nClouds | AWS Case Studies

California Department of Water Resources (DWR)

How nClouds helped the California Department of Water Resources build a highly secure architecture with department-wide accessibility and unlimited storage to deliver customizable data with low latency.

CALIFORNIA DEPARTMENT OF WATER RESOURCES

Industry

Public Sector, Government

Location

San Francisco, CA

Challenge

Build a highly secure architecture with department-wide accessibility and unlimited storage to deliver customizable data with low latency.

Featured Services

DevOps, Application Modernization, Data & Analytics, Security

About the California Department of Water Resources (DWR)

Established in 1956 by the California State Legislature, the California Department of Water Resources (DWR) is part of the California Natural Resources Agency. The DWR is responsible for the protection, management, conservation, development and regulation of the State of California's water usage. This includes the State Water Project (SWP), the nation's largest state-built water conveyance program. For more information, visit www.water.ca.gov

Benefits Summary

| Enhanced user accessibility | Virtually unlimited storage capacity | Low latency | Customizable content delivery |

Challenge:

Build a highly secure architecture with department-wide accessibility and unlimited storage to deliver customizable data with low latency.

Why AWS and nClouds

The State of California uses AWS as its primary cloud service provider. The California Department of Water Resources (DWR) requested help from AWS to optimize specific applications. An AWS Account Manager referred them to nClouds, an AWS Premier Consulting Partner. nClouds then worked in collaboration with the AWS and DWR DevOps teams to create a dynamic architecture that fulfilled DWR's specific needs.

aws partner network

Premier
Consulting Partner

AWS CloudFormation
Data & Analytics Competency
DevOps Competency
Immersion Day Partner
Marketplace Seller

aws partner network

Premier
Consulting Partner

Migration Competency
MSP Partner
Public Sector Partner
SaaS Competency
Well-Architected Partner Program

California DWR leveraged several Amazon Web Services:

- **Amazon CloudFront (CloudFront)** - A large-scale, global, and feature-rich CDN that provides DWR with secure, scalable, and intelligently integrated application delivery.

- **Amazon Cognito** - Lets DWR add user sign-up, sign-in, and access control to its web and mobile apps quickly and easily. It scales to millions of users and supports sign-in with social identity providers such as Facebook, Google, and Amazon, and enterprise identity providers via SAML 2.0.

- **Amazon Route 53** - A highly available and scalable cloud Domain Name System (DNS) web service that provides a reliable and cost-effective way to route DWR's end users to internet applications.

- **Amazon Simple Storage Service (Amazon S3)** - A flexible way to store and retrieve data, providing DWR with cost optimization, access control, and compliance.

- **AWS CloudFormation (CloudFormation)** - Allows DWR to treat its infrastructure as code, automate operations, and bring up new environments.

- **Lambda@Edge** is a feature of Amazon CloudFront that lets you run code closer to users of your application, which improves performance and reduces latency.

> " We needed to streamline the authentication of our department's access to critical information on California's levees. AWS recommended that we work with nClouds because of their AWS and DevOps expertise. nClouds developed an elegant and effective automated solution to handle increased traffic."
>
> **David Julian**
> Water Resources Engineer, California Department of Water Resources

nClouds' Solution Architecture for California DWR

The following architectural diagram shows the elegant solution developed by the nClouds team in collaboration with California DWR. This structure sits on top of an existing data repository and incorporates availability with speed and user accessibility.

The nClouds team automated the construction of DNS infrastructure with Route 53 Resolver endpoints using AWS CloudFormation. Route 53 sends automated requests over the internet to a resource, such as a web server, to verify that it's reachable, available, and functional. Amazon CloudFront delivers the requested data from edge locations, resulting in lower latency, which translates to greater speed. And, since the end users are government employees spanning many different office locations in the State of California, AWS Cognito "federates" all user identities, making it easier for departmental employees to access the necessary site information. An elegant and effective architecture.

