Smart Software Algorithms Let IT See the Future

Patented CloudIQ algorithms apply human and machine intelligence to help IT teams move faster and be more successful.

Part 3 in a series of blogs.

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With so many infrastructure elements supporting so many important applications, you need a way to clearly see all your systems' capacity and where it's headed.

AIOps is the answer.

In my previous blogs, I discussed how AIOps software lets you breathe easier (with intelligent health scoring and recommendations for remediation) and lets you see your infrastructure more clearly (with performance anomaly detection and impact analysis).

In this blog, I will discuss AIOps' forecasting intelligence and will focus on storage capacity use cases.

Seeing the Future with Capacity Prediction

Business Challenge

Think of a mission-critical application that has become inoperative because storage reached full capacity. To avoid this, you need to be aware of when a system will reach capacity by learning usage history and patterns, predicting what is likely to happen in the future and to know how and when to act before you run out of capacity.

Technical Solution – Capacity Prediction

Let's start with storage arrays. CloudIQ displays a summary of the data storage objects, such as LUNs, pools, volumes, file systems and more, approaching full capacity, an estimated time range remaining until each file system or pool is full and shows a forecast capacity chart. If full capacity is imminent, such as a file system or pool running out of space within 24 hours,

CloudIQ displays the estimated time and a list of top five contributors. This allows you to make quick decisions about moving workloads to other storage systems, reclaim unused capacity or other action.

Three main factors that distinguish CloudIQ capacity prediction are:

1. Response time of capacity prediction is 10X faster in CloudIQ compared to other solutions.[1] Overall, the method and process are patented to achieve such a response time. Algorithms scale the time series data in a unique way to use multiprocessing and multi-threading operations.
2. Capacity prediction in CloudIQ considers multi-level storage objects while forecasting for the parent storage object. This significantly increases the quality of capacity predictions. Intelligent algorithms look at both higher-level as well as lower-level storage objects and aggregate the capacity forecast to achieve trustworthy predictions.
3. The footprint of capacity prediction in CloudIQ is much larger compared to others. The scale of capacity prediction is enormous in CloudIQ. The prediction window enables both strategic, long-term capacity planning, up to a year, as well as urgent, short-term capacity planning, within 24 hours.

To help resolve these issues, CloudIQ gives you a single dashboard to see capacity of all your storage systems enterprise-wide (so you know where to move workloads where there is available capacity) and to see reclaimable storage (block and file objects that may no longer be in use so you can re-purpose it).

Beyond Storage Arrays – Capacity Prediction for Other Types of Systems

Today, CloudIQ also monitors and predicts full capacity for hyperconverged infrastructure systems. Capacity full protection for servers (CPU and memory), IP and SAN switches (ports) and data protection for back-up on premises and tiered in public clouds, are on the horizon for full infrastructure. Another recent innovation is Optical Failure Prediction for storage area networks, intellectual property that we can leverage for other types of failure prediction software development.

What Users Say About CloudIQ's Impact

We regularly poll our customers, and here are some representative comments.

"CloudIQ helps us solve problems two times faster than before." – *Data Center Analyst, IT Services and Cloud Provider*

"I'm using CloudIQ and find it a very helpful tool for analytics and pro-active alerts to prevent any utilization issues or any outages due to utilization." – *Consultant, Telco*

Seeing the Future

Having a way to see what will happen if you're not proactive is essential. So you know how and when to act. AIOps can be a game-changer for your whole business. Surveys show that CloudIQ enables IT teams to resolve infrastructure issues 2X to 10X faster[1] and saves them one workday per week on average.[1]

Stephen Elliott, Group Vice President at the IDC analyst group, explains that AIOps is "a new kind of application that applies knowledge and automation for optimizing performance and availability of infrastructure and application is essential."

For a brief overview of AIOPs from IDC's Stephen Elliott, see this short video.

You can also watch a variety of short AIOps demo videos, an IDC white paper on AIOps and my related blogs on www.dell.com/cloudiq.

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Deepak Nagarajegowda is an accomplished engineering leader with a history of developing and deploying innovative IT solutions in Supply Chain, Data Center, Data Science, Analytics and Data Engineering domains. As Senior Principal Data Scientist for the Infrastructure Solutions Group at Dell Technologies, Deepak is playing a leading role in developing CloudIQ AIOps for the company's infrastructure product portfolio. Deepak holds eleven US-granted patents in AI/ML, Cyber Security and Data Storage, with more than 26 patents pending. Before Dell, Deepak worked for Verizon, Cisco, Intel and Sony in Supply Chain, SAP, Big data, Cloud computing, Distributed Computing, and AI/ML.

[1] Principled Technologies Lab Report: Dell EMC CloudIQ streamlined the user experience in five cloud-based storage preventative management tasks. June 2020.

[2] Based on a Dell Technologies survey of CloudIQ users conducted May through June 2021