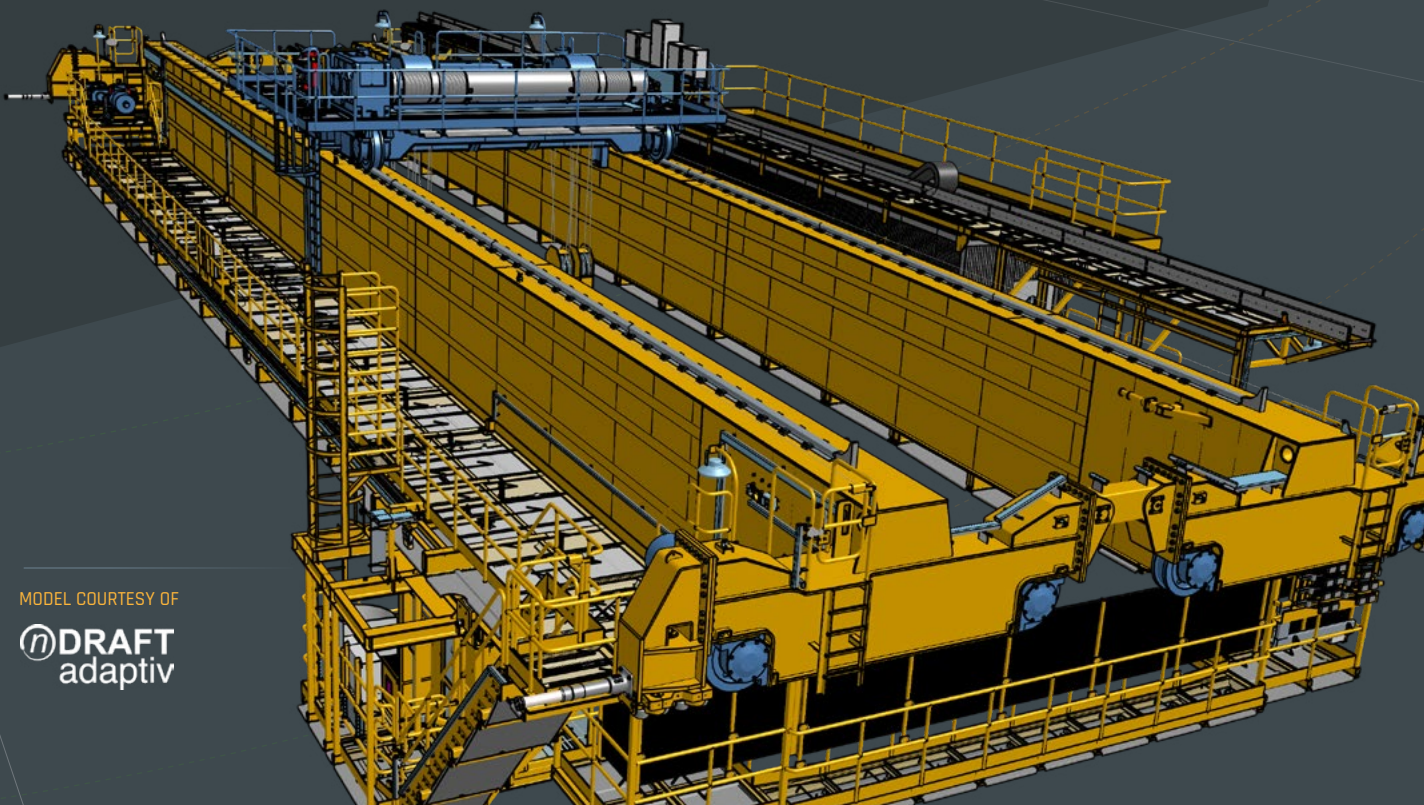


HOW TO MAKE THE MOVE TO CLOUD-NATIVE CAD AND PDM



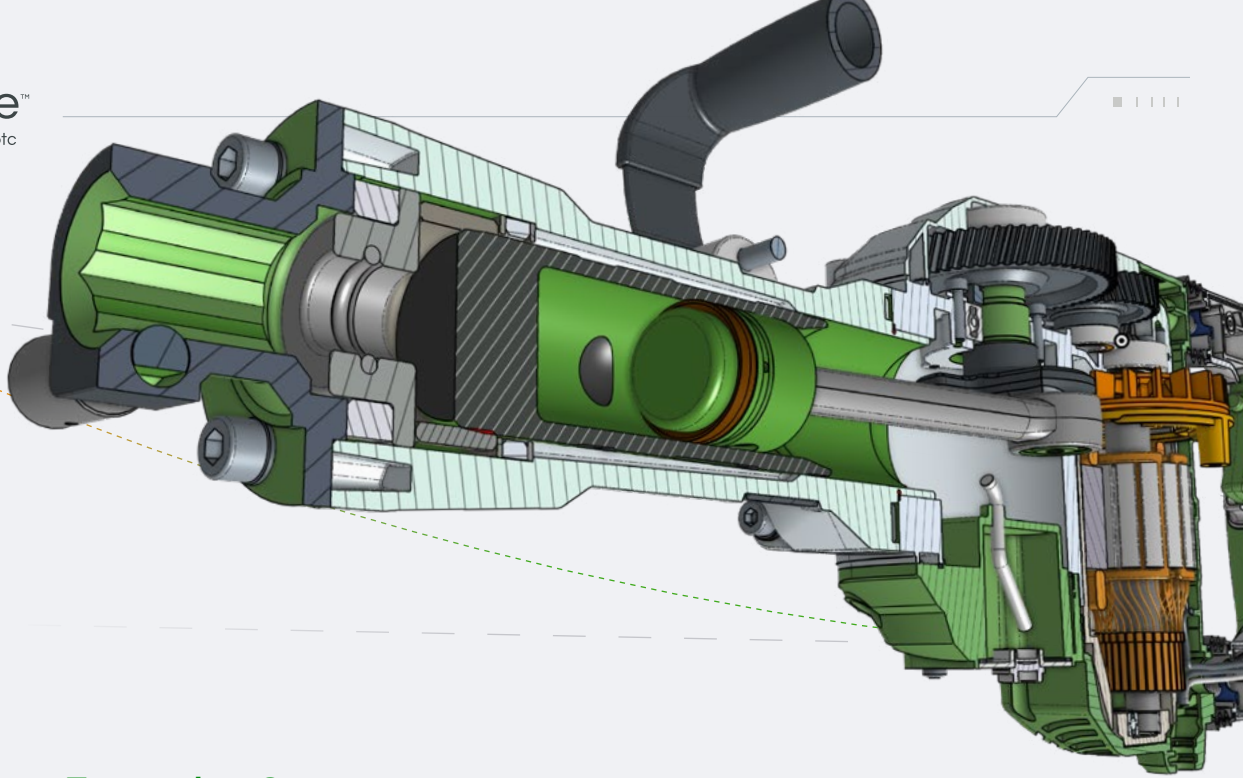
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Executive Summary

Industries such as manufacturing, automotive, and energy have traditionally relied on rigid, monolithic, on-premises CAD and PDM systems. These systems provide control over data and infrastructure but come with significant limitations—especially for small and medium-sized businesses. As a result, these legacy solutions can be costly, complex, and difficult to scale, hindering teams' ability to innovate rapidly and work collaboratively.

As businesses evolve, the need for more agile, scalable, and collaborative solutions has become paramount. The shift to hybrid cloud approaches introduced some benefits, such as using the cloud for storage and collaboration, but the complexity of synchronizing between on-premises and cloud infrastructure remained a major bottleneck. In addition, traditional CAD and PDM solutions lack the flexibility required to adapt quickly to changing production demands or market conditions, limiting an organization's ability to innovate efficiently.

Cloud-native CAD and PDM solutions, such as Onshape, present a comprehensive way forward. Built from the ground up for the cloud, these solutions eliminate the need for expensive local hardware, offering scalability and real-time collaboration to teams of all sizes. With enhanced version control, improved reliability, and seamless integration capabilities, cloud-native platforms empower engineering and design teams to innovate faster, optimize workflows, and stay competitive.

Transitioning to cloud-native solutions through a well-planned assessment and migration strategy ensures companies can overcome the inefficiencies of legacy systems and unlock the full potential of modern technology.

CHAPTER 1

The Rise of Cloud-Native Solutions

Cloud-native solutions - solutions built from the ground up for the cloud, have already disrupted how software solutions are developed and delivered today. It has transformed how we drive, look for ride shares, order food, watch television and more.

