



SIX REASONS TO MIGRATE FROM TERADATA TO SNOWFLAKE

The path to becoming a cloud-based, data-driven federal agency



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CHOOSING A CLOUD SMART DATA PLATFORM

In accordance with Executive Order 13800, the U.S. Office of Management and Budget (OMB) recently updated the Government's legacy Federal Cloud Computing Strategy ("Cloud First"), replacing it with a new strategy to accelerate agency adoption of cloud-based solutions: Cloud Smart.¹

As part of the Cloud Smart strategy, U.S. Federal Chief Information Officer, Suzette Kent, advises that "cloud adoption strategies that successfully meet the intent of Cloud Smart should not be developed around the question of who owns which resources or what anticipated cost savings exist. Instead, agencies should assess their requirements and seek the environments and solutions, cloud or otherwise, that best enable them to achieve their mission goals while being good stewards of taxpayer resources."

The first question that every government agency should be asking itself is this: "Does our current data warehousing solution use the best technology to enable us to achieve our mission goals while being good stewards of taxpayer resources?" Any agency

that cannot answer that question with an unqualified "yes" should seriously reconsider replacing its current data warehousing solution with a data platform built for the cloud. This is especially true if your agency is still relying on a traditional on-premises data warehouse designed for the 1970s.

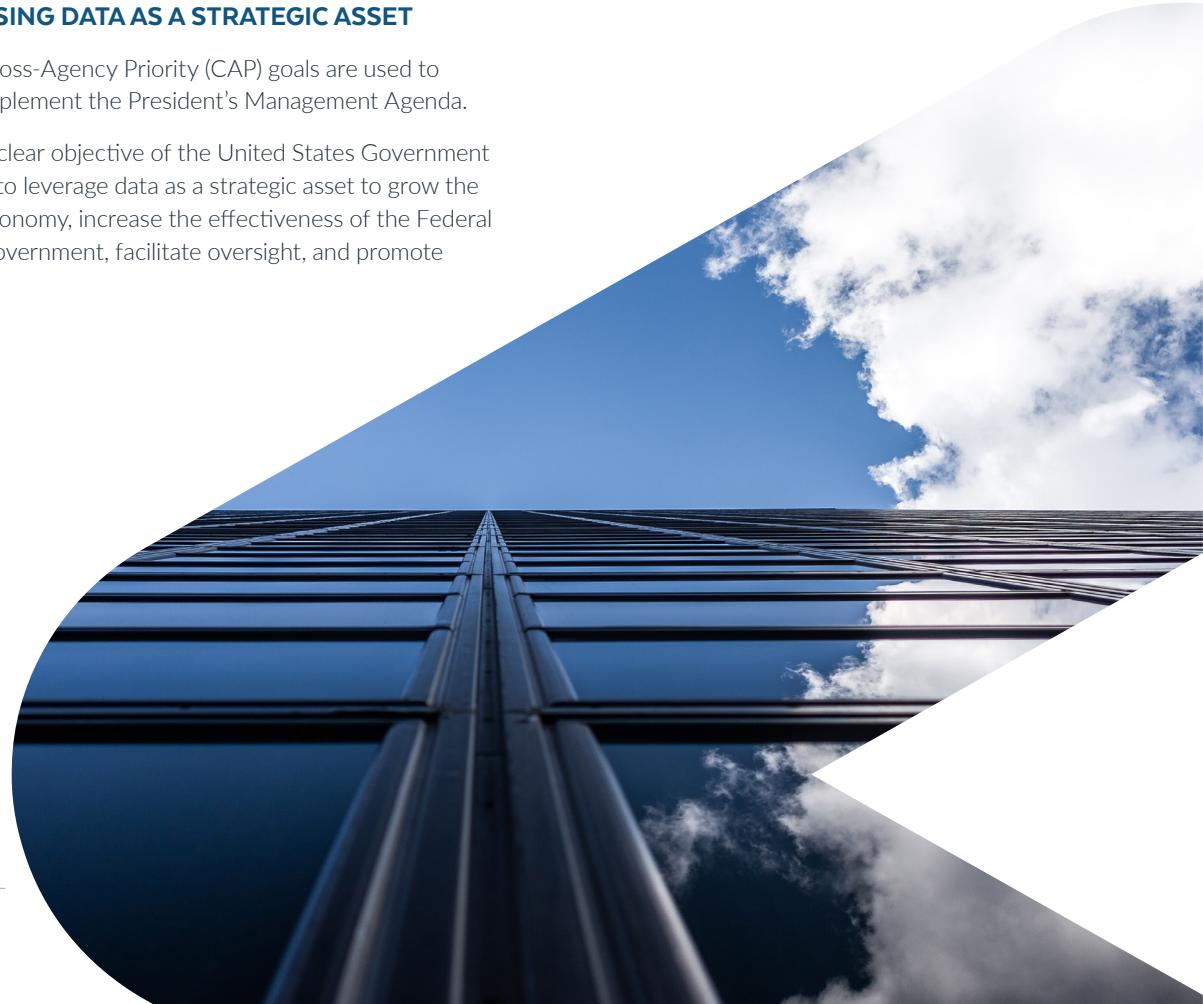
USING DATA AS A STRATEGIC ASSET

Cross-Agency Priority (CAP) goals are used to implement the President's Management Agenda.

A clear objective of the United States Government is to leverage data as a strategic asset to grow the economy, increase the effectiveness of the Federal Government, facilitate oversight, and promote

transparency. The Federal Government needs a robust, integrated approach to using data to deliver on mission, serve customers, and steward resources while respecting privacy and confidentiality. Choosing the right data platform built for the cloud is critical to achieving an agency's Cloud Smart objectives."

¹ <https://www.whitehouse.gov/wp-content/uploads/2019/06/Cloud-Strategy.pdf>



SHOULD YOUR AGENCY RELY ON TECHNOLOGY FROM 1979?

Undoubtedly, there is a Teradata data warehouse appliance in your data center. Maybe even more than one. But other than approving its purchase, you may not know much about these \$10 million solutions, or exactly why your agency has one or more of them.

TERADATA: BUILT FOR 1979

