
AWS
re:Invent
NOV. 28 – DEC. 2, 2022 | LAS VEGAS, NV

PRT232

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How Unum accelerated cloud-powered analytics at scale

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Agenda

Data and analytics modernization requirements

Unum – Who are we?

Teradata – Long-time Unum partner with great capabilities

Determining the possible

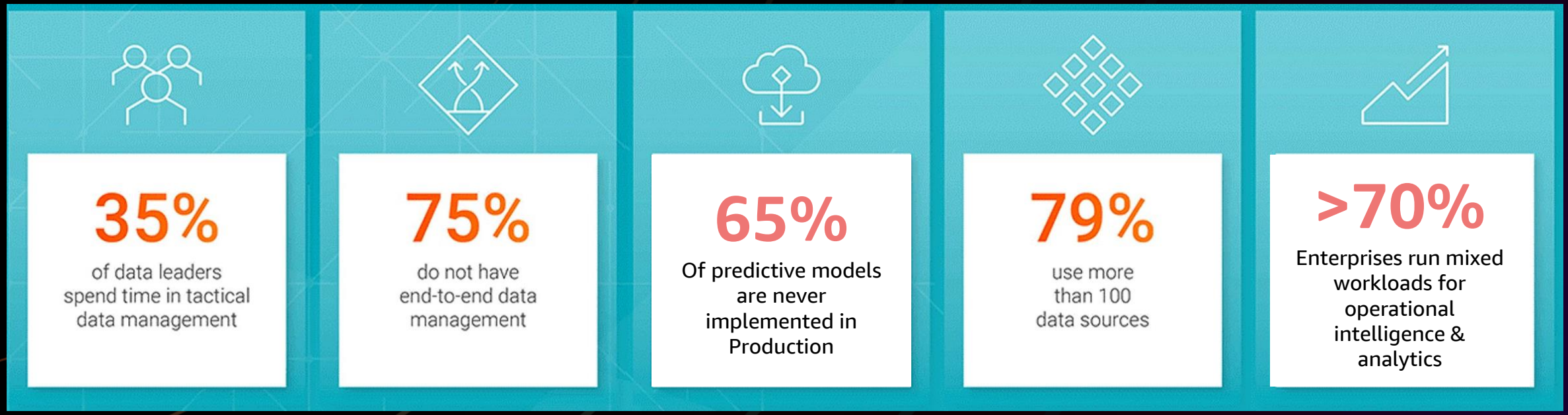
Executing on the possible

What's next

Teradata and AWS: Unlocking customer insights through innovation

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Significant cost, agility, and data challenges prevent organizations from accelerating digital transformation



Unlock data

Activate analytics

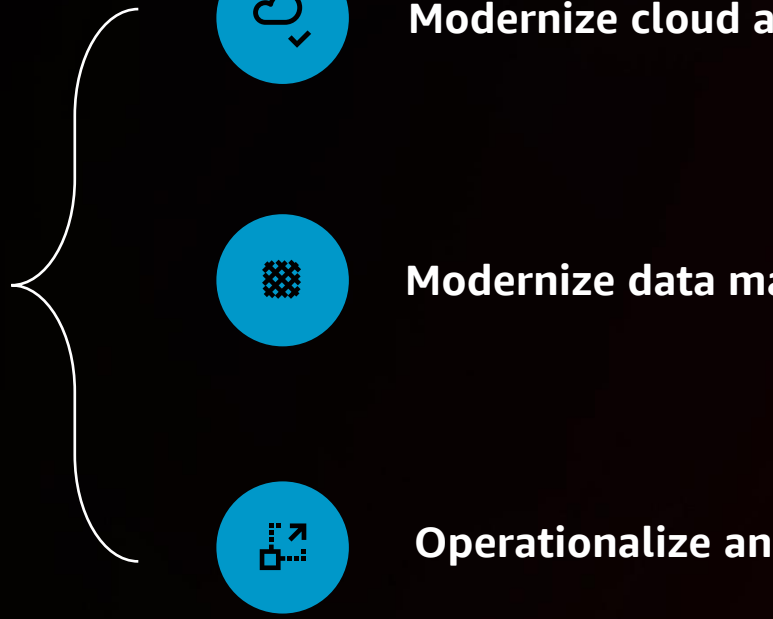
Accelerate value

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Customer needs for modernization