In industrial applications, the rise of cloud-native solutions is driven by the need for enhanced efficiency, scalability, and responsiveness within sectors that have traditionally been reliant on legacy systems.

Industries such as manufacturing, automotive, and energy are increasingly adopting cloud-native technologies as a strategic measure to streamline operations, bolster predictive maintenance, and optimize supply chains. Industrial enterprises are transitioning away from rigid, monolithic architectures in favor of more adaptable frameworks. This shift enables them to rapidly respond to fluctuating production demands and evolving market conditions, fostering an environment of continuous adaptivity and improvement.

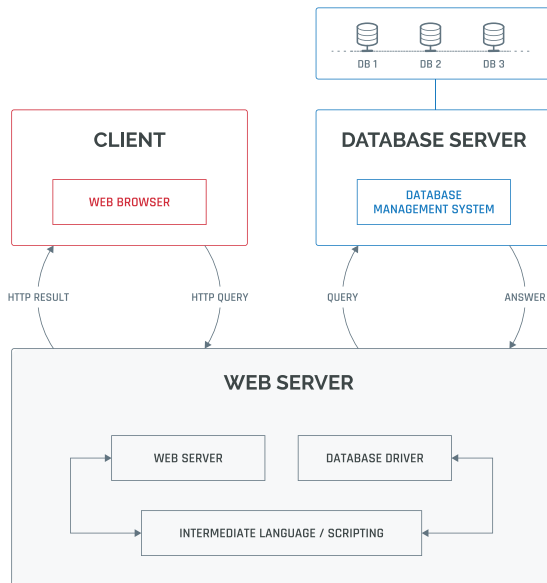
Cloud-native solutions empower design and engineering teams by enabling more dynamic, responsive workflows. These teams can effectively manage design iterations in an agile manner, allowing them to make informed adjustments throughout the development process with minimum downtime. This accelerates innovation cycles, and enhances productivity of the design team.

“**Harmonizing data and workflows from initial product design through to manufacturing**” cited by **70% of manufacturing leaders as a top challenge.**

source: [Accelerate Future Manufacturing Transformation With The Industrial Metaverse.](#)

CHAPTER 2

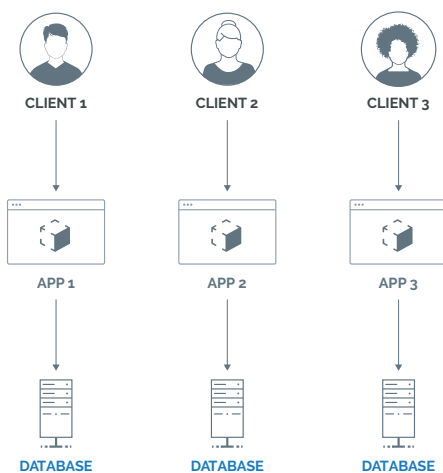
The Current State of CAD and PDM



Typical three-tier architecture of On-premise systems prohibits customizations through API

Traditional On-Premises Solutions

Traditionally, CAD (computer aided design) and PDM (product data management) systems have been deployed on-premises, with individual users running file based CAD on their local machines while using PDM software installed on local servers and storage. This approach offers companies full control over their data and infrastructure. However, on-premises PDM software have a high upfront development costs and infrastructure needs. Thus, on-premise CAD and PDM integration has generally been out of reach for small and medium-sized businesses. Large enterprises have been the primary adopters of on-premises PDM due to the significant IT resources and budgets required.



Single tenant architecture leads to an unsustainable model

Hybrid Cloud Approaches

More recently, some companies have adopted hybrid cloud approaches for their CAD and PDM needs. This involves maintaining some on-premises infrastructure while leveraging cloud services for specific functions like collaboration or data storage. Hybrid approaches offer a middle ground, allowing companies to maintain control over sensitive data on-premises while taking advantage of the scalability and accessibility of the cloud. However, hybrid setups can introduce complexity in data management and synchronization between on-premises and cloud systems.

