SaskWater Datacentre & Disaster Recovery Implementation

Until recently, SaskWater traditionally received IT support and application services from a shared services agreement with another government agency. This Agency provided and maintained all the IT infrastructure and applications as well as providing end user support.

Although this maintenance and support model did provide the infrastructure required for SaskWater to operate, a number of ongoing issues became apparent over time.

Ongoing Issues

- Complete reliance on third party (Agency) for all provisioning of network, server, and storage resources
- No established Service Level Agreements for network services, applications, nor end user support
- Complete reliance on Agency for end user support
- End user support calls could take weeks before being actioned, in many cases SaskWater Managers had to assist end users with support to help fill the gaps in service
- Complete reliance on Agency for application support on shared databases
- . No ability to budget IT expenses as support was billed on a per call basis
- No real DR strategy and backup solution in place
- No vision for the future

Partner Selection

Based on these ongoing issues and service concerns SaskWater decided to RFP for a partner to provide professional advice on the best approach for a new IT Infrastructure that would:

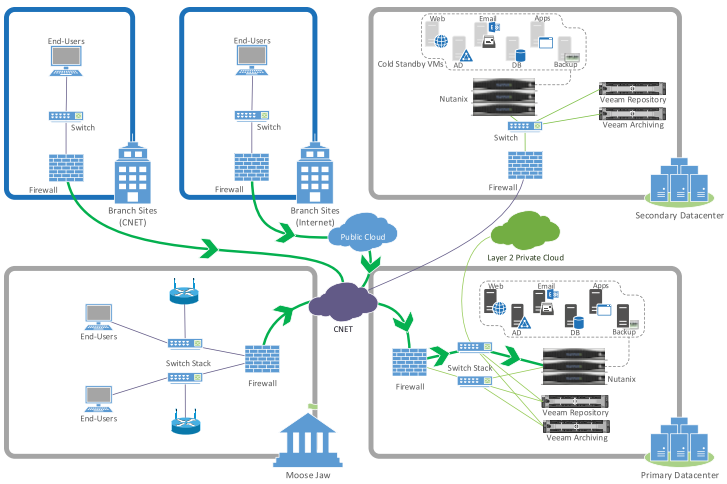
- Provide quality IT support
- improve service levels
- provision a primary datacentre
- focus on longer term IT requirements
- increase efficiencies
- provide capacity management
- provision a DR site
- provide ongoing management of the complete environment
- provide services on a fixed cost basis so that SaskWater can accurately budget their IT expenses

Based on our RFP response, WBM was ultimately awarded the contract to provide, implement, and deliver ongoing management of the primary and secondary datacentres, and as well provide complete lifecycle management of end user devices across the organization.

Solution Overview

The final design solution is a two data center design. The production data center (primary) is located in Regina with the secondary data center located in Saskatoon. The secondary data center is designed to be a warm site that can be spun up in a moment's notice.

There are also several different technologies used in this design that make it very redundant and resilient to failures, these technologies include the use of hyper-convergence, backups, replicas, failover vpn, failover DNS and highly available firewalls