3

Key areas of modernization



Customer requirements	Capabilities
Modernize cloud architecture	• Agility in the cloud • Self-service • Multidimensional scale
Modernize data management	• Comprehensive data management • Data collaboration • Secure access and data protection
Operationalize analytics at scale	• In-database analytics • Bring your own analytics • Partner integration

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Teradata VantageCloud is evolving to provide more flexible support for modern data architectures



Centralized object storage

- Economical, durable, performant and ACID-compliant data storage, with time travel access
- Open data formats and support for multi-structured data
- Simplified data sharing



Multi-cluster compute with elasticity

- Simple, flexible and automated elastic scaling
- API-driven model for infrastructure-as-code deployment
- Built-in fault tolerance
- Zero downtime elasticity and upgrades



Business autonomy

- Self-service provisioning
- Separation of compute and storage
- Self-service data exploration with compute isolation
- Non-disruptive upgrades



Optimized pricing and governance

- Independent compute for simple chargeback . . .
- . . . with centralized financial governance to enable effective management of TCO, with reduced overhead



Open and connected

- Real-time ecosystem integration and connectivity
- Bring your own analytics/ML
- Cloud-native services integration – API-first design

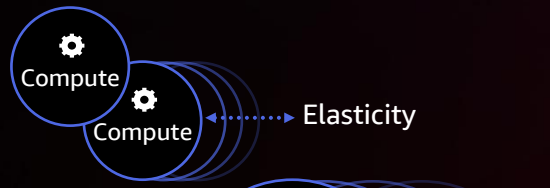
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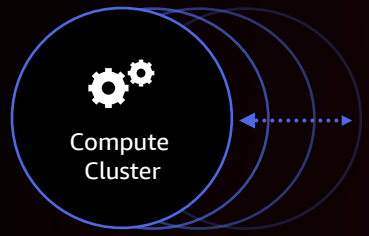
AWS services with Teradata VantageCloud Lake architecture overview



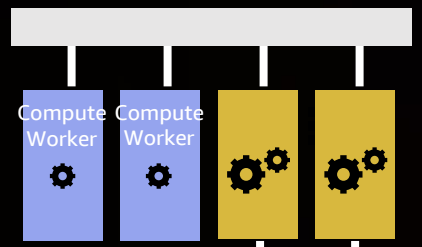
Self-service console



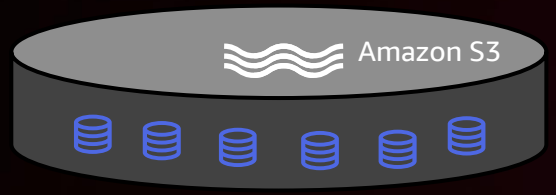




Primary cluster



Teradata file system on Amazon EBS storage



Block File System

Object File System

Self-service console hosted on AWS

- Web based self service console for system and user administration
- Web-based query editor
- Query and billing monitoring

Primary cluster with Amazon EC2 Amazon EBS storage

- Manages query planning and the distribution of work across the environment
- Manages the high-performance enterprise block storage for select operational queries
- Expand compute-only capacity with compute worker nodes

VantageCloud compute clusters with EC2

- Stateless query processing to support isolated workloads
- Multiple clusters with access to shared object storage
- Policy driven auto-scale elasticity by cluster