High-level architecture diagram:
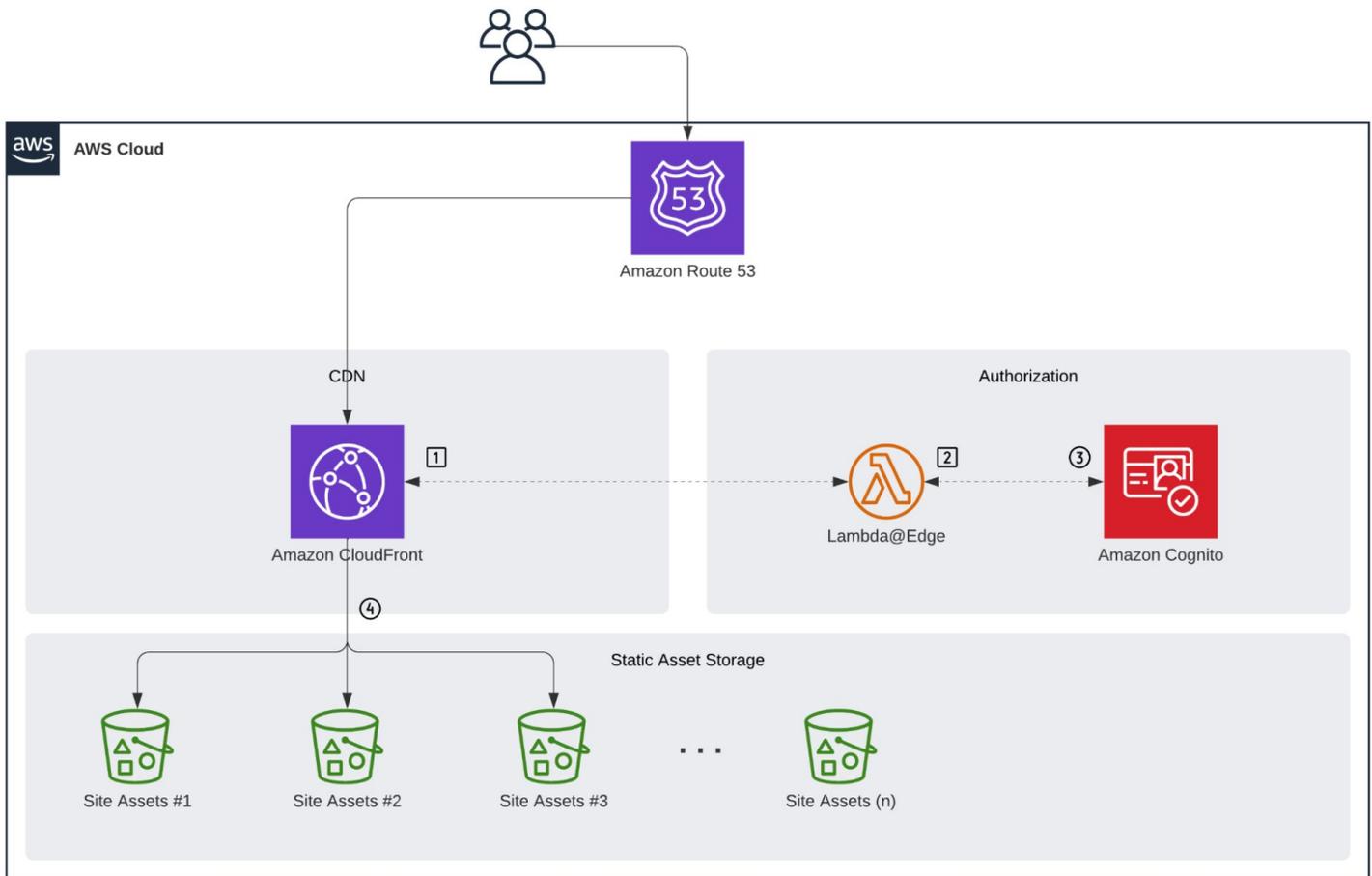
The Benefits

Teaming with nClouds, the California Department of Water Resources now has an enhanced, low-latency data-delivery system, with federated identity authentication. The project has yielded numerous benefits:

Enhanced user accessibility

Amazon Cognito provides federated user authentication through social identity providers such as Facebook, Twitter, or Amazon, with SAML identity solutions, or by using your own identity system.

Virtually unlimited storage capacity

Amazon S3 storage service offers an extremely durable, highly available, and infinitely scalable data storage infrastructure at very low costs.

Low latency

The combination of using Amazon S3 in conjunction with Amazon CloudFront is a winning combination that delivers low latency, which translates to increased speed.

Customizable content delivery and scalability with Lambda@Edge

The CA DWR data can be customized and used for flood control, levee maintenance, agriculture needs, and disaster operations. For example, secure, descriptive captions can be inserted with any levee picture. By combining Lambda@Edge with other AWS services, developers can build powerful web applications at the edge that automatically scale up and down—with zero origin infrastructure and administrative effort required for automatic scaling, backups, or data center redundancy. To learn more: https://aws.amazon.com/lambda/edge/

About nClouds

nClouds is a certified, award-winning provider of AWS and DevOps consulting and implementation services. We partner with our customers, as extensions of their teams, to build and manage modern infrastructure solutions that deliver innovation faster. We leap beyond the status quo.

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