Versions and history

Search history

Name	Modified
Main > 37 changes	Sandeep Urankar 4:37 PM Nov 25
B3 ✓ 12 changes	Sandeep Urankar 2:35 PM Nov 24
BOM : Assembly 2 :: Change...	
Delete tab : Feature Studio1	
Automatic update	
Wiper-Components-full :: Hi...	
Wiper-Components-full :: Hi...	
Wiper-Components-full :: Hi...	
Wiper-Components-full :: U...	
Wiper-Components-full :: M...	
Insert new tab : Feature Stu...	
Delete tab : Render Studio	
Render Studio :: Initialize Re...	
Insert tab(s) : Render Studio	
Merge from B3	Sandeep Urankar 10:56 AM Nov 20
> Show changes...	10:53 AM Nov 20
Assembly 2 :: Show : Part 4...	Sandeep Urankar
> Show changes...	10:09 AM Nov 20
V3	Sandeep Urankar
> Show changes...	1:27 PM Nov 19
B2	Sandeep Urankar
> Show changes...	10:57 AM Nov 19
B1	Sandeep Urankar
> Show changes...	10:57 AM Nov 19
V2	Sandeep Urankar
> Show changes...	7:05 AM Nov 19
V1	Sandeep Urankar
> Show changes...	1:21 PM Nov 18
Start	Sandeep Urankar

Workspace Version Change
 Release candidate Release Contains obsolescence

Infinite restore enabled by cloud-native CAD

Cloud-Native Solutions

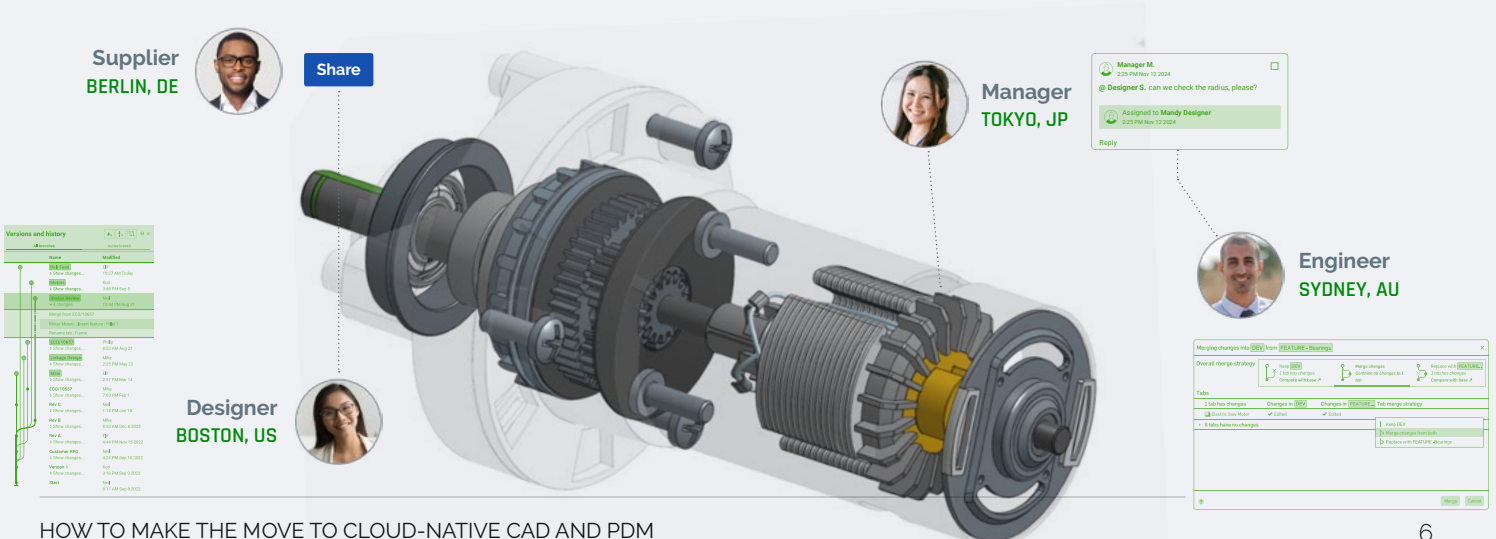
Cloud-native solutions are designed from the ground up for the cloud, eliminating the need for local hardware. Instead, all hardware is owned and maintained by cloud service providers (CSPs), which allows even small organizations to access the latest technology without any upfront investment.

