



Building a platform for efficient collaboration that is ready for the future

Customer Success Story: Nextcloud at DEGES

July 2019

DEGES

Key points

- Employees demand easy to use, efficient collaboration technology
- Introduced Nextcloud Enterprise File Sync and Share solution for document exchange
- Integrated in existing infrastructure, processes and workflows

Project overview

- Goal:** Providing digital infrastructure for distributed collaboration
- Industry:** Semi-public project management organization
- Employees:** 350 to be provided with private EFSS
- Solution:** Nextcloud Files
- Integration:** NTFS ✓, user directory, existing ECM ✓
- Highlight:** Project space for document exchange and collaboration with hundreds of external participants



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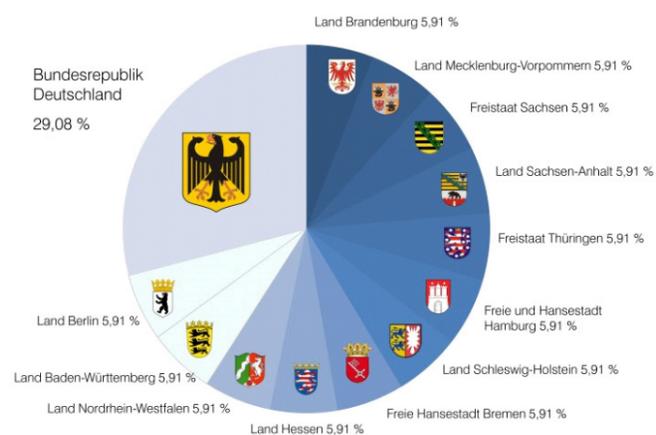
Jens Düssel, Department Head IT and Organisation

About DEGES

As a project management company for complex transport infrastructure projects, it is the task of DEGES to economically plan transport routes, whether road, rail or waterway. In a complex and distributed project and quality management system, DEGES coordinates, optimises and manages the services of external planners and architects, land purchasers, construction supervisors, construction companies and other service providers. DEGES maintains control over costs, plans and construction, handles invoicing and hands over the finished structure to the public clients according to the highest quality standards, within time and budget.

Although DEGES does not take part in the competition for the acquisition and execution of its contracts in the sense of public procurement law, it is deeply connected with the organizational structures active in this sector: the contract management of the federal states and the engineering and construction companies. DEGES's work comprises the implementation within the framework of conventional procurement (budget financing) as well as the implementation as a public-private partnership (PPP) project.

The founding partners and customers of DEGES were the Federal Government and the five German states in 1991. In recent years, more federal states have joined, relying on DEGES and its 350 employees for managing transportation infrastructure projects. Today, DEGES is responsible for the expansion and new construction of more than 2,300 km of federal highways with a contract volume of over € 22 billion.



The Challenge

- Make available existing and new documents to team members on the go and across organizational boundaries
- Provide a unified, easy to use, efficient project collaboration platform that can be managed by the employees themselves
- Integrate into existing infrastructure and workflows and provide a roadmap to deeper, more integrated collaboration and communication

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“We need a unified cloud platform for collaboration both internally and externally.”

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The Cloud Strategy of DEGES

At DEGES, dozens of project teams consisting of hundreds of people from dozens of organizations work in always-changing composition. Facilitating efficient collaboration for internal and external project team members is key challenge for IT. Employees expect to be provided access to their documents on the go, an excellent user experience from easy and efficient tools and smooth collaboration between team members within and across organizational boundaries.

Under the motto “Roads are our goal”, DEGES has been helping to efficiently network people and goods by road, rail and water since 1991. Within the framework of the infrastructure projects managed, numerous documents, files and information must be efficiently stored in order to be available to the various project participants at the right time. With the City Tunnel Leipzig, for example, a well-known major project was completed at the end of 2013. After 10 years of project work on the City Tunnel, DEGES was managing approximately 500,000 documents.

New processes and tools to meet new demands

In the 1990s, DEGES was active in the new German states and the development of infrastructure after reunification – the first two letters of the name DEGES mean “German Unity”. Since then, DEGES has built up a high level of project management competence, resulting in a wide range of projects to expand and maintain the transportation network in 12 German states. A total of 350 employees are currently employed by DEGES at the Berlin headquarters and at project-related locations in Bremen, Hamburg, Düsseldorf and Frankfurt (Main).

With the expansion of the scope of tasks and activities, an increasingly decentralized collaboration model with flexible project teams was developed. Where previously static departments developed their own working methods and information silos, highly qualified engineers, lawyers and business process experts now work on various projects and exchange documents across locations. “We had to realign our IT and organization. We needed a unified document exchange platform to organize collaboration across departments and with external parties,” says Jens Düssel, Head of IT and Organization, describing the initial trigger for the introduction of a file sync and share solution. “The flood of documents was growing and the call for an online collaboration solution was getting louder.”