In 1979, Teradata's founders "design[ed] a revolutionary database management system for parallel processing with multiple microprocessors, specifically for decision support. The microprocessors, like horses, were harnessed to pull a large load rather than relying on one horse to do all the work."¹ Today, the company's data warehouse solutions are largely built on the same template from 1979: a computing

box equipped with multiple microprocessors and lots of disk storage, with a layer of data warehouse software on top.

Using this formula, the company has preached for decades an attractive message to IT organizations and executives: A Teradata solution is the only option for safely storing enormous amounts of government data such that this data serves as a "single source of truth"² for many thousands of users to access concurrently.

For 40 years, Teradata's message was accepted as exactly that: the only way to maintain consistent, accurate, and secure government-wide data.

SNOWFLAKE: ARCHITECTED FOR THE FUTURE

Founded in 2012, Snowflake is changing the very essence of how people use data. We designed not an expensive solution in a government data center.



¹ "The History of Teradata," <http://www.teradata.com/about-us/history>

² A concept that an organization can apply as part of its information architecture to ensure that everyone in the organization uses the same data when making business decisions. <http://whatis.techtarget.com/definition/single-source-of-truth-SSOT>



Because our cloud data platform was architected using modern technologies, Snowflake users benefit in ways unimaginable to Teradata users:

- No limits on the amount of varying data types stored or the number of users who can access it concurrently without impacting performance.
- Data security measures that far exceed the standards implemented in government data centers.
- Variable operating expenses. No need for a multi-million dollar capital expense to purchase Teradata, or the millions to upgrade and maintain an existing Teradata solution. With Snowflake, your agency pays for only for the compute and storage it uses and never has to upgrade.

Snowflake is on a mission to safely and efficiently store, transform, and analyze government data, so any user (government employee or citizen) can easily and quickly gain data-driven insights. Our many corporate customers, including CapitalOne, Nike, Nielsen, Adobe, Sony, and Electronic Arts, attest to the game-changing value proposition we deliver.

Read on to learn how Snowflake can give your agency what it needs right now to quickly become Cloud Smart and start reaping the rewards of a data platform built for the 21st century:

1. A single source of truth
2. Dramatically lower IT costs
3. Data security superior to on-premises protection
4. Instant and disruption-free scalability
5. A platform for advanced analytics: Artificial intelligence (AI) and Machine learning (ML) are just the beginning.



