



7 Ways to Unlock the “Big” in Your Big Data

Quantum[®]

Industry Perspective

Introduction

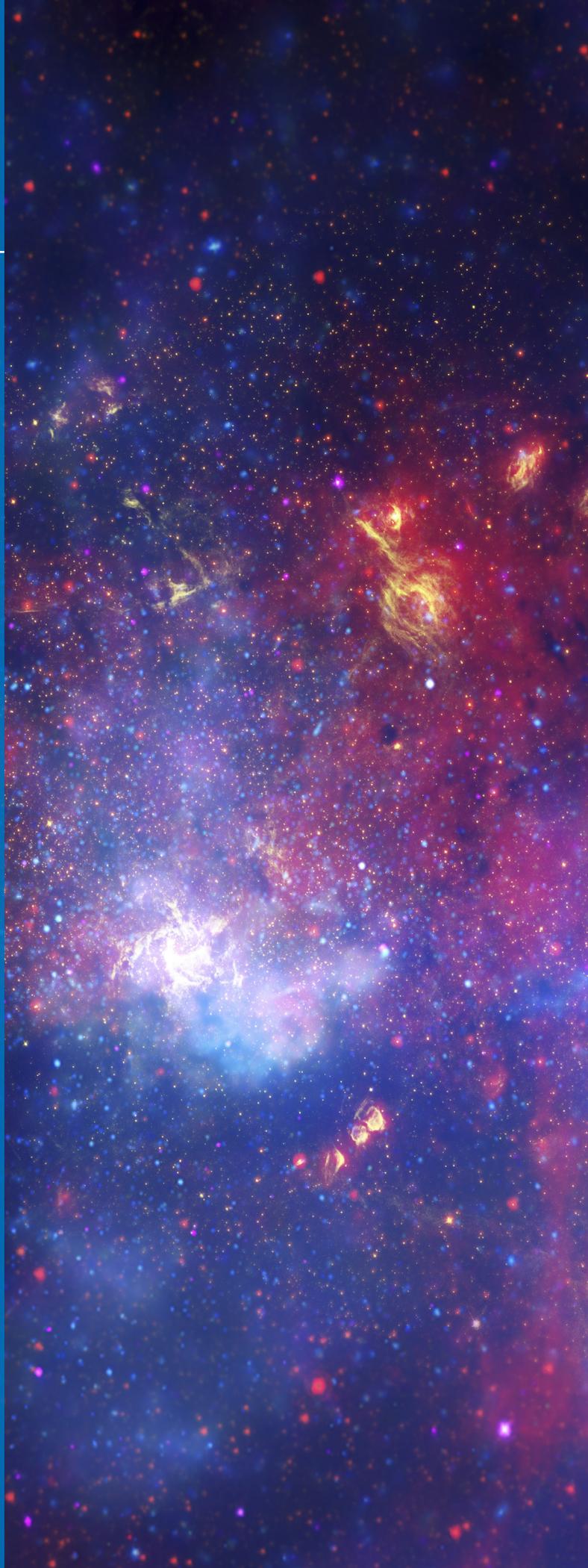
It's no secret that the amount of data in the world is growing. One study predicts there will be up to 44 zettabytes of data by the end of this decade alone. That's nearly as many data points as there are stars in the sky. So how does government get a handle on this ever-growing data?

For many resource-constrained government agencies, a storage strategy to manage that expansive information needs to be put in place before the data management challenge detracts from the mission at hand.

To help the public sector better understand how to extract value from big data, GovLoop partnered with Quantum, a leading expert in scale-out storage, archive and data protection. This industry perspective takes a look at the rapidly growing use of big data, as well as storage strategies that can help government agencies better manage data as they capitalize on newfound insights.

GovLoop spoke with Claire Giordano, Senior Director of Emerging Storage Markets at Quantum, who explained the rise in big data and what government organizations can do to stay focused on the value offered by this wealth of information.

Multi-tier storage — a solution where data can be stored on different types or “tiers” of storage based on the needs of the application and the workflow — is an approach being used more and more in big data environments. The flexibility to automate the movement of data between types of storage such as flash, high-performance disk, object storage, tape archives and cloud can be a key enabler to unlocking the value in big data, Giordano said.





The Astronomical Growth of Data

Before diving into how to manage big data, it's important to understand why so much data is being amassed in the first place — because the drivers of growth also determine how it can be tackled.

The exponential increase in the amount of data being created has many organizations struggling to keep up. However, Giordano sees a difference in big data and big data analytics: “Beyond the analytical challenges, I'm talking about solving the complex data management challenges that come with big scale.”