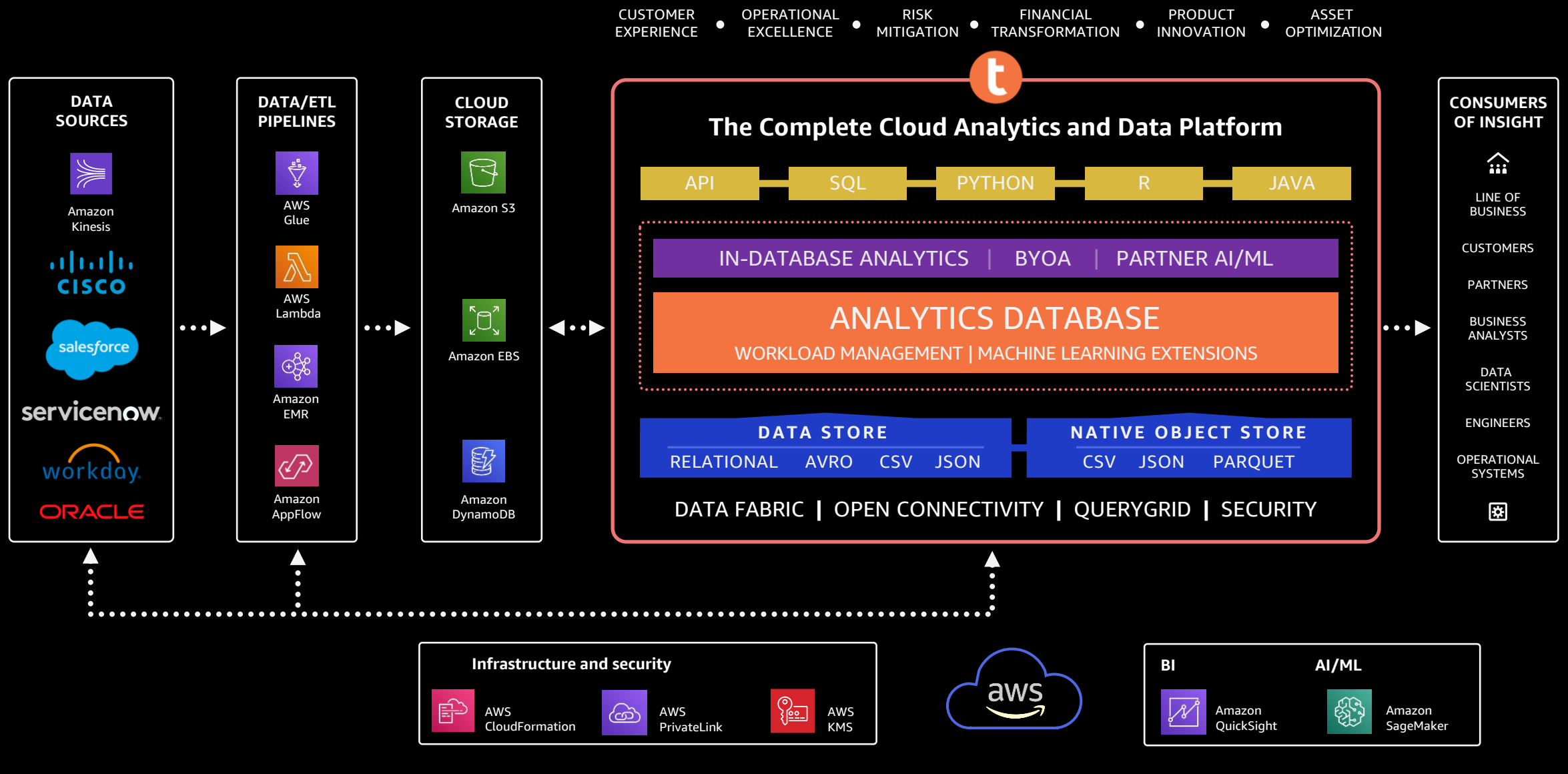
Object file system on Amazon S3

- Massively scalable low-cost storage
- Fully ACID compliant and optimized for performance including caching, optimized spool, indexed metadata

