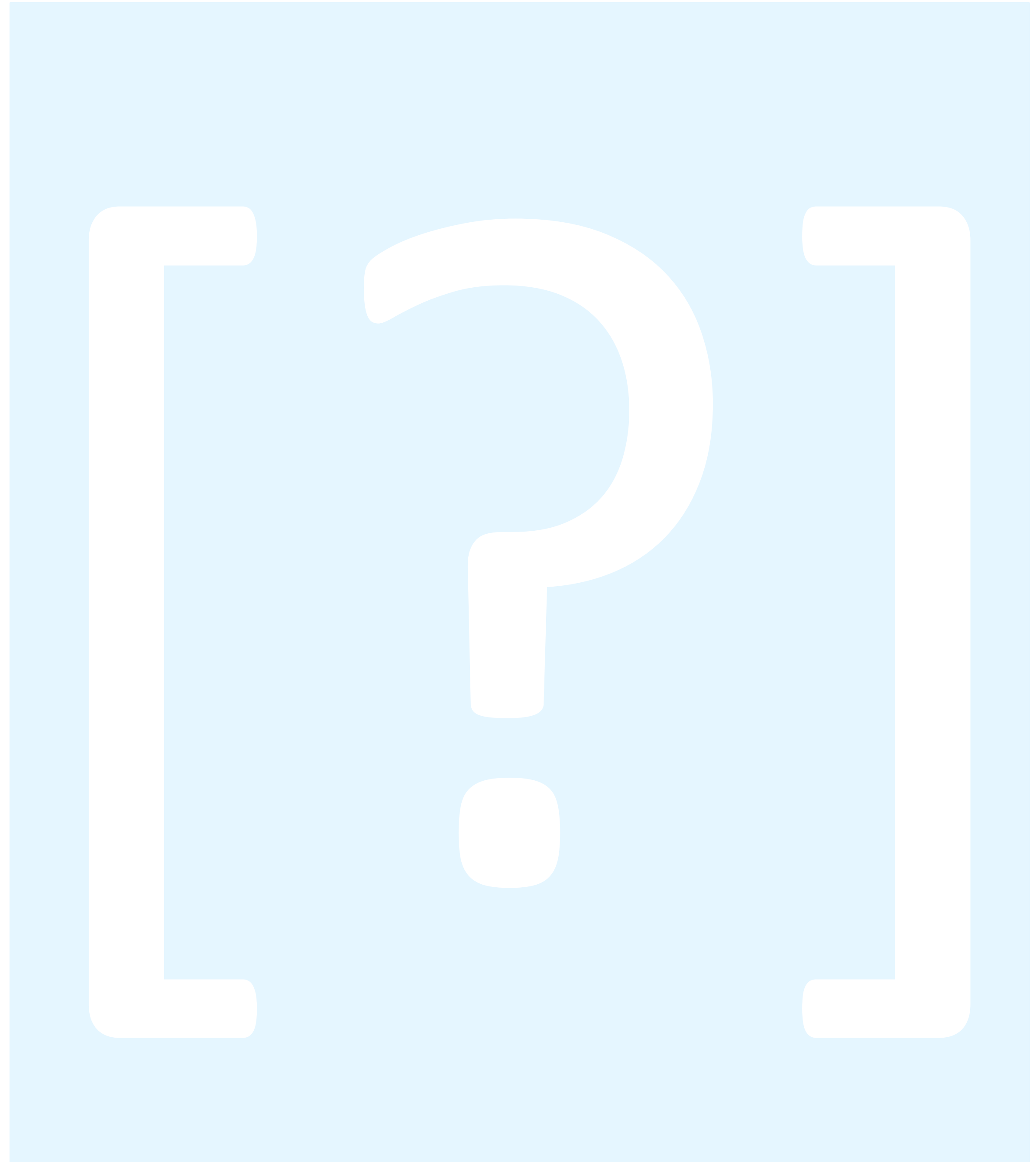


The goal of IBM and Mainz is to make UMessenger user-friendly for everyone while still offering advanced tools for power users.

The Next Step: UMedical Messenger

Goal:
Allow Case-related
communication

How do we get there?



Looking into the future...

UMedical Messenger is the next generation of UMessenger allowing for Case-related communication and improved user experience

Utilizing Mobile Application Management

- Staff can still use their own smartphones without having the whole device managed by Mainz
- Messenger data and private data are strictly divided
- UMedical Messenger can be distributed over private UM Appstore
- Advanced onboarding options
- VPN connection gets automatically established when opening the app

Restricting Access from outside the Medical Center Network

- Heightened security through IP-restriction
- Ensures that only staff can access Messenger Resources
- Thanks to MAM, this change is almost invisible to the end-user
- the app

How can UMedcial Messenger and TI-Messenger co-exist?





IBM open source by the numbers

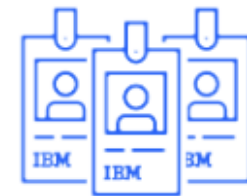
At IBM, we take open source seriously. We train our employees in the best practices for engaging in open source communities and the importance of open governance, and we empower them to create open source projects that solve their business and personal problems.



25+

years in
open source

[Read our story →](#)



7,400+

IBMers active
in open source

[How we do open source →](#)



20,000

commits per
month

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