

An overview of MedComs video-infrastructure

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VDX

VDX user base

- **Regions**
 - Largest user base (120k+ meetings), most of healthcare in Denmark is concentrated under the regions
 - Hospitals, acute functions, GPs and cross-sectoral cooperation
- **Municipalities**
 - Smaller user base (8k+ meetings), mostly used in elderly care, home care, social work and cross-sectoral cooperation
- **Governmental institutions**
 - High-level healthcare related communication and cross-sectoral cooperation

The challenges

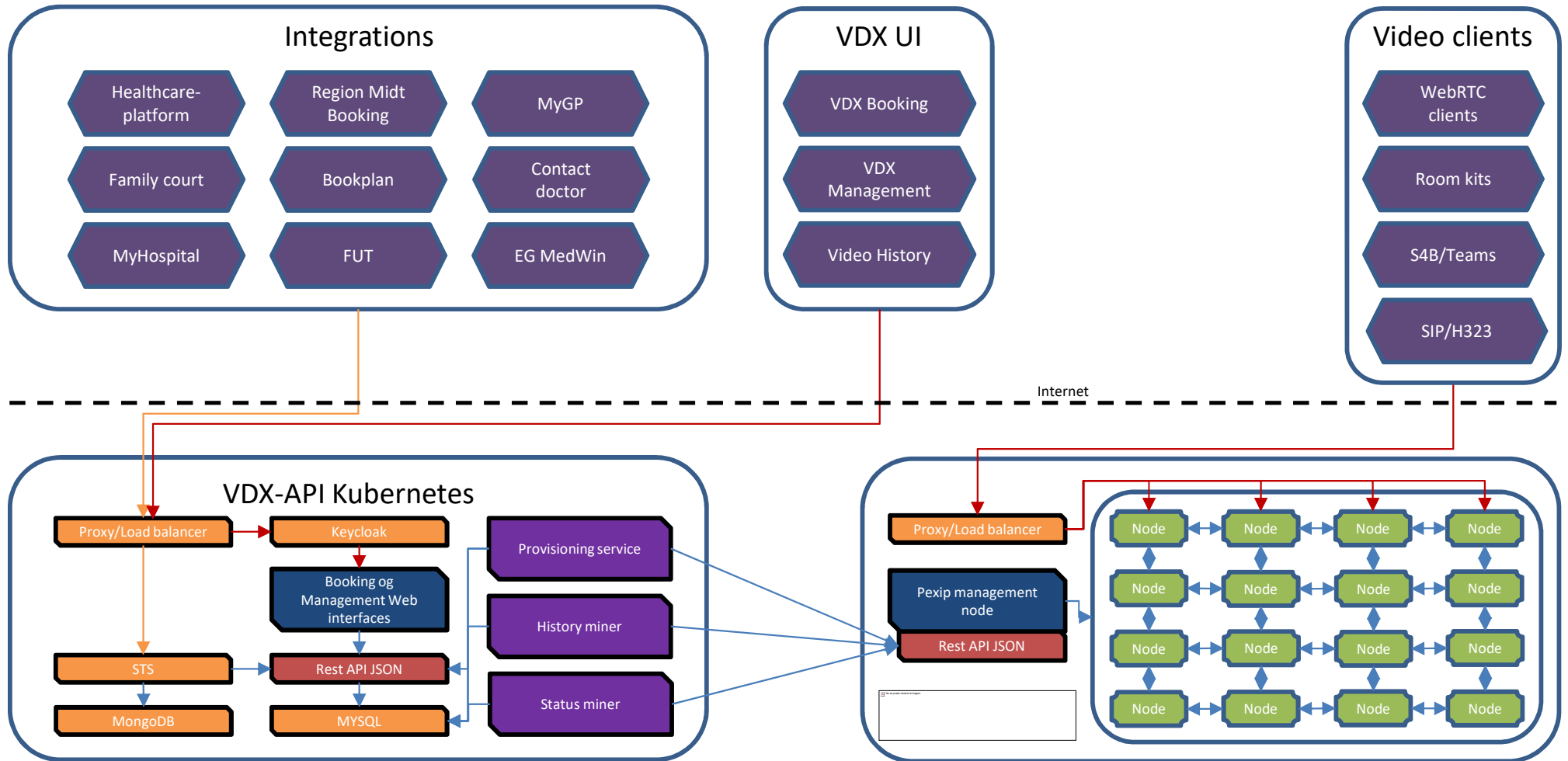
For VDX to be a functioning and usable system, it needs to live up to a few requirements.

