

Notre Dame is mastering backup and recovery solutions for continuous uptime

A historic institution protects critical assets on AWS

The University of Notre Dame, a 176-year-old private research university in South Bend, Indiana, is one of the nation's top religiously affiliated schools. It also happens to contain one of the most sought-after places to work in IT:¹ The university's Office of Information Technologies (OIT) has been ranked as one of the top places to work in IT for five years running.

The OIT is tasked with protecting enterprise-wide computing on campus, including tasks related to university employees, staff, and its large body of students. The OIT currently protects over 600 AWS instances (it will reach 700 by the end of 2018); four Amazon Relational Database Service (Amazon RDS) instances; and two accounts. One of their two accounts is AWS GovCloud (US)—an isolated AWS region that allows U.S. government agencies and customers to move sensitive workloads into the cloud by addressing their specific regulatory and compliance requirements.

¹ [ND ranks in Computerworld 2017 best places to work](#)

Leading the way to the cloud

With such a large population depending on them, the OIT wanted to ensure that the [nd.edu](#) site could handle traffic spikes or unforeseen circumstances with absolute reliability. It load-tested the university's website, and when it failed, the OIT turned to AWS and N2WS Software (N2WS) for a solution.²

Notre Dame was in search of rock-solid reliability for good reason. The university uses an Enterprise Resource Planning (ERP) system, Banner, that integrates with virtually all the university's applications. A failure would impact every single person who interacts with the university's site, including its 240 IT staff, its 6,000 employees, and its 12,000 students. Should the system fail, the OIT would spend weeks recovering data, requiring all-hands-on-deck for 12-hour shifts and taking up time better spent on other strategic projects. Notre Dame faculty wouldn't be able to access online teaching resources; payroll wouldn't be able to pay staff; and students wouldn't be able to see grades, access class locations, or manage financial aid.

With so many dependencies, any downtime would be catastrophic.

"It would be like being in the middle of the ocean without oars or sails. Dead in the water," explains Aaron Wright, systems engineer at the University of Notre Dame.

The university's decision to go with N2WS was no coincidence. "They offered a flawless solution that's reliable," says Wright.

² [How Notre Dame is going all in with Amazon's cloud](#)

N2WS Cloud Protection Manager

Moving to the cloud is just the first step in protecting your business's sensitive information. The second would be finding the tools necessary to maintain continuous uptime. Cloud Protection Manager is a N2WS backup solution built specifically for AWS that allows teams to recover data in a fraction of the time it would take using traditional backup solutions. It leverages native AWS technologies to utilize block-level and incremental snapshots for easy, near-instant recovery, helping keep data safe and businesses running smoothly.

N2WS helps you:

- Back up data as often as necessary with incremental snapshot technology.
- Ensure reliable, crash-consistent backups.
- Recover entire EC2 instances and volumes across other AWS accounts or regions.
- Fine tune instance recovery, including VPC subnets, IP addressing, security groups, and keys.
- Rapidly recover from compromised accounts and region-wide issues.

Cloud-first mentality

In 2014, Notre Dame built the smallest possible web servers to host nd.edu—auto scaling up during peak demand and shutting down administrative systems over the weekend when staff were at home.³

Month-to-month billing from N2WS allowed Notre Dame to migrate at its own pace: The university could purchase what it needed, when it needed it without tying backups into a proprietary format. By 2016, about 60% of Notre Dame's IT systems were in the cloud, including parts of its business management software.

Notre Dame's N2WS-protected environment has grown 2900% since 2015—from 25 instances to up to 750.

Today, Notre Dame is considered the first nationally recognized university to come out full force as a cloud-first organization, with more than 80% of its IT systems housed on the cloud. By the end of 2018, the university plans to have migrated any remaining data to the cloud and close its primary data center.

³ [Cloud first leaders: The University of Notre Dame](#)

Near-instantaneous recovery during a bad patch

Notre Dame's continuous adoption of an N2WS and AWS solution is a result of its earned trust—and with good reason. In March of 2018 the university's applications team rolled out a patch on a production server only to discover an issue two weeks later.

University of Notre Dame engineers were easily able to locate the issue by looking at the snapshot's description on the console. This naming convention allowed them to quickly identify and detach the corrupted Amazon Elastic Block Store (Amazon EBS) volume, manually create a new one from the snapshot, and attach it to the instance—all without requiring assistance from a backup administrator.

"If it had been on premises, it could easily have been an hour or more. Using Cloud Protection Manager, it took five minutes," says Wright.

Wright calculates that the university is spending 25% less time by using a centralized backup solution by N2WS. As a cloud-native backup tool purpose-built for AWS, N2WS is especially fast.

"Moving data in and out of the cloud would take much longer. We have six engineers managing 100 machines each who would take an hour a day to back them up manually. Because the Amazon EC2 attributes are stored within the database we can restore in minutes. We're not obligated to take time out to track down bits and pieces of information."

The N2WS solution is just as efficient with single file restores.

"Just this morning, I did a single file restore for a Windows server that had a three TB drive," explains Wright. "Using N2WS, I was able to find the lost folder and restore it to the source destination in five minutes as opposed to 30."

Challenge

The University of Notre Dame needed to ensure that its operational systems would remain up and running for its students, faculty, and employees—even in the event of an emergency.

Solution

N2WS restores Amazon Elastic Compute Cloud (Amazon EC2) instances in seconds by recovering snapshots stored in Amazon Simple Storage Service (Amazon S3). Instead of carving out time for maintenance, the university can continue business as usual.

Results

Notre Dame is protected from virtually any outage in a fraction of the time it would take a traditional on-premises solution. By maintaining consistent uptime, the university protects its students from educational disruption, allows teachers to access their online educational materials, and saves the IT department valuable time.

Securing the university's data means securing its future

N2WS provides the university with the flexibility to respond quickly to business demands for continuous uptime every day, all day, for students, faculty, and staff.

N2WS enables Notre Dame to:

- Save up to 25% of time previously spent on manual backups.
- Recover entire Amazon EC2 instances across local and global regions within seconds.
- Apply N2WS's backup blueprint to AWS GovCloud (US) for Federal, State, and Local government protection.

Having instigated a solid backup and recovery solution, the university can spend more time and resources on the implementation of its cloud-first strategy, confident that their environment is reliably protected, allowing students and faculty to focus entirely on a top-rate educational experience.

Fast and reliable from start to finish

Not only does N2WS allow teams to back up data as often as needed and recover it more quickly than traditional on-premises backup solutions, but setup is speedy as well.

"Had we needed to develop a new backup and recovery solution, test it, put together a development team and put it into production, we would have easily spent 4,000 hours. N2WS took between thirty minutes to an hour to set up," explains Wright.

"With N2WS in place backup administrators are available to concentrate on other cloud projects."

Aaron Wright
Systems Engineer, University
of Notre Dame



About N2WS

N2WS is dedicated to creating "cloud-native" solutions for protecting workloads and data hosted in AWS. It adopts the AWS paradigm for backup and storage, proving customers with confidence that their data is regularly backup up and can be recovered in mere seconds in the event of an outage or failure.

Learn more about [N2WS on AWS](#).