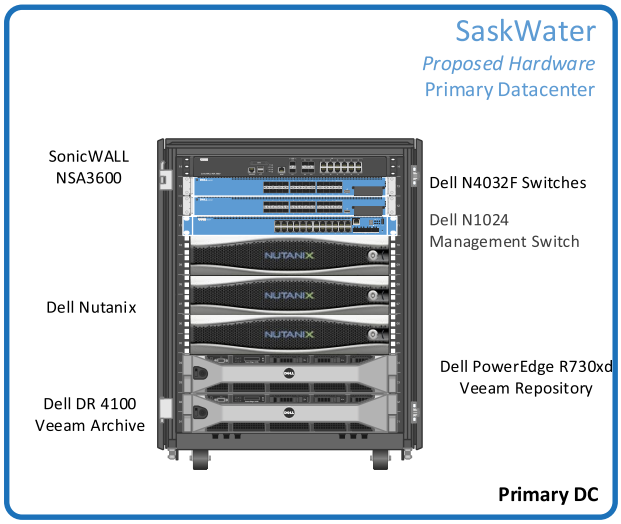


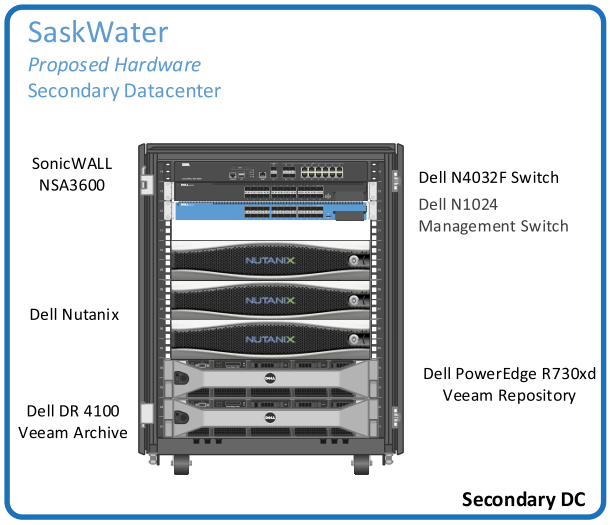
The other feature of this design, is that it is built with scalability in mind. Using technologies such as virtualization, hyper-convergence more compute resources can be added or removed very quickly.

In fact, during the course of the project, SaskWater was able to add an additional location with very little modification to the original deployment plan.

Technology Decisions

Hardware Chosen





Hyper-Converged Data Center

The solution chosen for SaskWater was a hyper-converged infrastructure on Dell Nutanix. Hyper-converged technology offers compute, network, storage and virtualization in a single unified package.

Nutanix is a leader in the hyper-converged datacenter market place.

THE BENEFITS REALIZED BY HYPER-CONVERGED TECHNOLOGIES

- Highly available
- Unified administration
- Scalable
- Reduced costs

Network Switches

Dell switches were chosen as part of this design because they represent best value in price vs performance. They are high performance, energy efficient and offer a very similar command set as other industry leaders.

The switches in the primary data center are configured as a redundant pair allowing continued operation in the event of failure of one of the switches.

BENEFITS TO SASKWATER

- Economical
- Energy efficient
- Simple to manage
- High availability
  (in the data center configuration)

Firewalls

SonicWall firewalls were chosen for SaskWater. SonicWall firewalls offer the best value of Next Generation Firewalls. They offer comprehensive security with application intelligence and control as well as deep SSL packet inspection.

WBM utilizes SonicWalls Global Management System for centralized management, monitoring and reporting of all SonicWall products. In addition to this WBM is a SecureFirst Gold partner

BENEFITS TO SASKWATER

- Latest in Next Generation Firewall security
- Access to WBMs comprehensive reporting
- Able to leverage WBMs Gold partnership which includes all SonicWall capabilities (support, procurement etc)

Data Protection / Disaster Recover

In addition to the Next Generation Firewalls, WBM leverage several different technologies to ensure the new SaskWater environment had several levels of protection.