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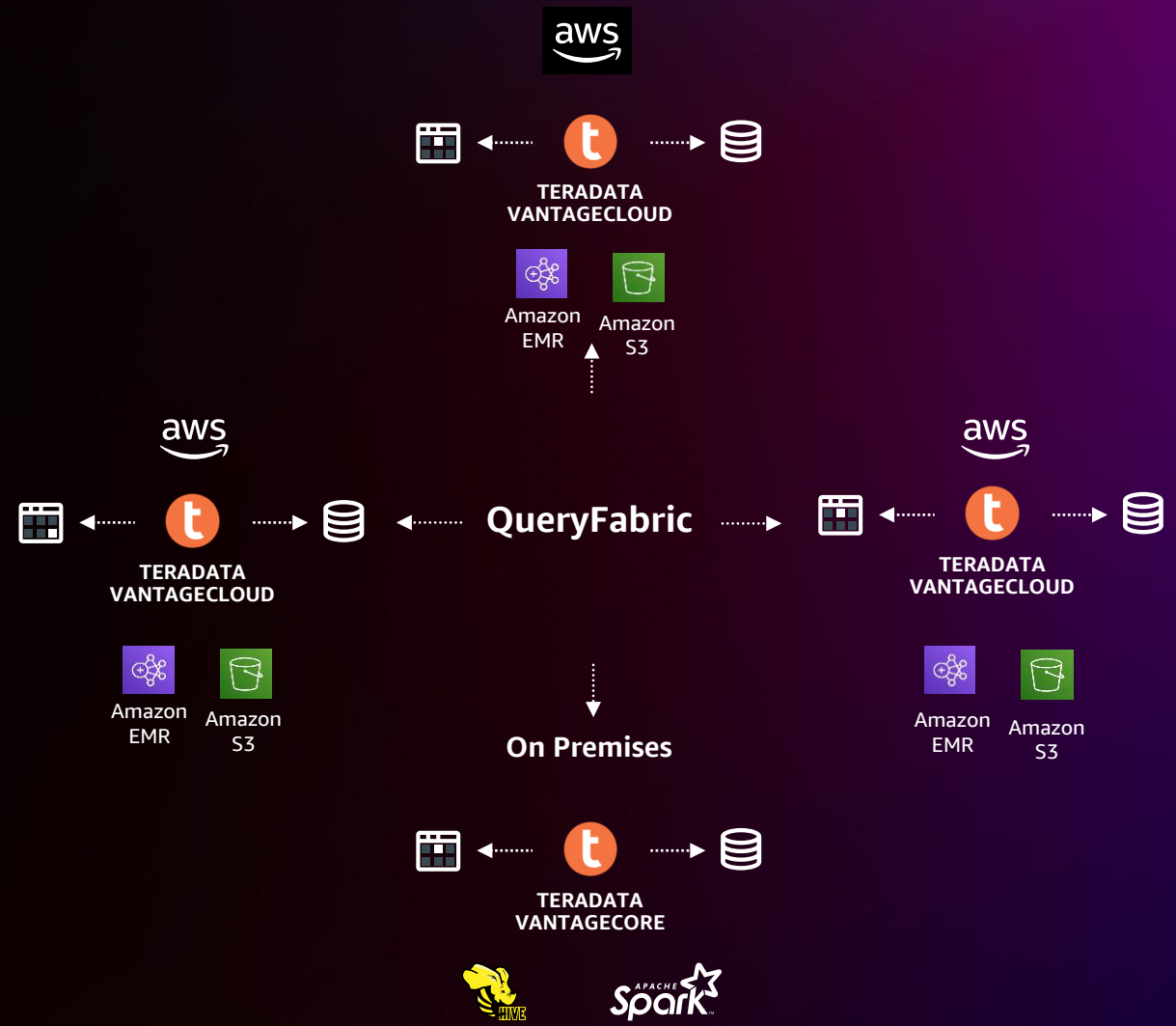
Teradata VantageCloud on AWS