**Snowflake
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REASON #1: SNOWFLAKE GIVES YOU A SINGLE SOURCE OF TRUTH

A single source of truth is a simple concept. It's the definitive, reliable data repository that contains every iota of data necessary to answer crucial questions. But 40 years after Teradata's birth, achieving a single source of truth still eludes most government agencies.

In the past, a Teradata data warehouse gave agencies a reasonable means of storing the entirety of their data and delivering acceptable performance. However, in just a few years, the quantity and types of data that government agencies collect, store, and process has skyrocketed, as has the number of users who want to access and analyze it.

As a result, most agencies' attempts to achieve a single source of truth have resulted in a fragmented data landscape characterized by a multitude of data repositories, including data marts, representing dozens or hundreds of data silos. This problem exists for Teradata in at least two ways:

- The system is a compilation of data silos inside the Teradata solution.

OR:

- Your organization has exceeded the capacity of your Teradata solution, forcing agencies to create their own data silos, in the form of data marts, to execute their own analytics.

Why should a single source of truth matter? For several reasons, including the following:

- To analyze all relevant data, you first need to integrate data from all data repositories, which is time-consuming and requires specialized skills.
- Storing data in different locations increases the chances of having conflicting data; for example, if data is updated in one data repository and not in the other.
- Storing duplicate data is unnecessarily costly.
- Maintaining different data repositories increases security risks and makes compliance more challenging.

SNOWFLAKE DELIVERS A FOUNDATION OF DATA TRUTH

With Snowflake, agencies can store all of their data, of any size, in a single cloud data platform. Once it is there, any number of users can query the data at the same time, without performance degradation.

Snowflake offers numerous choices to increase or decrease computing power and data storage, independent from one another, instantly or on demand, and all in the cloud.

Finally, your agency will have a single data source at which to point all government processes for consistently accurate results.

A single source of truth is the foundation upon which all other Snowflake benefits are built.



REASON #2: SNOWFLAKE CAN SLASH YOUR DATA PLATFORM COSTS

Your Teradata solution costs far more than its \$10 million price tag. After you buy and install the solution, it requires:

- Data center space and network connectivity
- Software licenses, maintenance and support
- Data security
- Hardware maintenance and upgrades
- People to administer and maintain the data warehouse and the hardware

All of these factors significantly increase the total cost of ownership (TCO) of any on-premises or “cloud-washed” data warehouse.