Several factors are contributing to the increase in big data:

- ▲ **Raw data growth.** The evolving sophistication of technology is simply creating more data than ever before. Cameras and sensors can be placed on almost anything today, from drones to buildings to satellites, creating a wealth of data to power mission-critical decision making.
- ▲ **Advanced analytics capabilities.** Once that initial data is captured, advanced analytics technology lets scientists and government users do more with it. However, the software analysis creates new, unique datasets that also require processing and storage.
- ▲ **Increased retention.** Because technology advancements have created new ways to repurpose data, more data is being preserved for potential future use even when it is not considered valuable today. “Many government agencies have very long retention periods – scientific research, intelligence and military use cases for example. In fact, when you ask life sciences researchers what the retention timeline is for their data, they will say that it's indefinite,” Giordano said.

Additionally, legislative mandates and compliance regulations require more agencies to maintain detailed archives of their past operations and data. “Organizations are simply retaining data longer,” Giordano said.

7 Ways to Unlock the “Big” in Your Big Data

What is the “big” in big data? According to Giordano, “It’s the insights that organizations derive from the data — insights that can influence national security, defense, science, healthcare and our planet.”

The right storage infrastructure can transform the way agencies capture, share, analyze and preserve data. “Data is obviously important, but what matters most is deriving value from that data and turning the raw data into actionable information,” Giordano said.

She offered seven ways to use end-to-end, multi-tier storage to unlock the value in big data.

1. Enable shared access.

“All government users need access to their data, right? That’s what they care about,” Giordano said. “They care about getting access to the data when, where and how they need it. And not just for today’s project, today’s research or today’s workflows — they need to make sure they will have access to this data in the future.” That means agencies must deploy intelligent data management solutions that ensure that their users have long-term access to the data they need with the performance they need, even at massive scale.

Collaboration is crucial to organizational goals. “More and more, teams are collaborating across departmental and agency boundaries,” she continued. “In projects today, people might be in different locations across the country, but they need to share data. Specialized storage that provides shared access to data will help these organizations get the job done.”

2. Make flexible integration a priority.

When people are working in different environments, the solutions they share must be built to operate in different IT environments, too. Flexibility is key if an agency wants to accommodate a wide range of users, computing architectures and infrastructures. Quantum’s multi-tier storage can integrate across a government network, even when different departments or offices leverage different platforms and applications.

Users can quickly and seamlessly share files over internet protocols; work with partners who run Linux, Windows, UNIX or Mac OS; and integrate different types of storage like spinning disk or object storage into a single namespace. While data is moved to the optimal storage tier behind the scenes, users access their data in the same familiar way regardless of file location.

“Think about a scientific research organization. There are large teams of researchers all sharing data within the same organization,” Giordano said. “Some of them are accessing it over really slow Internet connections, other people have faster connections — 10GbE or Fibre Channel, for example. And each team might have its own operating environment or applications it depends on to get work done.”

3. Embrace the need for speed.

“Your analysts, your researchers and your creatives need access to all of that information, as does your application,” Giordano said. “And sometimes it needs to be high-speed.” As teams become more distributed, they need consistent, reliable performance for work to be accomplished effectively in each location.

Data must be captured in real-time and made quickly and easily accessible. What’s more, that accessibility can’t deteriorate as your data load inevitably grows. “Your storage should be able to deliver not just the performance you need today, but also performance you’ll need later this year and next year as your data grows and the demands of your software applications increase,” Giordano said.

“[At Quantum], we strongly encourage our customers to design storage infrastructure for the performance they need today as well as the performance they’re going to need tomorrow,” she continued. Quantum delivers leading streaming performance that meets the most extreme requirements for data ingest and access, giving agencies the performance they need to support workloads as they continue to evolve over time.

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-Claire Giordano, Senior Director of Emerging Storage Markets, Quantum

4. Prepare to scale.

As data demands grow, some agencies might find that data must be migrated to an upgraded platform, which can take applications offline. The process is both time-consuming and labor-intensive. By prioritizing scalable storage, agency leaders can adopt a storage strategy that grows along with data needs without interrupting users. Quantum storage is designed to enable collaboration on large files and large sets of large files, scaling easily to support many petabytes of data.

By incorporating a variety of storage tiers like object storage and tape, agencies gain cost-effective options to preserve vast amounts of data well into the future. Quantum's dense object storage can store petabytes of data in a single rack, providing high-performance access even in large-scale deployments. What's more, as additional capacity is needed, Quantum's flexible durability policies enable configuration changes to add more storage or even to expand from single-site to multi-site configurations without disruptive data migration. Data will automatically be re-spread, as a background process, to accommodate the new configuration.

That scalability allows agencies to focus on their workflows rather than the technology that powers them.

5. Leverage the economics of tiering.

Multi-tier storage helps organizations manage the growth of data without taxing already constrained, public sector budgets. "You want to be able to scale and store all the data you need, but you also want to be smart about it and choose cost-effective solutions that allow you to match the type and cost of storage to the performance and access needs of the data," Giordano said. "Big data doesn't have to mean big spending."

With a dynamic multi-tier storage solution, government agencies can put different types of data on different types of storage to better manage cost and avoid forced data migrations. High-speed storage can be reserved for the most critical applications, without having to invest in expensive storage for data that doesn't need high-speed access.