- Cross platform communication
 - e.g. Cisco UC, Cisco webex, Skype for business, Microsoft Teams, Google Meet and other SIP enabled systems.
- Works on all types of devices
 - e.g. room-kits, video-phones, desktop-clients, web-clients and mobile devices
- Publicly available for all citizens, even outside DK
 - It must be possible for a patient to have a video consultation even while on holiday
- High availability, scalability and security
 - Self-hosted with redundant datacenters, firewalls and internet connections
- Integration from external systems
 - Option to do deep integrations from healthcare systems to allow for booking of meeting rooms
- Privacy

The technical solution

- (Backend) Self hosted video-infrastructure (Pexip)
 - Named meeting rooms and auditoriums
 - Registration of video clients
 - Customizable theming of meeting rooms
 - Customizable theming of web-clients
 - Connectors for Skype for business, Microsoft Teams, Google Meet
 - Conferencing nodes with build-in redundancy
- (Middleware) Custom control infrastructure
 - User Access Control with IDWS, certificates and federation option for connected organizations
 - Provisioning of meeting rooms and history mining
- (Frontend) Custom user interfaces for booking and administration
 - Frontend API for integrations
 - Booking interface for organizations without integration options
 - Administration interface where each organization gets their own space and control

System overview



(The arrows represent the direction of communication) → User access route → Integrations → Internal/backend communication

Meeting room booking

Meetings created through integration or the default booking interfaces are booked with a date of the meeting, security options and room options preselected by the organization. This way the users don't have to concern themselves with the technical aspect of the meeting since this is done by a preset option in the administration interface.

Users are presented with a direct link that gives access to the meeting as a clinician and a separate link is created for the patient.

Booked meeting rooms consists of 3 randomly generated id's for address, guest pin and host pin that is not reused in the same order again.

Together this brings a uniqueness and security to the meeting room that is considered good enough for secure communication between patient and clinician.

As an added measure the date of the meeting ensures that the meeting room does not exist outside of this timeslot.

Administration

All connected organizations get their own space in the VDX management system. Here they have full control over everything from users to meeting rooms and theming.

In this space each organization can create new sub-groups and sub-organizations with their own preset settings and templates.

Each organization can have their own domains there is a system in place to create booking templates that control the nature of the booked meeting rooms.

Available administrator functions include, but not limited to:

- Meeting rooms / auditoriums
- Registered devices
- Theme handling
- Automatic participants
- Local users
- Visualization of currently active meetings
- History logs of processed meetings

Integrations

The best way of utilizing the VDX video-infrastructure is to do deep integration using VDX-API. This way the best workflow and user experience is achieved for both practitioner and patient.

Integrated systems usually consists of a booking system and a client system. e.g it could be a patient booking system in a hospital with an app for patients or a single button function that books a meeting and sends the link in a SMS.

An integration can be many things and depend entirely on the current assignment, but an integration to any video system is to be preferred. By integrating directly to the video system you gain control of the entire process from user log-in to the end of the meeting, including what video client to use and custom logging of errors for troubleshooting.

The main purpose of VDX-API integrations is to be able to order video resources for your app/system without having a full video solution implemented witch is expensive for small businesses.

Security

- Meeting rooms use rotating randomly generated addresses and pin codes
- WebRTC clients ensures HTTPS encrypted communication
- Secure 256bit encrypted VPN connections between conferencing nodes
- User access control with IDWS, certificates and AD federation
- No logging of personal information for privacy

Questions