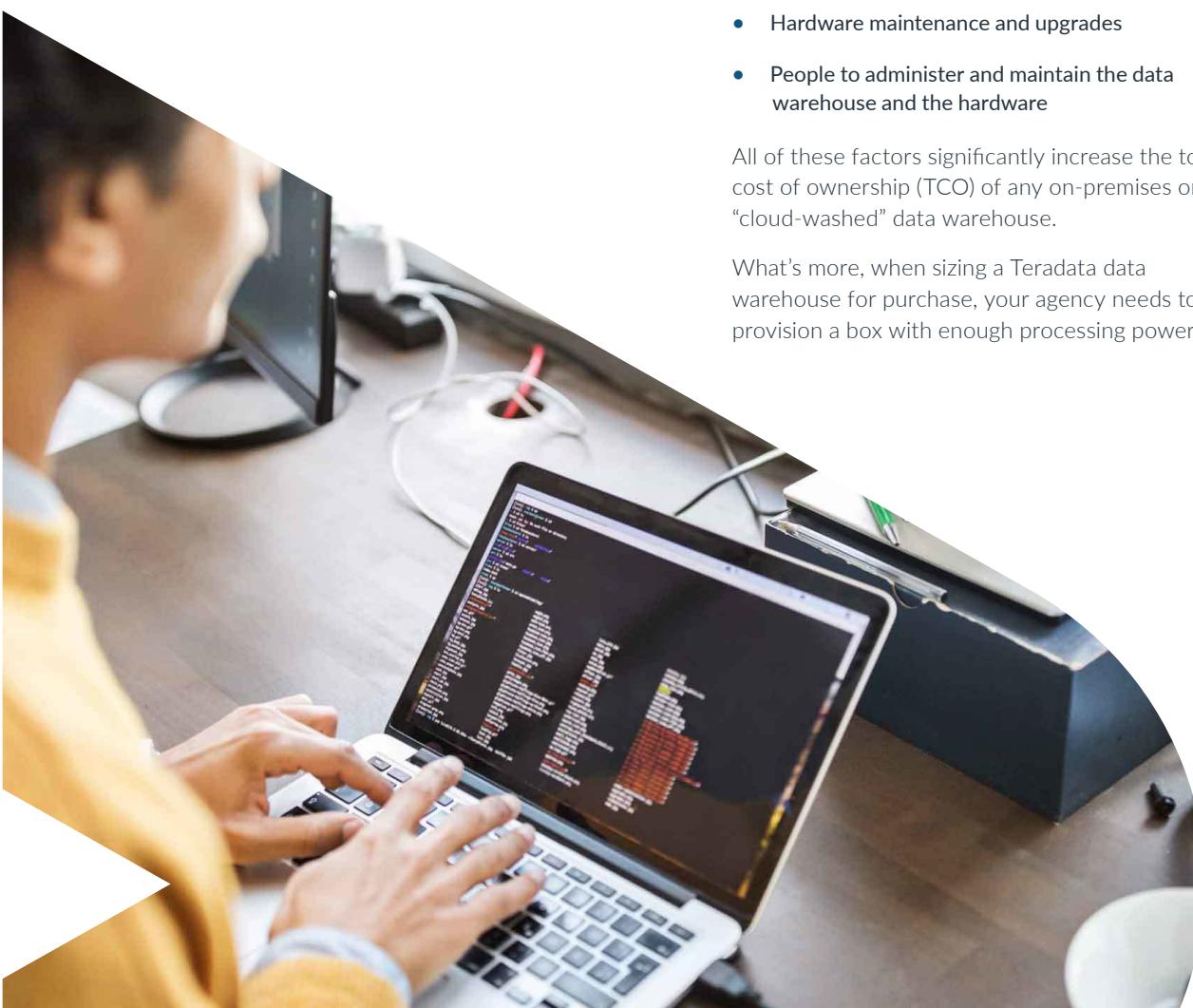
What's more, when sizing a Teradata data warehouse for purchase, your agency needs to provision a box with enough processing power

and storage to handle the busiest day of the year. On less-busy days, which are most days, the underutilized system will sit idle, silently incurring costs. Eventually, you will exceed the power of your Teradata solution that you once underutilized and will be forced to queue workloads and create data marts in order to preserve performance.

PAY ONLY FOR THE RESOURCES YOU USE

Snowflake gives you a new way to think about buying data platform resources. Instead of laying out \$10 million up front and recurring, annual costs, you'll pay only for our cloud computing resources on a per-second consumption basis. Specifically, your agency can capitalize on Snowflake's instant elasticity — accessing any level of computing horsepower and paying only for what it needs.

Snowflake's Cloud Data Platform can support an unlimited number of users accessing your agency's single source of truth, all at the same time. Unlimited cloud resources adjust dynamically or on-demand, without lag time. In this way, you'll avoid buying more data management power than is needed for the other 364 days of the year.



REASON #3: SNOWFLAKE'S SECURITY MEASURES ARE STRONGER THAN YOURS

Data breaches are today's number-one threat to government data, placing citizens' personal data and the nation's security at risk. When breaches occur, the government loses money, citizens lose trust, and administrators lose their jobs.

In terms of both frequency and severity, the threat posed by data breaches is climbing. According to a report published by Comparitech in July, 2019,³ "The US government suffered 443 data breaches since 2014, with 2018 being the worst year so far." Here are the study's key findings:

- Since 2014 there have been 443 government/military data breaches involving 168,962,628 records.
- 2014 accounted for 90 data breaches involving 9,419,799 records.
- In 2018, there were a total of 100 data breaches involving 81,505,426 records.
- The most breached departments were the Department of Health, the Department of Veterans Affairs, and city networks.

