American Council of Education

The American Council on Education (ACE) is a nonprofit membership organization that serves all types of U.S. accredited, degree-granting institutions: both two-year and four-year, public and private. They provide critical programs to enhance the capacity of colleges and universities in their efforts to serve students as well as programs to support nontraditional learning and promote adult access to postsecondary education. As institutions adjust to post-pandemic changes, ACE has recognized the need for more reliable web servers to support their members as they flex to accommodate many styles of learning nationwide.

CHALLENGE

To help better serve their members, ACE required a more stable, flexible and cost-effective solution for hosting web servers to better handle expected spikes in CPU usage, reduce false positives in alerts and avoid alarm fatigue for the operations staff.

Red River recommended implementing AWS with advanced cloud monitoring capabilities to:

1. Reduce their reliance on physical infrastructure and improve stability

2. Improve availability

3. Reduce web hosting fees by moving to an OpEx from a CapEx model

4. Proactively monitor and detect issues

SOLUTION

To assist ACE with enhancing their web servers, Red River implemented machine learning models using AWS CloudWatch anomaly detection to generate alerts across a broad range of metrics including datapoints, thresholds, infrastructure and application layers (see Fig. 1).

By implementing Cloud Watch to ingest the logs from AWS and send alerts through Logic Monitor (outside of the OS, ACE can see any potential deficiencies right away so they can reallocate resources for optimal performance.

Datasource	Datapoints (metrics)	Alert Threshold
HostStatus	idleInterval	Static :> 300 300 300
Ping	recvdpkts	Static :<= 2 2 2
SSLCerts	Expires_In_Days	Static :<= 30 14 7
WinCPU	CPUBusyPercent	Static :>= 98 98
WinOS	MemoryUtilizationPercent	Static := 100 100
WinOS	PercentVirtualMemoryInUse	Static :> 95 95
WinServer	BlockingRequestsRejected	Static :!= 0
WinServer	ErrorsLogon	Static :>= 1
WinServer	ErrorsSystem	Static :!= 0
WinServer	PoolNonPagedFailures	Static :!= 0
WinServer	PoolPagedFailures	Static :!= 0
WinServer	WorkItemShortages	Static :!= 0
WinVolumeUsage	PercentUsed	Static := 90 95 99

Figure 1

Reduced Time to Remediation

To help ACE improve their limited monitoring capabilities and reduce time to remediation, Red River implemented standardized alerting through a customizable dashboard of advanced statistics that provides improved cloud logic monitoring (see Fig. 2). This solution reduces time to remediation and auditing capabilities by allowing Red River to monitor any changes to code at a granular level to diagnose and prevent issues quickly.
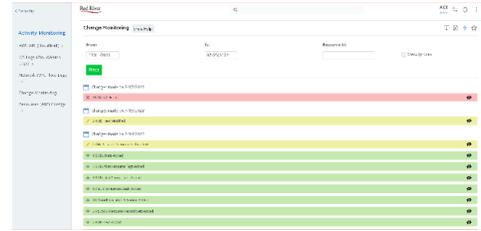

Figure 2

Improved Visibility with AWS CloudWatch

Every 24 hours, AWS CloudWatch runs an audit, checking across five categories – Security, Cost, Availability, Usage, AWS Trusted Advisor – and issues a report (see Fig. 3). Tickets are created as a result of automated alerts, giving ACE more visibility into how their AWS environment is functioning. This solution creates complete transparency, and the ability to monitor any changes at any level.
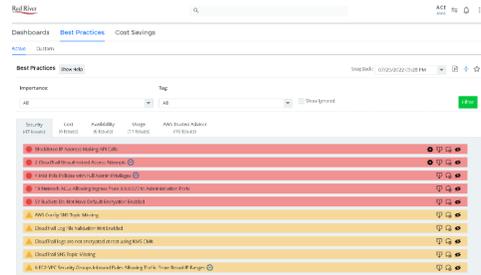

Figure 3

Automated Alerts & Integrated Ticketing System

Red River set thresholds to receive specific alerts to continuously monitor the health and stability of the environment. (see Fig. 4).
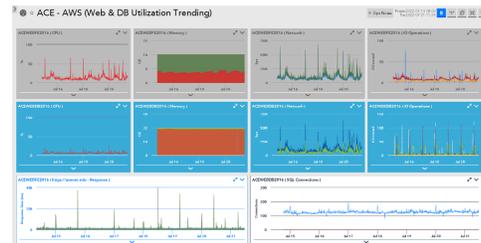
With customized alerting thresholds (see Fig. 5) users receive notifications about capacity, performance and availability in order to prevent downtime and promote the efficient use of resources. Figure 6 is an example of the RedConnect Portal which is the view into the ticketing system, allowing customers to access all open cases.

Figure 4

Figure 5

Total Compliance with AWS CloudCheckr/CIS Benchmark

Red River provided ACE with an effective strategy around renewing warranties and outdated services by utilizing AWS CloudCheckr, identifying best practices for their AWS environment and remain compliant (i.e., SOC-2, NIST). CloudCheckr proactively creates alerts on any security issues through a customizable dashboard (see Fig. 7) with benchmark control metrics supported by the Center for Internet Security (CIS). The data present in the CIS Benchmark module provides ACE with up-to-date information to facilitate real-time decision-making.
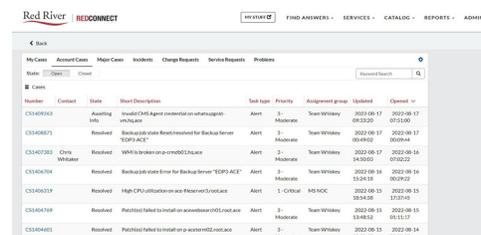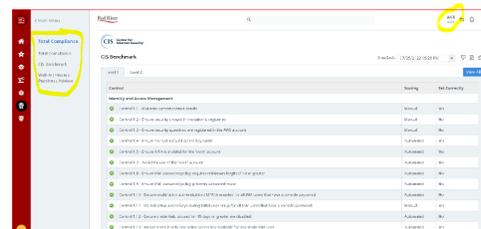

Figure 6

Figure 7

RESULTS

The new solution added proactivity and visibility into ACE's AWS environment, giving them the flexibility needed to identify and address anomalies in CPU behavior or security. In transitioning to OpEx from CapEx, Red River helped ACE lower ongoing costs related to day-to-day operations of web hosting, allowing them to pay for the resources they need as they need them.

ACE saw many immediate benefits by improving their AWS infrastructure, including:

• A rapidly scalable infrastructure with complete visibility

• Alerting that automatically detects anomalies and abnormal changes

• Customizable dashboards and statistics to gain insights for issues management

• Standardized thresholds for monitoring to establish a robust process for management

Ultimately after implementing AWS, ACE has benefited from next generation monitoring capabilities including advanced levels of visibility into the OS layer to ensure smooth and seamless operations regardless of the security challenges or bandwidth needs they may face.