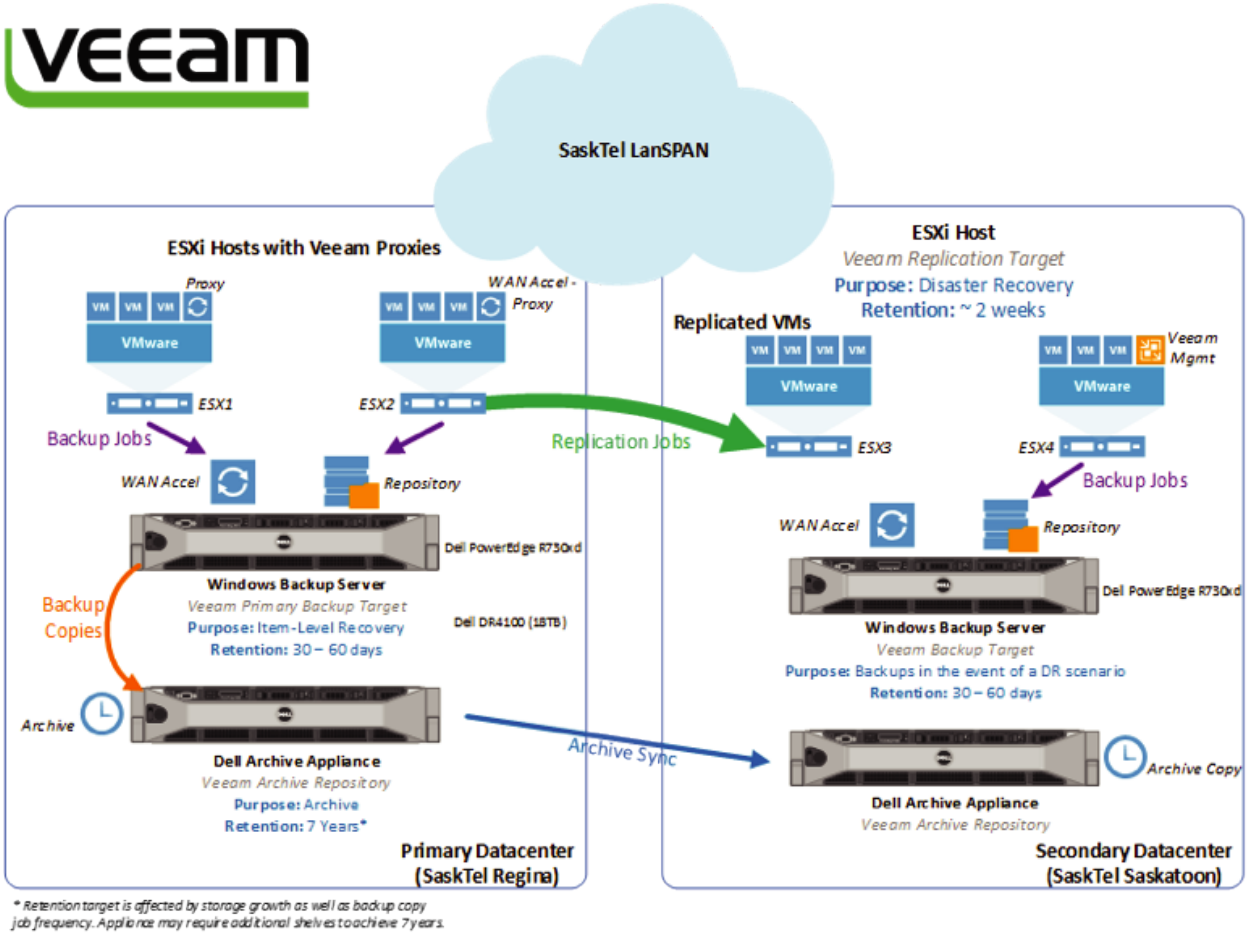
Backups

The Veeam Availability Suite was chosen for SaskWater. Veeam is an industry availability solution that offers the following benefits:

- Built for virtualization, agentless backup system that takes advantage of the virtualization snapshot technologies.
- Instant VM recovery
- Instant file-level recovery
- Instant application-item recovery (database rows or tables, individual email items etc)
- Built in source-side compression and deduplication
- Storage agnostic
- Replication, backup copies etc...