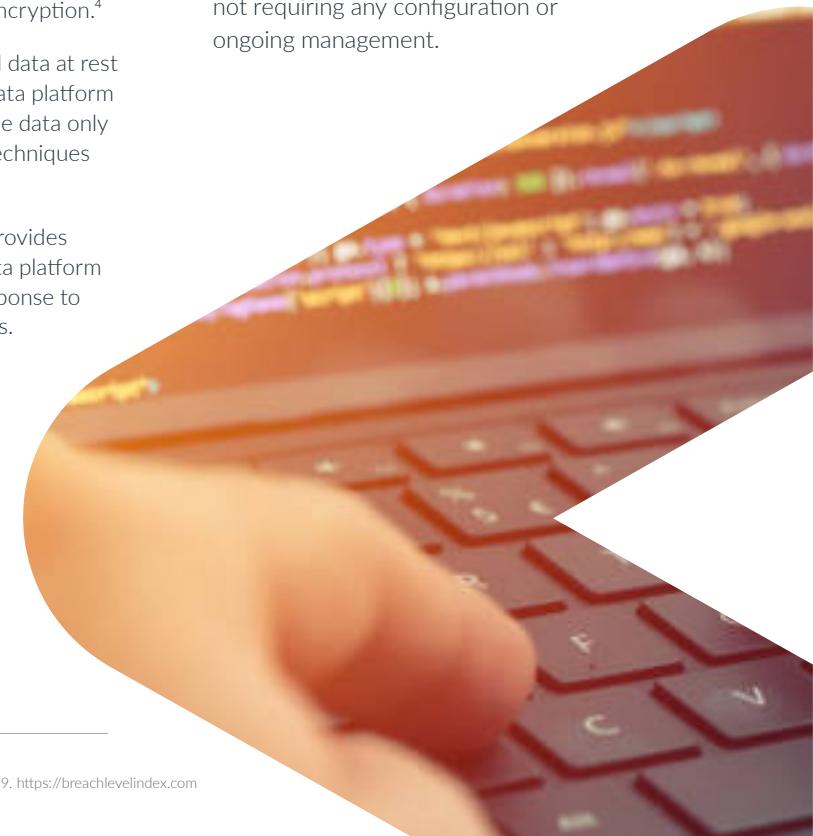
All but an infinitesimal number of data breaches involve the theft of data stored on-premises, shattering the myth that it's safer for organizations to protect their own data rather than migrating to the cloud. If there is data stored anywhere within the four walls of your agency, globally, your organization could be at risk.

SECURITY IS A CORE COMPETENCY

Snowflake's primary business is delivering a cloud data platform. Securing that data is core to Snowflake and was baked into the product since day one. We employ a constellation of world-class practices and technologies backed by industry security certifications to keep our customers' data safe. Our security measures include:

- **Safe data transmission:** All data that flows into or out of a Snowflake cloud data platform is encrypted in-transit, using best-in-class strong encryption.⁴
- **Access control and authentication:** All data at rest or moving within a Snowflake cloud data platform is fully encrypted. Users can access the data only through a combination of validation techniques called multi-factor authentication.
- **Data integrity measures:** Snowflake provides time travel, which restores a cloud data platform to a previous state, on demand, in response to accidental or intentional data deletions.

More often than not, if data warehouse vendors offer security features, they do so as options for customers to configure. Or even worse, they're provided as a set of building blocks that the customer has to assemble and manage. Instead, they should be built into the data platform and be completely automatic. They should also be regularly tested for correct functionality and their ability to resist attacks. A data platform built for the cloud has no choice: complete data security has to be built in. And the best cloud data platform will make data security automatic, not requiring any configuration or ongoing management.



³ <https://www.comparitech.com/blog/vpn-privacy/us-government-breaches/>

⁴ "Data Breach Discoveries From The Breach Level Index: Data Privacy and New Regulations Take Center Stage, 2018 First Half Review," Gemalto, February 18, 2019. <https://breachlevelindex.com>

REASON #4: COMPLIANCE THAT IS NEVER IN QUESTION

Snowflake is FedRAMP Authorized (Moderate) and meets all requirements to enable government agencies to achieve and maintain compliance with government regulations for cloud computing, including NIST 800-145 requirements; SOC1 Type 2, SOC2 Type 2, ISO 27001, FISMA Moderate, NIST 800-171, FIPS 140-2, and ARS 3.1 PCI DSS compliance; and it supports HIPAA compliance. The following sections cover these requirements in greater detail.