Company-wide focus on collaborative document exchange

Right from the start, the focus was not only on storing, editing and archiving documents, but also on mapping business processes. As part of a company-wide IT infrastructure project, a strategic, uniform platform was to be created for the administration and exchange of documents and data within the framework of the entire project handling.

All relevant information on a transport project or other process should be systematically combined and made accessible in a context-related manner - from the call for tenders, through all correspondence with clients and service providers, to invoicing, completely documented and traceable.

Digital infrastructure instead of paper and mail

Existing, mostly site-specific information silos in file directories and isolated filing systems were to be dissolved and the change to digital working methods that has begun was to be further promoted. After all, the shortest way to exchange documents is digital - via a common platform. This is a crucial prerequisite for an increasingly decentralised way of working.

Instead of continuing to send paper, CDs or e-mails between headquarters and branch offices or to service providers and clients, the various project participants should be systematically integrated. Who has access to which areas must be controllable at different levels, for example to reliably secure sensitive internal areas such as land acquisition and allocation or to make certain documents available to external project participants in day-to-day business quickly and easily.



Formalizing contract work flows

As a first step, Enterprise Content Management (ECM) and Document Management Systems (DMS) were implemented, supporting digital workflows and online document exchange. The solution is used to support the workflow for legal documents and contracts, providing a secure repository for documents with version control, process routing and workflow management and retention.

Project management needs a low-barrier collaboration solution

As project management company, DEGES not only uses its extensive document pool internally, but is also in constant contact with clients and service providers such as surveyors, building contractors, architects, etc.

This dynamic environment with multiple, often changing projects and members from inside and outside the organisation required a cloud solution that can be managed by team members themselves and that fits the expectations and needs of a new generation of employees.

The cloud offers external project participants access to documents and project areas in the cloud via web access, when they are released by the project manager for them to read or edit - without requiring the installation of any software and from any location.

“The cloud is an important work facilitation for us in project work: a digital space where you can meet, exchange documents and save yourself the hassles of sending and managing documents in e-mails and even on CDs”, Jens Düssel describes their solution.

Key requirements

- Facilitating collaboration and team work across organizational boundaries
- Seamless cross-platform, on-the-go document access across mobile, desktop and web platforms
- Easy user interface, excellent user experience
- Allowing users to self-manage, relieving IT administrators
- Unified access to documents irrespective of underlying storage technology
- Protecting data security without disrupting collaboration





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Collaboration model

Project Manager DEGES:

- Creates an external account for online access
- Shares documents in the cloud

External user:

- Logs in via online access
- Displays documents, create new versions or new documents

Introducing Nextcloud: a File Exchange and Content Collaboration Platform

With ease of use, integration and extensibility key requirements, Nextcloud Files was adopted as the solution for Enterprise File Sync and Share. Its low barrier to entry combined with powerful collaboration capabilities, enabling employees to discuss documents, manage versions and seamlessly share with others within and outside the organisation, were central to the decision to go for Nextcloud.

In a pilot, users were immediately enthusiastic about the user interface and simplicity of the sharing and collaboration model. "Ease of use and ability to self-manage were key for our users and acceptance of the Nextcloud Files solution was immediate and enthusiastic", said Jens Düssel.

Provided solution

- Nextcloud Enterprise File Sync and Share solution and Content Collaboration Platform
- Open Source, self-hosted (on premises), zero-licensing cost, no-vendor-lock-in
- Efficient and easy to use web, mobile and desktop interfaces
- Nextcloud Enterprise Subscription providing services and support
- Professional Services developing required features and integration capabilities

Platform decisions

DEGES choose to deploy Nextcloud on virtual servers (ESX based) in their own data center as well as in rack space rented in a data center. Currently, the setup is using a single Linux Nextcloud node with external data on a windows SMB server.

Installation

DEGES was running an ownCloud 9.0.8 installation but had decided to move to Nextcloud. They experienced a number of issues and wanted a setup with the following properties:

- ability to use SAMBA as file storage
- LDAP as user backend
- ability for users to authenticate their mounted WebDAV storage in Windows with SAML (Kerberos)
- ability to register users also besides LDAP, directly in Nextcloud

At the time, DEGES suffered from an issue with SAMBA, where users noticed shares disappearing. The situation was as follows:

- There is an SMB share - let's say under /Server/Share
- Files are in folders like /Server/Share/ProjectID/SubID/Folder
- DEGES mounts /Server/Share into their ownCloud
- A user then shares Share/ProjectID/SubID/Folder/File via link
- The same or another user renames Share/ProjectID to Share/ProjectID2. ownCloud doesn't know that this was a rename and deletes the share.

Nextcloud has an SMB Notify feature which fixed this problem, as it makes Nextcloud aware of renames as such. This solved the SMB issue.