The design highlights of the backup infrastructure (shown below) are:

- Files are backed up locally to the Veeam repository, this is the short term, quick recovery backups
- Backup copy jobs move the backup jobs to a archival/deduplication appliance for long-term storage.
- The archival appliance replicates to the secondary data center for off-site storage of backups.
- Servers are replicated to the secondary data center for quick recovery



** Retention target is affected by storage growth as well as backup copy job frequency. Appliance may require additional shelves to achieve 7 years.*

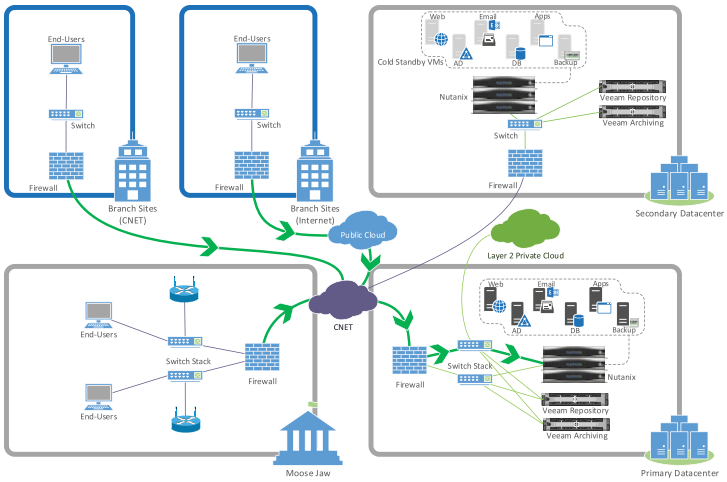
BENEFITS TO SASKWATER

- Stable backup and recovery
- Granular recovery of mail items, database items or AD objects
- Quick recovery of data from the local backup copy
- Long term storage of backups both off-site and on-site
- Ability to bring the data center online fast with the use of VM replicas

Redundancy / Failover

The environment was designed with redundancy in mind. The redundant infrastructure located in the secondary datacenter allows recovery from firewall/network failure to entire site failure.

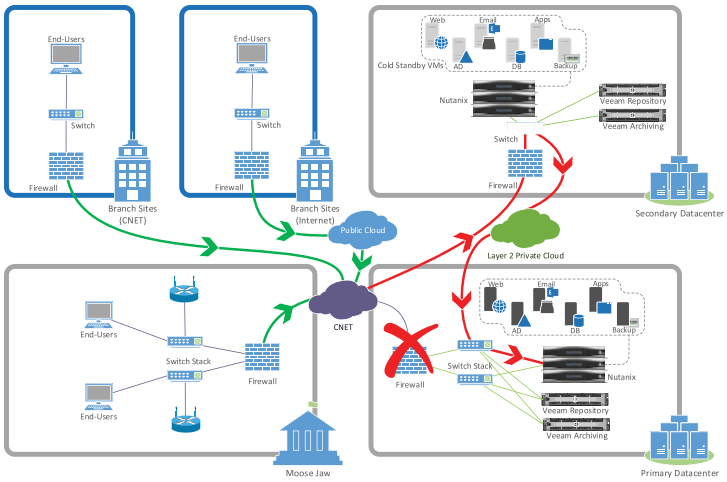
During normal operation, all production traffic will flow through the primary datacenter as shown.



Firewall Outage

In the event the circuit or firewall in the primary datacenter go down, the branch office VPNs, DNS records (DNS failover) will automatically failover to the secondary datacenter.

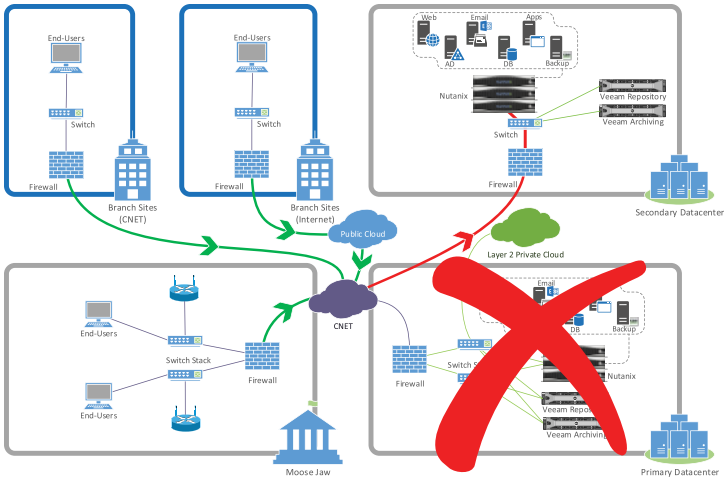
In the event of a failover, there is a very small delay as all the VPNs failover until the production servers are accessible again. In testing the delay was barely noticeable.