NIST 800-145 REQUIREMENTS

The National Institute of Standards (NIST) defines cloud computing as “a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction.”⁵

Snowflake meets the five essential NIST 800-145 requirements for cloud computing:

- **On-demand self-service:** Users can create a new data analytics platform for a specific mission/agency within minutes.
- **Broad network access:** Snowflake can access data sources on premises or in the cloud, and it also promotes use by heterogeneous thin or thick client platforms.

- **Resource pooling:** Multiple consumers can share a single virtual platform in a multi-tenant model, or individual virtual warehouses can be provisioned for each consumer, to query live data with Snowflake Data Sharing. In this way, Snowflake continues to offer the benefits and savings of cloud scale and elasticity to our customers and their customers.
- **Rapid elasticity:** Users can spin up or down resources to meet performance, data scale or volatile concurrency demands within seconds.
- **Measured service:** Snowflake bills consumption by the second. Resource usage can be monitored, controlled, and reported.

SECURITY AND ANTI-FRAUD COMPLIANCE

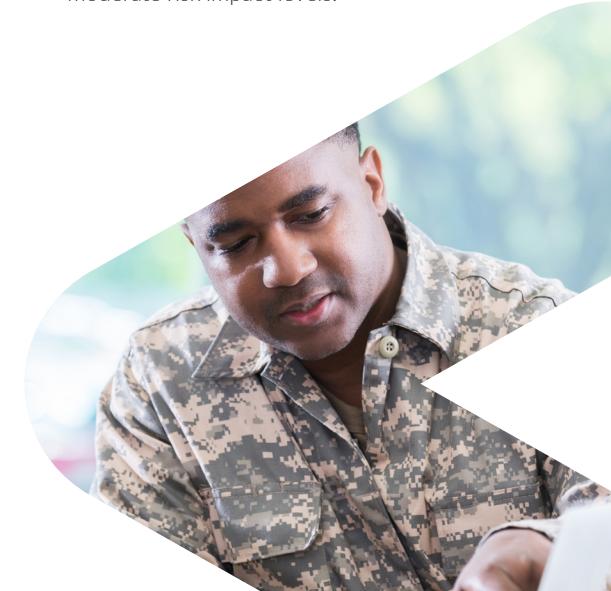
Security and fraud detection and prevention are built into Snowflake:

- **Best-in-class encryption:** Encrypts all data flowing into or out of Snowflake, both at rest and in transit.
- **Comprehensive protection:** Multi-factor authentication, role-based access control, IP address whitelisting, federated authentication, and annual rekeying of encrypted data protect data.
- **Private network connection:** Transmit data between your own virtual private network and Snowflake without accessing the Internet.
- **Security validations:** Snowflake is accredited for SOC1 Type 2, SOC2 Type 2, and PCI DSS compliance with support for HIPAA compliance. Snowflake is also FedRAMP Authorized (Moderate).

REGULATORY COMPLIANCE

Snowflake enables your agency to achieve and maintain regulatory compliance:

- **SOC1 Type 2, SOC2 Type 2:** Snowflake has completed attestation and audit.
- **HIPAA:** Snowflake is HIPAA compliant and is eligible to enter into a business associate agreement (BAA) with a covered entity.
- **PCI:** Snowflake is certified as PCI DSS compliant.
- **NIST 800-53:** Snowflake maintains technical and procedural measures in a manner consistent with NIST 800-53.
- **FedRAMP Authorized (Moderate):** Snowflake products hosted on AWS US East/West and Azure US East 2 are FedRAMP Authorized for up to moderate risk impact levels.



⁵ <https://nvlpubs.nist.gov/nistpubs/Legacy/SP/nistspecialpublication800-145.pdf>

REASON #5: INSTANT AND DISRUPTION-FREE SCALABILITY

Traditional data warehouse providers talk about performance. They may even have a story about performance “at scale”. However, scaling traditional solutions is laborious, costly, and almost always disruptive. When these solutions approach their compute capacity, they slow to a crawl, place workloads and users in a long queue, or even bump workloads and data to ease the pressure on the data warehouse. Upgrading the capacity of a traditional, on-premises data warehouse is very expensive and time-consuming. And these headaches don’t go away when vendors migrate these solutions from on-premises to the cloud. Traditional data warehouses were never designed for the cloud and thus many of the same limitations experienced on-premises also happen in the cloud.