Cloud-native solutions are inherently scalable, expanding as teams and workloads grow, and are built to be fault-tolerant, ensuring reliability. Solutions like Onshape, which offer cloud-native CAD and PDM capabilities, use a multi-tenant architecture that enables multiple users to collaborate directly in real-time on CAD data.

With cloud-native solutions sophisticated Git-like version control systems become possible, allowing for tracking of every change to the product design and infinite rewind. Creating parallel branches for concurrent development projects becomes feasible.

Cloud-native platforms also typically offer a well-documented REST API, fostering open ecosystems for web applications to interact seamlessly with CAD data.

Despite their advantages, cloud-native solutions face unique security challenges. Cloud-native vendors address these concerns through robust encryption, strict access controls, and adherence to industry security standards to protect sensitive information effectively.



Supplier
BERLIN, DE

Manager
TOKYO, JP

Designer
BOSTON, US

Engineer
SYDNEY, AU

Share

Manager M.
2:55 PM Nov 12 2024
@ Designer S.: can we check the radius, please?
Assigned to Mandy Designer
2:55 PM Nov 12 2024
Reply

Overall merge strategy: Merge
 Last two changes
 Custom merge strategy
Table: Table
 Table history changes
Merge strategy: Merge
 Custom merge strategy
Merge strategy: Merge
 Custom merge strategy
Merge strategy: Merge
 Custom merge strategy

CHAPTER 3

How to Make The Move To Cloud-Native

The first step in your journey to cloud-native is to **assess your current CAD and PDM infrastructure** to identify pain points and opportunities for improvement.

This assessment should include:

- Evaluating the performance, scalability, and collaboration capabilities of existing tools
- Identifying bottlenecks and inefficiencies in current workflows
- Assessing the costs associated with maintaining and upgrading on-premises systems
- Gauging user satisfaction and gathering feedback on desired improvements

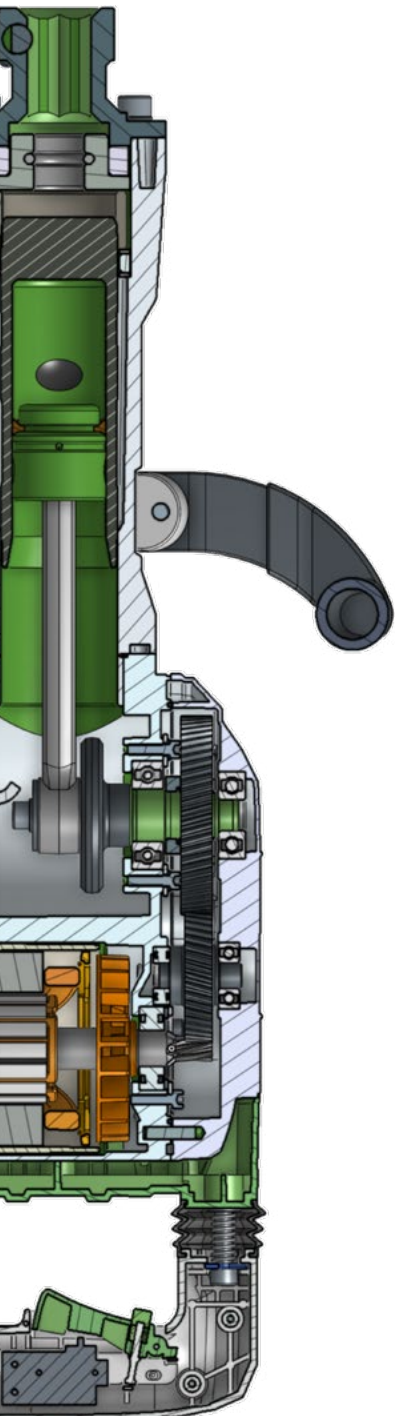
This assessment will provide a baseline understanding of your current state and help build the case for moving to a cloud-native solution.

With a clear understanding of your current challenges and requirements, the next step is to **evaluate the landscape of cloud-native CAD and PDM vendors and solutions**.

Key factors to consider include:

- Breadth and depth of CAD functionality and supported file formats
- Robustness of built-in PDM capabilities, including version control and access management
- Ease of use and intuitiveness of the user interface
- Performance and scalability of the cloud infrastructure
- Integration capabilities with other business systems and processes
- Pricing models and total cost of ownership

It's important to engage with multiple vendors, request demos and trials, and gather feedback from end-users to ensure the selected solution meets your specific needs.



