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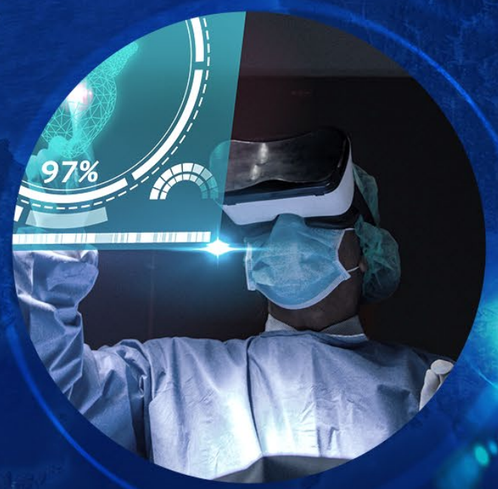

Four healthcare regions, one digital approach

How VMware connected Norway's four independent health regions.

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VMware's mission: turn Norway into a digital health leader

VMware was already an established partner across Norway's health regions when the decision was taken to prepare the country's technology architecture and infrastructure for the digitally enabled healthcare needed now and in the future.

The result was a three-year agreement to bring faster, better, and safer services to the country's health trusts through building a solid hybrid platform for the future also enabling integration with public cloud services.

In this document, we'll tell the VMware-led journey. We'll outline the challenges that were overcome, the solutions put in place, the outcomes and the outlook for digital healthcare across Norway today and into the future.

Four regions, one approach

The four regional systems that provide Norway's public healthcare also, critically, control the IT used by healthcare providers in their regions. This presented a great opportunity to deepen integration within a region – and across the whole country.

It was already recognized that public cloud functionality was needed to bring agility and speed, but the regulatory and legacy tech implications required a unique fix.

From POC to implementation

Applying a unique way of working across multiple stakeholders, VMware took a strategic, consultative approach and lead planning so all regions could share insights as they progressed with their own modernizations.

VMware Professional Services and partners provided optimal solution design and validation to help some of the regions to create an approach that met their specific needs while ensuring consistency and interconnectedness across all the regions.

As a result, the process from agreement to implementation took just a few months as proof-of-concept solutions ended up becoming the final running environments.

Aligning infrastructure

Working as strategic partners, VMware and the four regions forged a single multi-cloud agreement – with four contracts – to align all technology infrastructure and enable a series of truly interconnected health systems.

Each region would remain its own entity, but with common systems to improve services across the nation.

Privacy, trust, and future-proofing – the challenge of updating public healthcare

In 2019, the regional systems recognized the need to onboard new capabilities as services had become too slow and patient experiences no longer met the desired standard.

Each region needed the capabilities of the public cloud so they could deliver digital health services fit for today and ready for the future. However, the journey into the cloud was littered with barriers.

Protecting health data and patient trust

Across all four systems, there was one overriding concern – protecting data and ensuring the trust of service users. Any new approach would need to respect the sensitivity of patient records through adequate digital safeguarding.

Data would need to exist 'onshore' so its various uses and storage would always comply with Norway's laws. In addition, hospital systems needed to ensure health wasn't compromised and to keep services available.

Empowering patients and medical teams

Modernization would mean increase reliance on networked applications so medics could monitor IoT-devices and administrators could run the complicated logistics of a modern hospital.

Apps tied everything together. As such, downtime wasn't acceptable. Yet, legacy infrastructure couldn't support the advanced requirements of modern apps.

Extending service reach:

Each health systems couldn't keep pace with the rise of new apps. In a traditional data centre, servers might take months to set up. They needed to break away from manual routines and constant pressure on the IT department.

Greater efficiency required process automation and a modern data centre. The challenge, however, was the legacy tech. It couldn't scale, but it was still necessary.

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Digitized public healthcare - private clouds and micro segmentation

The challenge of onboarding new capabilities while adhering to strict guidelines and integrating with legacy technology, had only one solution: entire hospital services were moved to their own private clouds.

Within a private cloud, each region gained public cloud capability while maintaining absolute control over their computing environment.

Adapt and scale based on patient needs:

Each private cloud was created using VMware Cloud Foundation to fulfil the requirements for apps and data to be protected and managed locally, while bringing the benefits of scalability.

By automating outdated processes and mundane tasks – such as defining storage - hospitals across Norway can quickly adapt and scale to meet the needs of patients.

Servers can now run an ever-increasing volume of clinical apps – like Dips, Kurve and Gat – and admin apps for services like HR and finance

Server setting is now done in a self service webstore-like interface. It only takes a few minutes, compared to previous worst-case scenarios of two months

Want to create a private cloud – here's how

VMware Cloud Foundation delivers virtual servers and containers to standardize and speed up digital delivery and increase security. The solution can tie departments together in a unified Storage, Network and Compute interface so teams can work more flexibly.