Snowflake Cloud Data Platform provides performance and disruption-free scalability. Here’s why:

- **Independent but logically integrated storage and compute:** Snowflake physically separates but logically integrates storage and compute. This means you can easily increase one without having to increase the other. And since all storage objects are first-class in Snowflake, you experience the highest performance profile for all data as you take advantage of the near-infinite storage and compute resources available in the cloud.

- **Near-unlimited concurrency:** To meet your SLAs, you can choose any “T-shirt” size compute cluster available in Snowflake for each workload. You can dedicate these clusters to each workload, which means you can scale to as many concurrent workloads as you require. Need to support a few workloads for a few dozen users, or even a few hundred workloads for a few thousand users? It’s no problem with Snowflake. In addition, all workloads access the same, single copy of your data, which saves you time and money by avoiding data copying effort and costs.
- **Disruption-free, instant scalability:** As mentioned earlier, your Teradata solution is either underutilized or buckling under the strain of increasing workloads. On the flip side, Snowflake instantly scales up and down without disruption, automatically or on the fly. From a command line, a graphical user interface, or programmatically, you can easily set how you want Snowflake to operate. Also, you only pay for what you use in one-second intervals.

By taking full advantage of cloud-built computing, you’re no longer tied to the limitations of decades-old architecture and technology not built for the cloud. As a Snowflake founder has said: Legacy solutions were built for the scarcity of resources. Cloud solutions are built for unlimited resources.



REASON #6: ADVANCED ANALYTICS – AI AND ML ARE JUST THE BEGINNING

Easy access to enormous amounts of data by a broad set of users is fueling creativity that produces entirely new processes and novel ways to use data. This is what transformation is all about: as more government agencies move their data to the cloud, the volume and diversity of data will open doors to new ways to improve government and serve users and citizens more effectively and efficiently.

Artificial intelligence (AI) and machine learning (ML) require unlimited access to massive amounts of data at scale. Workloads such as these would melt a Teradata solution. For Snowflake, you instantly provision the amount of compute power you need, and you begin. And whatever resources you do provision, you will not impact the performance of your other, concurrent workloads.

AI EXPLORATION WITHOUT BOUNDARIES

As vastly as they may differ across government agencies, AI projects share a single trait: they all involve analyzing massive amounts of data. By providing limitless resources for storing and processing all manner of data (from within the agency and from external sources), a Snowflake cloud-built data platform affords a reliable base from which to explore how artificial intelligence can improve your agency's performance cost-effectively, without jeopardizing current workloads.



CONCLUSION: IT'S NOT HYPE, IT'S REAL

Government agencies are transforming into true, data-driven organizations with Snowflake's Cloud Data Platform, replacing their \$10 million Teradata appliances with pay-as you go, limitless cloud resources. They are reaping the benefits of using Snowflake and giving their agencies what's needed, right now:

1.  A single source of truth
2.  Dramatically lower IT costs
3.  Data security that is superior to on-premises protection
4.  Instant and disruption-free scalability
5.  A foundation on which to operationalize AI and ML

Embrace the future of cloud computing now. Take the first step toward replacing that \$10 million Teradata data warehouse in your data center with a Snowflake Cloud Data Platform.

To understand what's required to migrate from Teradata to Snowflake, [click here](#).



ABOUT SNOWFLAKE

Snowflake shatters barriers that prevent organizations from unleashing the true value from their data. Thousands of customers around the world mobilize their data in ways previously unimaginable with Snowflake's cloud data platform—a solution for data warehousing, data lakes, data engineering, data science, data application development, and data exchange. Snowflake provides the near-unlimited scale, concurrency, and performance our customers in a variety of industries want, while delivering a single data experience that spans multiple clouds and geographies. Our cloud data platform is also the engine that drives the Data Cloud—the global ecosystem where thousands of organizations have seamless and governed access to explore, share, and unlock the potential of data. Learn how you can mobilize your data at [snowflake.com/federal](https://www.snowflake.com/federal).

Snowflake is FedRAMP Authorized