Site Outage

In the event of an entire outage in the primary datacenter the DR plan is invoked. The replica servers are brought online in the secondary datacenter.

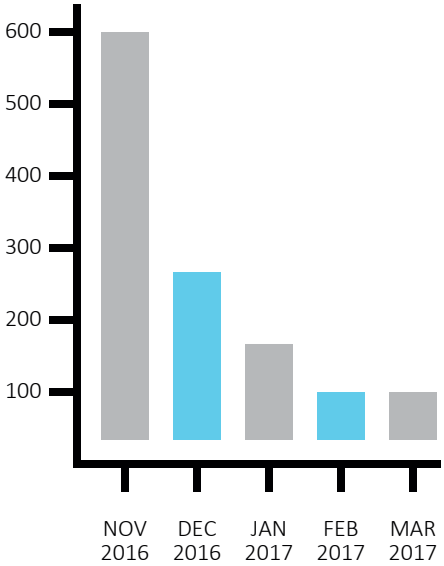
The RPO is 24 hrs and RTO 4 hours, WBM has tested and is able to bring the secondary datacenter online in less than 2 hours.



Managed Services

SaskWater was on-boarded just prior to the migration to their new infrastructure in November, in this way the Managed Services Pod had time to learn the environment prior to the migration. Initially the case load in the first week was heavy, mostly due to small migration related issues. Over the course of the next few months the call levels fell dramatically. Since January the Managed Services Team responsible for Saskwater has an NPS score of 95.

CASE COUNT REDUCTIONS



BENEFITS TO SASKWATER

- 24x7 support
- Able to leverage the knowledge base of WBM Managed Services

Quote

"WBM is a great partner for SaskWater. They really take the time to understand our business and work well with other partners that are involved including the application vendors, which we feel is important to the success of a long term engagement.

We knew that the infrastructure change that SaskWater required was quite complex and challenging with not only moving some of the infrastructure but also separating companies as we moved to a self-sufficient model. WBM's investment in quality resources that have the experience and expertise in the area of co-location and cloud solutions is exceptional. They designed a solution that is robust and the performance exceeds our requirements.

WBM has already performed a disaster recovery test to the requirements we set out and exceeded our expectations. We feel that what we have with WBM is a true vested partnership. When required they do not hesitate to come on site any time and that gives us peace of mind.

Overall our experience is very positive and we look forward to a long term partnership together with WBM."

PAUL MAYSON
Manager IT Services, SaskWater

SaskWater

End User Quotes

- *I thought it went way more smoothly than I would have expected.*
- *I honestly don't know if there is anything that could be done better. This project and all of it's delays and hiccups were handled near perfectly. Minor issues that arose after migration were dealt with in a timely fashion.*
- *I think the migration went as smooth as it possibly could have. Sure there were some issues, but there always are no matter what.*
- *Received good help desk support from WBM immediately after the transition.*
- *I believe, considering ALL the changes we were making at one time, there were minimum interruptions to our daily work. And what there were, SaskWater IT and WBM dealt with quickly. When you are used to a ticket sitting for weeks, this really went well.*
- *There was very little down time; could start the next day and basically pick up where I left off.*

Migration Survey Results

In total there were 50 respondents to the on-line survey regarding the IT Migration project

- Over **93%** of respondents were either **Satisfied** or **Very Satisfied** with how the IT Migration went
- **89%** felt the project went as or better than expected.
- Over **95%** felt the communication received about the project was clear
- When asked about their understanding of the project objective, tasks to be accomplished and role in the project, respondents, on average, rated all three questions at least 4 out of 5 with 5 being having a very clear understanding