CLUSTERCONTROL

MAKES MYSQL ENTERPRISE-

GRADE AT BLACK HILLS CORP

BLACK HILLS CORPORATION
- Industry: Energy
- Location: United States of America
- Data Center: Two in different states

USE CASE
Adding an Enterprise-ready Database Cluster to an existing SQL Server & Oracle Infrastructure across multiple data centers.

WHY SEVERALNINES
Centralized software solution to quickly deploy and easily maintain a new technology that's production ready.

INTRODUCTION

Black Hills Corporation is a customer-focused, growth-oriented utility US company with a tradition of improving life with energy and a vision to be the energy partner of choice.

Based in Rapid City, South Dakota, the company serves 1.2 million natural gas and electric utility customers in eight US states: Arkansas, Colorado, Iowa, Kansas, Montana, Nebraska, South Dakota and Wyoming. The company also generates wholesale electricity and produces natural gas, oil and coal.

CHALLENGE

Black Hills Corporation, like many other large companies, manages large infrastructures of Microsoft SQL Server and Oracle. The database infrastructure consists of over 50TB of data across 1500 databases, and is managed by a team of DBAs.

Many systems considered non business-critical, however, run on MySQL. This included a number of web properties, as well as internal applications. The databases were traditionally not under any specific SLA, and little attention was given to the management of these. However, running disaster recovery tests two times a year, these non-critical

> ## "I nearly destroyed the cluster trying to resolve some of the early problems we encountered."
> Jordan Marshall, DBA Manager

system could be down for at least 12 hours each time. The extended downtime was becoming a bit of an issue, something that the IT team wanted to avoid.

The DBA team, who up to this point had not been managing the MySQL databases, also wanted to assume control of the open source technology while bringing them up to a higher standard of stability utilizing advanced clustering technology. After much research they decided on Galera Cluster as the technology of choice for this upgrade from the master-master replication which had been deployed prior.

While experts in Microsoft SQL Server and Oracle ExaData, no one on the team was an expert in MySQL. After spending time online researching, coupled with the database documentation, they were able to create, what they believed was, a production-ready cluster. Then the next step was to understand how to manage the system to ensure smooth operations. This meant visibility into database performance, as well as detection of anomalies. The system would be distributed across different datacenters, and it was important that any connectivity issues or failures did not jeopardize the integrity of the database. In case of failures, either of a single

node or of an entire data center, the team required a way to automatically fail over applications to available nodes.

Eventually, they took to the web to find a software solution capable of managing a large and complex cluster to achieve the following:

- *A production-ready Galera Cluster*

- *Ability to create and restore backups*

- *Automatic failover across multiple data centers*

- *An effective monitoring solution*

SOLUTION

The DBA team found ClusterControl online and began experimenting with it. Since they had already deployed a Galera cluster, the first step was to import it into ClusterControl. It immediately started throwing some errors with trying to perform certain management tasks on the cluster. Turns out a username and password were mismatched between nodes, something that was overlooked by the DBA team. This prompted the team to set aside the work they had already done and use the deployment functionality in ClusterControl to build a new cluster. It took their DBA ten minutes to deploy a production-ready Galera cluster with no errors, when previously it had taken hours to do. "Your software solved the lack of understanding with MySQL," said Jordan Marshall, Manager of Database Administration for Black Hills Corporation. "It's a nice handy tool that makes me feel confident that we can run this in a production environment."

ClusterControl checked all the boxes of their requirements. It provided multi-data center support, advanced automation, backup, and failover functionality and unified monitoring across their data centers.

To sell their management on the spend, Jordan provided an estimate of the labor cost for the manual setup as well as some custom scripting and tooling. The cost of ClusterControl was less, and that was before you factored in the cost of maintenance and upkeep of the databases. While cost is a factor, the time savings of ClusterControl's automation may have been even more important as time is a precious commodity for the DBA team.

NEXT STEPS

Due to the success of the migration of their MySQL replication stacks to Galera clusters and the confidence they feel toward ClusterControl, MySQL has moved up the list of their prefered database technologies to the number two spot, displacing Oracle. The company plans on exploring the idea of expanding their use of open source as a cost-effective solution for their business applications in an effort to reduce overall project costs while still utilizing ClusterControl and its enterprise-grade features to ensure performance and uptime.

"It's **phenomenal software**... I'm usually not impressed with vendors or the software we buy, because usually it's over promised and under delivered."

Jordan Marshall, DBA Manager

WHY SEVERALNINES?

There were many factors that lead Black Hills Corp to select Severalnines and ClusterControl as their MySQL solution.

Expert Support: "The thing that makes you stand out in my mind is your support. The support that I have gotten so far with the ClusterControl product is exceptional. Response times have been very quick and advice has always been very helpful in fixing my issues. I actually sent an email to the last guy that I had a support ticket open with and told them what a great job they do." said Jordan when highlighting the key reason for selecting Severalnines as their partner. "It's refreshing to actually get support that works and is timely."

An All-in-One Solution: Another key reason that Black Hills selected ClusterControl was because there really weren't any other unified solutions on the market for effective deployment, management and monitoring of open source database clusters. They would have had to cobble together scripts and multiple tools to achieve the same functionality.

Enterprise Grade: The Black Hills DBA team are experts in Microsoft SQL Server and Oracle DB and they felt ClusterControl's usability and feature set were on par. In fact, they have been able to add their entire team to ClusterControl and each have found it simple to get started and 'lend a hand' when troubles with the new MySQL cluster arise.