6. Don't forget the archive.

Additionally, multi-tier storage lets agencies build a durable, scalable self-service archive. Giordano said this archive is critical: "When it comes to national security, you can imagine that when there's an incident, you have to be able to dig through your video or information archive quickly and effectively to find information, track people down and understand what else might be planned."

Every agency can imagine a scenario in which high-speed, reliable access to archived data could make or break a critical mission function. The flexibility of multi-tier storage to leverage archive tiers like cloud or tape across networks and scale as needed provides agencies with a long-term solution that can last the lifetime of their data — while still keeping data available and ready for use.

7. Remember: it's all about the workflow.

Ultimately, Giordano said the storage infrastructure should be chosen to enable an organization's workflows — to enable government teams to derive value from their data at every point along the way. That's why Quantum deploys a flexible storage solution. "We design our storage to be able to integrate it easily into whatever a customer's workflow is," Giordano explained.

"Even though we are in the storage business, and even though the infrastructure that Quantum provides is critical to our customers' ability to unlock the value in their data, it's not the first priority for our customers," she continued. "They care about the workflow and the job they're trying to do — which is why our focus is on enabling their workflows with the right storage technology at the right time."

Unlocking Value in Data with Multi-Tier Storage

The growth of data being captured and collected today — and the increased sophistication of the tools that can be used to exploit this data — presents both an opportunity and a challenge for government organizations. While this wealth of information will undoubtedly lead to increased situational awareness, new scientific discoveries and more effective decision-making, the influx of information also forces agencies to find new data management solutions that can handle today's big data challenges.

Quantum's multi-tier storage solutions, including object storage and cloud, can be a key enabler in meeting today's challenging data management requirements. Quantum provides storage infrastructure with the performance, access and scalability that organizations need to unlock the value of their big data — to unlock the "big" in their big data.

Different Use Cases for Big Data in Government

Government organizations are creating and collecting massive amounts of data, but to what end? How are agencies using that information to accomplish mission objectives? Giordano outlined several use cases for big data in the public sector.



GEOSPATIAL INTELLIGENCE AND SURVEILLANCE

With advancements in sensors, cameras and precision geo-location technology — not to mention small satellites and drones — geospatial data is growing. Satellite and motion imagery technologies provide valuable data about space, the environment and weather — as well as data that are critical to intelligence and defense agencies.



LIFE SCIENCES

The life sciences field is changing rapidly, due to declining cost and run times in genomic sequencing, better analysis tools and more affordable medical imaging technology. As these advancements enable researchers and clinicians to advance science at an ever faster rate, agencies need storage that allows them to preserve data for decades.



VIDEO SURVEILLANCE

Today's low-cost, high-definition cameras make it easy to capture high-quality video surveillance — and advances in analytics are making the surveillance footage more useful. Combine these technology advances with new policies that require the recording of certain events, and the result is a massive increase in the amount of video surveillance that needs to be captured and preserved.



SCIENTIFIC RESEARCH

Scientific research depends on both analysis and collaboration to find patterns, derive insights and draw connections. One important key to success is storage that balances the performance needed for computational analysis with cost-effective retention to keep data available for long-term study.



GOVERNMENT VIDEO

Today, more and more agencies use video to train employees, communicate across departments and promote their message to citizens. While it's easier than ever to create engaging video content, the volume of video content presents new challenges. Higher resolution, more frames per second, an increased number of cameras and greater retention capabilities mean a much larger challenge as agencies manage video.



ARCHIVES

More and more, agencies recognize the long-term value of their data—and that sometimes the data might be even more valuable in the future, when it can be connected to a future event or repurposed in an unexpected way. Scalable, cost-effective big data archives that protect information for the long-term are a critical part of the data management strategies employed by agencies today.



CYBERSECURITY

With the increase in cybersecurity threats, organizations realize it's a question of when — not if — they will be attacked. When breached, agencies need to investigate and quickly resolve the attack.

Quantum focuses on a domain of cybersecurity called network forensics that allows agencies to examine detailed network traffic data to determine exactly what was stolen and when. With network forensics, security teams can look back in time to figure out what happened.

About Quantum

Quantum is a leading expert in scale-out storage, archive and data protection, providing solutions for sharing, preserving and accessing digital assets over the entire data lifecycle. From small businesses to major enterprises, more than 100,000 customers have trusted Quantum to address their most demanding data workflow challenges. With Quantum, customers can be certain they have the end-to-end storage foundation to maximize the value of their data by making it accessible whenever and wherever needed, retaining it indefinitely and reducing total cost and complexity. See how at www.quantum.com/customerstories.

For more information about Quantum storage solutions, visit:

www.quantum.com

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About GovLoop

GovLoop's mission is to "connect government to improve government." We aim to inspire public-sector professionals by serving as the knowledge network for government. GovLoop connects more than 200,000 members, fostering cross-government collaboration, solving common problems and advancing government careers. GovLoop is headquartered in Washington, D.C., with a team of dedicated professionals who share a commitment to connect and improve government.

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