For automation, operations, log analytics, and lifecycle management on-premises, the SDDC manager is the vital interface to VMware Cloud Foundation. It enables virtualization in vSphere and lifecycle management in the vRealize suite of cloud management solutions that integrate with VMware's other products.

The final piece of the jigsaw is VMware vSAN storage virtualization software, which is fully integrated into the automation, to help reduce storage cost and complexity.

A matter of life and death

In any hospital, system failure or security breach can be catastrophic. It could even lead to the failure of critical support equipment and a loss of life. That's why VMware enables 'micro segmentation' in its private cloud.

Micro segmentation protects apps from other apps by placing intrinsic security in each one. By isolating each app, the system is secured by reducing likely spread of dangerous code. In turn, this reduces downtime and ensures services run 24/7.

Micro segmentation is an essential part of the delivery and the biggest win of the project – it delivers...

Security and confidence in virtual machines and apps

Breaches can be stopped easily with the integrated firewall

Efficient systems deliver better outcomes

Helse Nord has gone beyond operating just a private cloud with the introduction of a hybrid system where critical services run on-premises in a private cloud, while others – like accounting – run on the public cloud to benefit from this highly scalable solution.

Shifting to a hybrid cloud enabled the organization to upgrade its infrastructure without needing to expand.VMware enabled it with more time to focus on delivery, as well as an increased flexibility to implement changes.

"Let`s say we needed to expand our data centre. We first had to place an order, then wait for parts to be delivered from Europe.

Then you install them physically into the specific, on-premises data centres. After that, you needed to make the three divisions coordinate with each other.

That was difficult in a busy workday. It was not uncommon to wait several weeks for us to deliver what the organization needed."

Vegard Jørgensen, Senior Advisor, Helse Nord IKT

What did Helse Nord gain?

HELSE NORD

HQ:
Bodo, Norway

Staff:
19,000

Citizens:
480,000

Hospitals:
11

Challenges:
Modernize data centres, transform networking and security

VMware solutions:
vSphere, vSAN, NSX, and vCloud Suite

Now patient data is safe, secure, and compliant with regulations, Helse Nord can let patients to access their own health information through a public website. The result is a changed doctor and patient relationships, with patients empowered with data.

Let's recap... 10 big wins for public healthcare in Norway from working with VMware

1. Gained the automation benefit of the public cloud, in a private cloud
2. Server set up reduced from, at worst, two months to ten minutes
3. Modern data centre set up prevents spread of dangerous code
4. Server time can be dedicated to proactive work
5. Access to digital records helps patients take charge of their health
6. Digital shift planningtools for staff and employee portal enabled
7. Time freed for IT teams to focus on delivery
8. Flexibility improved to implement changes easily with minimum fuss
9. Focus can now shift toward DevOps models for greater digital health innovation
10. Cost efficiency gained by not having to hire a large IT workforce

The future of Norwegian healthcare – personalization, devices, and AI

Like other countries, Norway is dealing with the retirement of a large part of its workforce. As they age, increasing pressure will be placed on public healthcare. It's hoped that increased use of technology can reduce the likely burden on services.

Personalized healthcare and IoT devises – Norway's already on that journey

Tech-native patients already demand greater personalization in health services. Fortunately, their familiarity with new digitized devices means adoption could be easy and widespread.

"We already have heart monitors reporting patients' heart rhythms directly into our digital infrastructure. IoT with sensors has huge potential, and we are already talking to leading providers," says Jørgensen.

> "But IoT will also demand a lot of extra capacity from our data centres. That's why it feels great knowing that our digital infrastructure is ready to meet this demand."
>
> **Vegard Jørgensen**, Senior Advisor, Helse Nord IKT

More services moving to hybrid clouds

Exploration of hybrid clouds will continue at pace. As more server capacity is migrated, functions that aren't strictly guarded can increasingly be run on the public cloud. However, two challenges are on the horizon:

- Modernization of old systems is underway so that they work with newer services. A common platform is needed to integrate with public cloud services – like Azure, Google Cloud Platform, IBM, AWS, and Oracle - without compromising privacy and regulatory requirements
- Establishing tests to see if Kubernetes is a realistic next step – Kubernetes can deliver containers onto a platform without having a separate cluster; all these containers can live on virtual servers

And then... AI & ML in healthcare

The future of healthcare lies in marrying artificial intelligence (AI) and machine learning (ML) with technologies such as cloud, virtualization, and sensors to provide unprecedented visibility across care systems.

In the future, healthcare leaders can fully mine data to improve patient outcomes. Diagnosis can be shifted from a single consultant toward data from thousands of insights and other diagnostics to improving accuracy.

To discover how you can deliver digital healthcare like Norway, please...

Further reading

Blog

Emerging technologies converging to transform healthcare

Product

Healthcare IT solutions from VMware

Case study

Helse Nord is ready for the future of health tech

Contact

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