To make the authentication model work, however, another hurdle existed: it was not possible to use both SAML and local users. Building on the Mid-Size-Deployment recommendations in the Nextcloud documentation on the customer platform and based on their earlier experiments with ownCloud, DEGES set up a test system based on two instances:

- One for external users, who log in as Nextcloud user, employing the Nextcloud Registration app for self-registration, as well as integrating with LDAP.
- And second, one for internal users, employing LDAP with Kerberos for authentication.

The two instances were connected through federation, allowing users to seamlessly share to users on the other system.

During testing, this setup worked for their use case, however, the complexities of SAMBA and federation between two Nextcloud clusters (which uses WebDAV for communication) and then another mount of WebDAV to the users' desktop caused occasional and hard to track down issues. Every file action would require multiple hops between servers and there were several layers of caching. These, in turn, caused occasionally outdated information being sent to the clients, showing outdated files – a big issue for real-time collaboration.

In discussion with Nextcloud engineering, it was decided to abandon the test setup, and instead migrate the existing ownCloud instance to the latest version of Nextcloud 13.0.1. This allowed DEGES their current setup:

- Using LDAP as user backend
- Allow external users to also have an account (normal DB users via the registration app)

As now the complex setup of two instances (one for LDAP and one for external user tied together via federation) was not needed anymore, DEGES went ahead with a setup consisting of a single cluster.

The systems were installed on a Debian Stable with Apache setup, and consisted each of:

- One HA proxy
- One MySQL server (itself a 2-node cluster)
- Two web application nodes,
- One NFS storage server.

There was a variety of technical limitations and performance limitations the team ran into with WebDAV and NTFS. They attempted to mount WebDAV on user systems but platform compatibility and technical issues got in the way.

A number of patches and configuration tweaks was applied with the help of Nextcloud support to bring performance up and improve the handling of WebDAV in Windows. On advice of Nextcloud DEGES is preparing a move to a recommended setup with clustered database and NFS as storage.

A small security improvement

DEGES used the notification application from the command line and noticed that in the output of PS on Unix, the username and password were visible while the command was running. A change was made in Nextcloud to allow passing the username and password via environment variables, hiding them from the command line. The credentials can be set using the `NOTIFY_USER` and `NOTIFY_PASSWORD` environment variables.

Conclusions

In hindsight, the team would have liked to run an even longer pilot phase to try out various combinations of storage solutions and ways to connect user systems to Nextcloud.

The team would like to see improved SAMBA integration in Nextcloud, including the ability to mount Nextcloud storage not only as WebDAV but through SMB.

Currently, about 2,000 users have access and use Nextcloud, with more expected to start using the service over time.

Integrated solution: project management improvements

During the DEGES pilot testing of Nextcloud, IT installed the Nextcloud Deck app, a Kanban style project planning tool, at the time not officially supported by Nextcloud GmbH. The app quickly became popular with users, in particular in the management team, and it was decided to set up a professional services project with Nextcloud to improve the Deck app.

In the first project, the Deck app was expanded to add the ability to attach files to tasks. This simplified the workflow of reviewing and finalizing documents. Additionally, the Deck app gained check list support and other improvements during that time. The work happened entirely in the open, something the DEGES team was eager to pursue. This gave the benefit

of a fast feedback loop and help in testing and even code and review from community volunteers, speeding up development.

After successfully finishing the project, DEGES has started a new consulting project with Nextcloud GmbH to improve the integration of comments with Deck.

Going forward

As an organization, DEGES is working towards a 5D BIM, a method of intelligently linking design components with schedule and cost constraints.

Jens Düssel: "Working in the cloud and file sharing can be seen as a preliminary stage for working with BIM methods. Employees must first learn to work together internally and externally in one storage location, breaking down workplace silos."

In a way, Nextcloud is meant to fill the gap in between their existing solutions and the future aim of BIM, sometime in 2030.

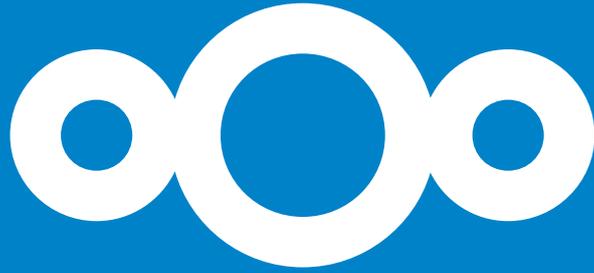


On the right track with EFSS and CCP

"With the introduction of the cloud as a strategic, company-wide content collaboration platform, we have created the technical basis for many more successful years and transport infrastructure projects", summarizes Jens Düssel.

DEGES benefits from the flexibility of the organisation and the cross-divisional and cross-location cooperation. Other branches - such as the new Düsseldorf branch - can be integrated into the existing infrastructure without detours. For the individual employee, the noticeable added value lies in daily project work: uniform, familiar structures in all projects, complete context-related information and the elimination of manual routine activities.

"Our increasingly digital, decentralized workflows are on the right track. I am looking forward to the next steps", Jens Düssel concludes.



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