Once you've selected a cloud-native platform, you'll need to **develop a detailed migration strategy**. A well-planned migration strategy will help ensure a smooth transition and minimize risk.

This should include:

- Identifying which products, projects, and data to migrate first
- Mapping out a phased approach to minimize disruption to ongoing work
- Defining data migration processes and tools
- Establishing integrations with other systems and processes
- Setting timelines and milestones for each phase of the migration



Learn how Onshape handles security, privacy, data protection, administration, enterprise integration and more.

GET THE EBOOK

Security and compliance are critical considerations when moving CAD and PDM to the cloud. Leaders must work closely with their cloud vendors to ensure that:

- Data is encrypted in transit and at rest
- Access controls and authentication measures are robust and granular
- Compliance with industry-specific regulations (e.g., ITAR) is maintained
- Incident response and disaster recovery plans are in place
- Regular security audits and penetration testing are conducted

Finally, leaders must **plan for user training and adoption to ensure a successful rollout** of the new cloud-native tools.

This should include:

- Identifying key user groups and their specific training needs
- Developing a comprehensive training program, including in-person sessions, webinars, and self-paced learning resources
- Establishing a support structure for ongoing questions and issues
- Defining metrics for measuring user adoption and satisfaction
- Celebrating successes and sharing best practices across the organization

By investing in user training and adoption, leaders can help ensure that the benefits of cloud-native CAD and PDM are fully realized.



LEARN MORE >

CHAPTER 4

Who's Already Made the Move to Cloud-Native CAD and PDM

25% - 50%

productivity gain due to automatic version control and accelerated collaboration

Saved

15 engineering hours per week that was previously lost by file-based CAD

Zero

risk branching and merging allow the team to explore alternatives and merge ideas without altering the main design

[READ MORE](#)



80% reduction

in design time by eliminating repetitive tasks

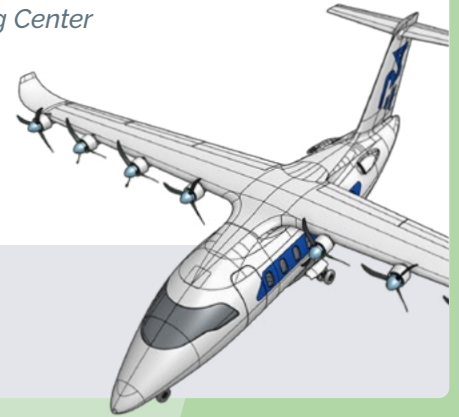
Enterprise

access to core CAD Models for sales, quality control, environmental team, and the manufacturing floor

3 Days

to onboard a new team with the self-paced Onshape Learning Center

[READ MORE](#)



Instant

access to design changes

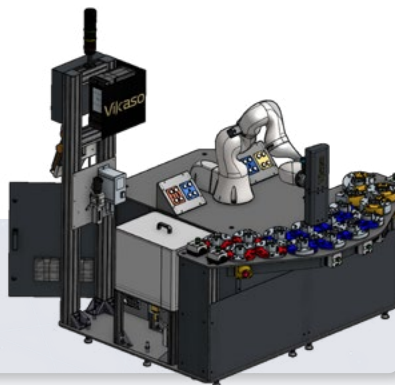
50%

saved on hardware costs by adopting Onshape's device-agnostic platform

70%

faster communication with Onshape's real-time collaboration tools

[READ MORE](#)



400+

engineering hours saved in a year with FeatureScript

Automated

task of modeling an electric battery pack

Prevents

version control problems for design team with built-in PDM

[READ MORE](#)





onshape™
by ptc

Onshape is the leading cloud-native CAD & PDM software that runs on any device, anywhere - requiring zero IT.

Onshape is for product design companies who are fed up with errors, time waste, and hidden costs of outdated file-based CAD & PDM.

Only Onshape:

- Guarantees engineers never lose data by eliminating CAD crashes.
- Provides engineers with infinite restore of previous designs with git-like version control.
- Enables engineering teams to collaborate securely, in real-time, or work on concurrent projects with git-style branching and merging.

DISCOVER ONSHAPE

