

TotalVote Incident Report

Microsoft Azure Storage Outage

Date: 11/01/2024

Attention: South Dakota Secretary of State

Prepared by: KNOWiNK

Summary

On Friday, November 1, during the South Dakota absentee voting period of the General Election, County and State Officials reported TotalVote (TV) was inaccessible. Users were experiencing Error code 500's when trying to access the system. This error was investigated and discovered as a USGovTexas Region Storage Outage with Microsoft Azure. Included in the Microsoft incident response advisement an "inadvertent power event occurred. This impacted physical infrastructure which included the network devices in that cluster which degraded connectivity to the storage infrastructure."

As a result, South Dakota TotalVote was inaccessible to County and State Officials and the public Voter Information Portal (VIP) was inaccessible to voters.

Timeline

- 11:18 AM CST:
 - KNOWiNK (KI) was notified through TEAMS by SOS staff when the issue was reported and responded immediately to review the reported 500 error.
- 11:20 AM CST:
 - KNOWiNK confirmed server errors, and the database was unresponsive. KI restarted TotalVote App as an initial troubleshooting step and yielded no changes.
- 11:28 AM CST:
 - KNOWiNK and Azure Admin confirmed Microsoft Azure had an active issue with the USGovTexas Storage Accounts.
"We're sorry your SQL database is experiencing transient login failures. Currently, Azure shows the impacted time period for your SQL database resource at a two-minute granularity. The actual impact is likely less than a minute – average is 2s. If we are able to find the reason for unavailability, it will appear here within an hour after the downtime event. Please check back later to see if more information is provided."
- KNOWiNK continued to monitor and check for event updates through the submitted Microsoft (MS) ticket.
- 2:05 PM CST:

- KNOWiNK monitoring the app server and database saw the database come back up. KNOWiNK Staff tested user login to production passed and response time normal.
- 2:08 PM CST:
 - KNOWiNK notified SOS staff to login and test accessibility, and they confirmed the system was accessible and page/search response times were normal.
- 2:13 PM CST:
 - KNOWiNK advises SOS staff that counties can be notified the system is back up and running at this time, however, Microsoft Azure still had not formally notified us that this issue was resolved.
- 2:15 PM CST:
 - KNOWiNK communicated to SOS staff that KI would continue monitoring until MS formal notification is provided.
- 2:37 PM CST:
 - Microsoft has officially declared the issue mitigated.

Key Facts

Voter Impact:

1. **Voter Information Portal (VIP):** <https://vip.sdsos.gov/VIPLogin.aspx>
 This is a website where voters should be able to log in and see their registration details, track when their absentee ballots are sent and received by County Election officials and find out where to vote. This website uses the voter data from TV.
2. **TotalVote:** This is the election management system for County Election Officials. County Officials could not login to do basic tasks like search for voters to field calls or conduct important election tasks like the following:
 - Enter applications for voters requesting absentee ballots in person or by mail.
 - Print a label with voter's name and precinct information and Issue absentee ballots to voters in person or by mail.
 - Returned absentee ballots by mail or in person could not be entered in TV to track ballots received by County officials.

Root Cause

From Microsoft Service Issue Summary:

Between 12:11 EDT and 15:02 EDT on November 2024, a single storage scale unit became unavailable leading to customer impact in the USGov Texas Region. Customers using Virtual Machines (VM), databases and other Azure services may have seen timeout errors or their VMs being unavailable.

Since the incident was due to an outage in storage cluster any services hosted in or communicating with that cluster were also impacted including VMs, Cosmos DB, Azure

Kubernetes Services (AKS), SQL Database, Service Bus, Azure B2B Invitation Manager, Log Analytics, Application Insights and Microsoft Sentinel.

Inadvertent power event occurred. This impacted physical infrastructure which included the network devices in that cluster which degraded connectivity to the storage infrastructure.

Resolution and Recovery

- KNOWiNK escalated to the Elections (Democracy Forward) Team at Microsoft as a SevA case.

Microsoft Timeline:

12:11 EDT – Impact began

12:24 EDT – Teams were alerted and engaged once connectivity was disrupted to the storage infrastructure.

14:35 EDT – Infrastructure team confirms power event as primary cause

14:41 EDT – To mitigate, we reenergized restoring power to critical network devices

15:02 EDT – No further errors were observed, issue declared mitigated.

Corrective and Preventive Measures

- Applies to current legacy infrastructure as future infrastructure implements a system designed to handle business continuity and disaster recovery.
 - Create an active geo-replicated database from the Azure Texas region to the Azure Virginia region (implemented this weekend)
 - Internal Review of escalation and communication plan to leadership and Microsoft.
 - In the event of a full Disaster Recovery event, switch to the active geo-replicated replica (described above), modify code to point to new geo-replicated databases, deploy application services in Azure Virginia and resume operations.
- Provide the Secretary of State Statewide Voter Registration Lists daily, with absentee status, that could be distributed to each county in the event they do not have voter lists pulled.