Hybrid query fabric

INTELLIGENT, COMPREHENSIVE QUERY FABRIC

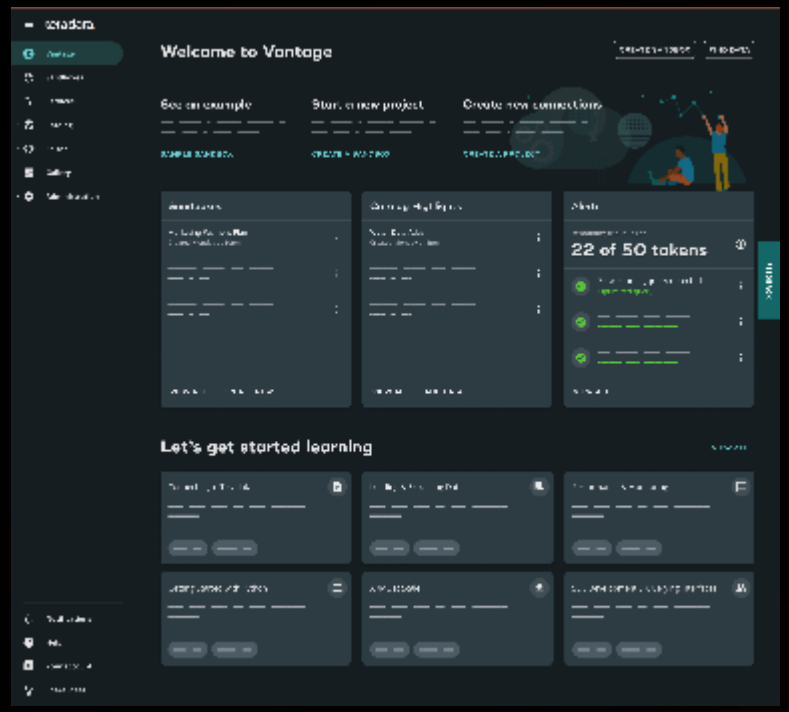
- Hybrid-ready enables pushdown processing minimizing data transfer and egress cost
- Comprehensive set of data sources connectivity
- Data search, explore, and understand the context behind the data
- Sharing data via AWS Marketplace internal and external to the organizations with governance



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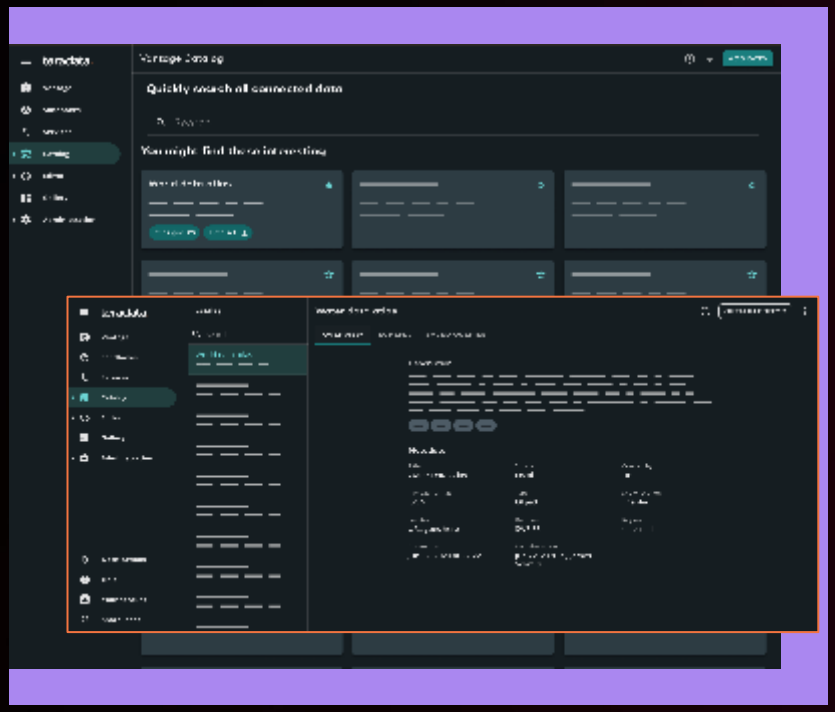
Self-service search, explore, and share with AWS services

