

UNIVERSITY OF COLORADO TAKES A HYBRID JOURNEY TO THE CLOUD

CU Denver focused on two critical areas to begin its modernization efforts, reducing costs and improving security and performance along the way.

Like many educational institutions, the University of Colorado Denver/Anschutz Medical Campus (CU Denver) needed to modernize its IT infrastructure. But a wholesale migration to cloud wasn't an option for the large public research university, which includes two campuses — one in downtown Denver and the other in neighboring Aurora. When the university needed to refresh hardware for several on-premises database servers, IT leaders knew there had to be a better way. Hybrid was the answer.

A hybrid approach to cloud, which combines both on-premises and cloud systems, would allow CU Denver to reap the benefits of newer technology while ensuring existing applications — even those that were heavily customized — could still be used. It would also allow the university to set the stage for a series of incremental steps toward IT modernization.

Moving IAM to the Cloud

The university approached its IT modernization efforts from two fronts. The first effort was to address a complex challenge CU Denver and many other universities face: identity and access management (IAM).

“Like a lot of academic institutions, we have a complex IT environment,” says Chris Edmundson, program manager in CU Denver’s Office of Information Technology. “We’re dealing with students, the business office, the registrar, the medical school, the hospital... Our challenge is to do a good job of identifying patterns

because everyone has different access needs based on their role or roles.”

In all, CU Denver maintains more than 355,000 identities and 187 applications. Schools and departments must ensure users can access the applications they need without inadvertently enabling them to access applications or data they shouldn’t. CU Denver used an on-premises solution in its own data center and a combination of products, including Oracle Identity Manager (OIM), Oracle Service-Oriented Architecture (SOA) and Oracle Access Manager, to handle identity and access management.

“We would receive data from our HR and student information systems, analyze the data and make decisions based on role,” explains Edmundson. “We had gotten it down to a pretty good science over the years, but the data is very dynamic, so keeping track of it all with on-premises technology was not easy.”

In 2019, with the help of Arisant, a technology and professional services consulting firm that helps companies solve technology challenges using Oracle solutions, CU Denver began to move Oracle Access Manager to Oracle Identity Cloud Services (IDCS).

“Our rationale was high availability, fault tolerance and lower overall total cost of ownership,” says Edmundson. “It would also make everything much easier for us to manage.”

The university migrated to IDCS in six months, and the new system went live in May 2020. Thus far, CU Denver has migrated 180 applications to IDCS. OIM, which is responsible for provisioning



employee and student access, remains on-premises for now because IDCS is not yet on par with OIM for provisioning. Instead, OIM is communicating to IDCS in the Oracle Cloud using an OIM-to-IDCS Cloud Connector. Additional components of the university's IAM, including SOA workflows, a newer version of OIM and password reset functionality, are slated to move to the cloud in a second phase.

CU Denver also built a cloud native data model for university identities using Oracle Golden Gate and Oracle Data Integrator. The university plans to make this data model the foundation for IAM going forward.

"If everything goes smoothly, we'll have most of our operation running in the cloud in the next year or two," says Edmundson.

For CU Denver, that means lower costs, better disaster recovery capabilities, improved availability, enhanced security and the ability to reap the benefits of modern technology.

"The cloud allows us to leverage many of the nifty new technologies," says Edmundson. "We could invest a lot of time creating on-prem tools to perform these functions, or we could just do it in the cloud. We decided it was going to be a lot more efficient to move to a cloud-based solution. Our ability to keep up with the latest and greatest technology is a hundred-fold now."

From Three Systems to One

The second part of CU Denver's modernization efforts involved consolidation of multiple disparate database systems hosted by different departments. When the central Office of Information Technology, the School of Dental Medicine, and the Research and Shared Services division were all due for a hardware refresh around the same time, it presented an opportunity to consider how the decentralized departments could better collaborate and consolidate.

"We performed a cost analysis and reviewed the short- and long-term benefits to consolidating," says Bob Schell, director of Research and Shared Services for CU Denver's Office of Information Technology. "Some of those benefits were cost savings and improved operational efficiencies. But we also believed by consolidating and moving to the cloud we could improve our security posture, scalability and performance."

In late 2020, again with the help of Arisant, the three departments consolidated on two on-premises Oracle Exadata Cloud at Customer systems.

"Rather than all three of us having our own infrastructure, we moved to one piece of infrastructure at a reduced cost," says Schell.

Separating each department into different clusters, or "private Exadata cloud services," allowed them to consolidate yet keep each individual IT environment independent from each other. This was especially important given that the School of Dental Medicine and the Research and Shared Services OIT division are both subject to HIPAA compliance.

"Being a medical campus, HIPAA compliance is critical to us," says Schell. "Relying on Oracle to provide infrastructure support was certainly a load off of us in that area and streamlined our compliance efforts."

For Schell's Central Office of Information Technology in particular, improved operational efficiencies means more personnel resources are now available to assist the individual schools, centers and departments the department supports throughout the university.

"Everybody in our department can do their jobs more efficiently," says Schell. "That translates to service improvements for our stakeholders. While we had some performance concerns and complaints before, those issues have been fully mitigated today and significant performance improvements are being realized."

The move to Oracle Exadata Cloud at Customer is viewed as a strategic steppingstone for eventually moving more CU Denver systems to the cloud. But for now, a hybrid cloud strategy is "a perfect fit" for the university, says Schell.

Ultimately, both IT modernization efforts are about taking a smarter approach to how CU Denver performs its critical activities.

"We want to do as much as possible for as many people as possible for as few dollars as possible," says Schell. "Sharing resources and funding streams and moving to more efficient and effective IT systems is a key way we can crack that nut."

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