1 Search and filter



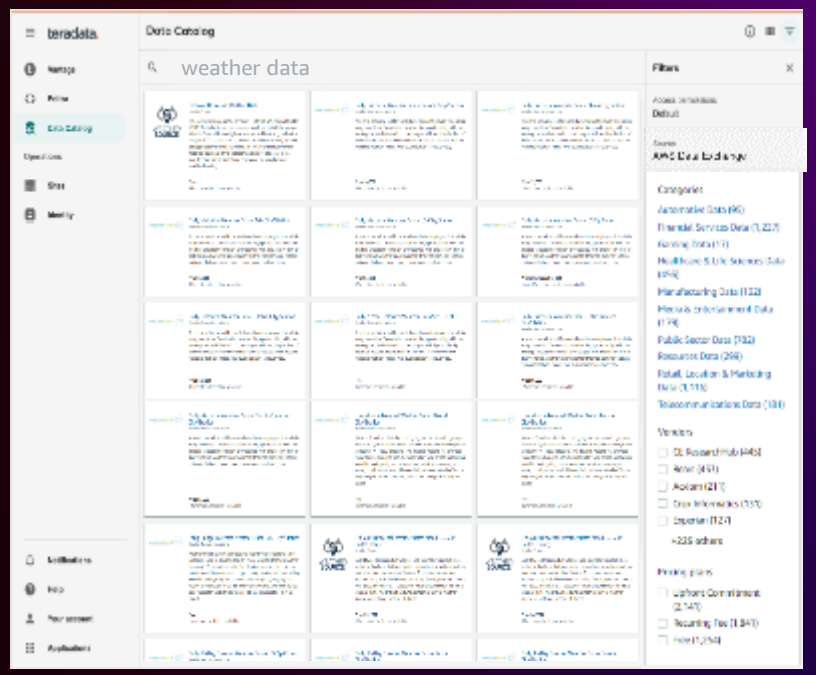
Keyword **search with AWS Glue** for unknown datasets
Explore format, provenance metadata

2 Browse and select



Allow users to merge and join relational and semi structure

3 Sharing via marketplaces



AWS data sharing marketplace integration to add more data

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Operationalize analytics at scale inside database

IN-DATABASE ANALYTICS

Geospatial, Time Series, Temporal, nPath

Powerful extensions to traditional relational operations

- **Geospatial Functions**
- **Time-Series Functions**
- **Temporal Functions**
- **nPath Functions**

- Implementation of standard ST_Geometry data type with rich set of spatial functions
- High-performance time-aware functions
- nPath analysis, Sessionize, Attribution working together are a core differentiator of Teradata

VantageCloud Analytic Library

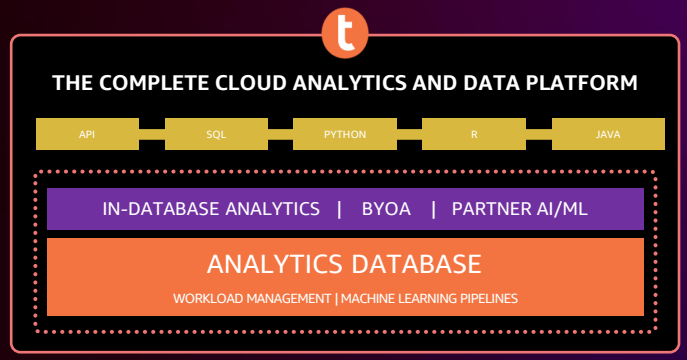
Suite of Advanced Analytic functions

- **Data Transformation**
- **Statistical Hypothesis tests**
- **Feature Engineering, PCA**
- **GLM, Clustering**

- Rich library of advanced functions from descriptive statistics, hypothesis testing, clustering, regression and predictive algorithms
- Use preferred languages R, Python, or SQL
- Available on any platform (Nov 2020)

Advanced SQL Engine

Advanced SQL Engine with native ML extensions arranged in analytic pipelines linked to industry models



- Highest performance possible
- New functions covering entire data analytics lifecycle
- Arranged in pipelines to support specific problems (e.g., classification, regression, time-series, segmentation, text processing)
- Linked to industry data models

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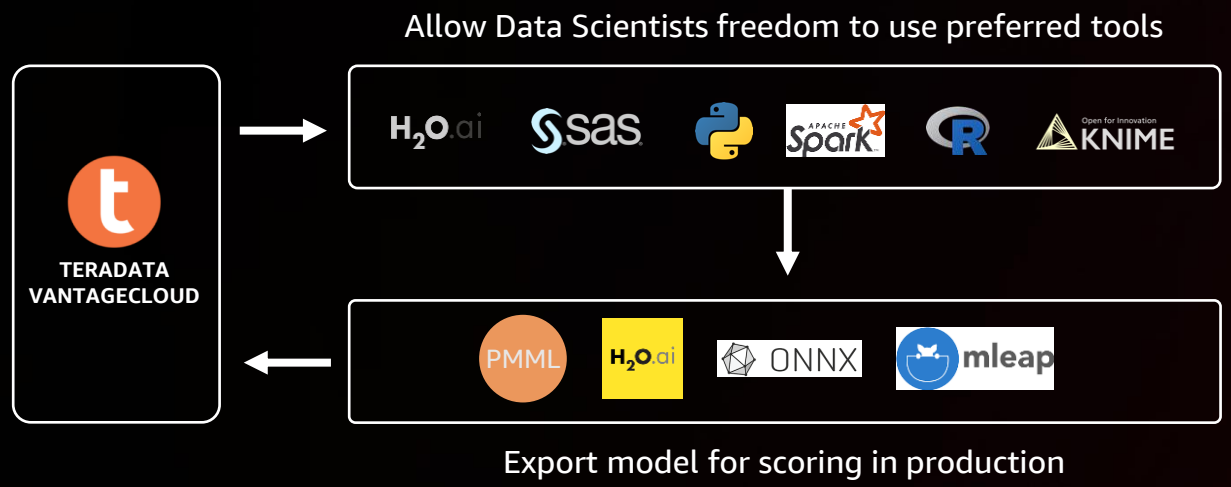
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Operationalize analytics at scale

BRING YOUR OWN ANALYTICS

Model Sharing

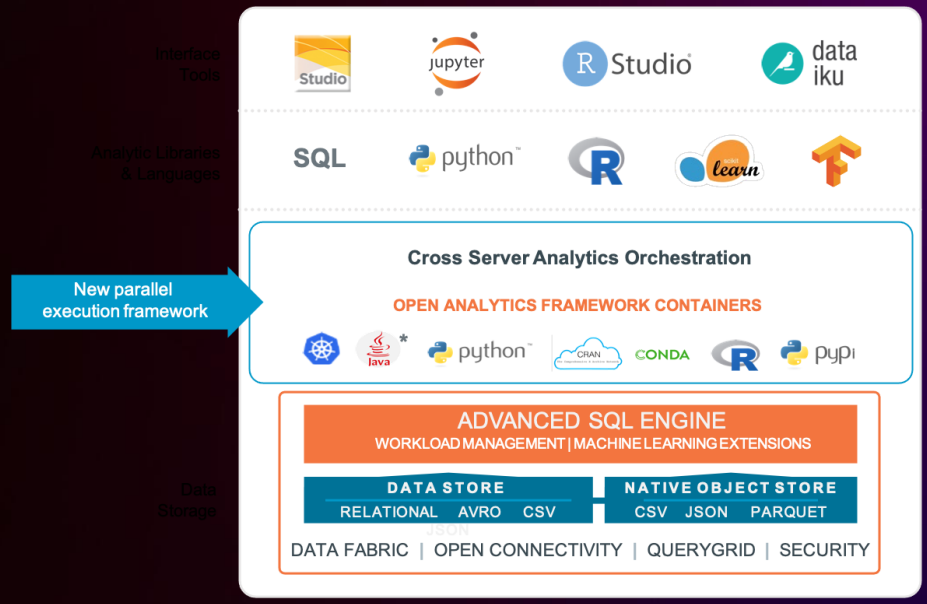
Import existing ML models into VantageCloud



- Data scientists use many different development platforms to create ML models. With Model Sharing these models can be imported into VantageCloud and used to score in-production workloads
- Allow data scientists freedom to use preferred tools

Open Analytics Framework

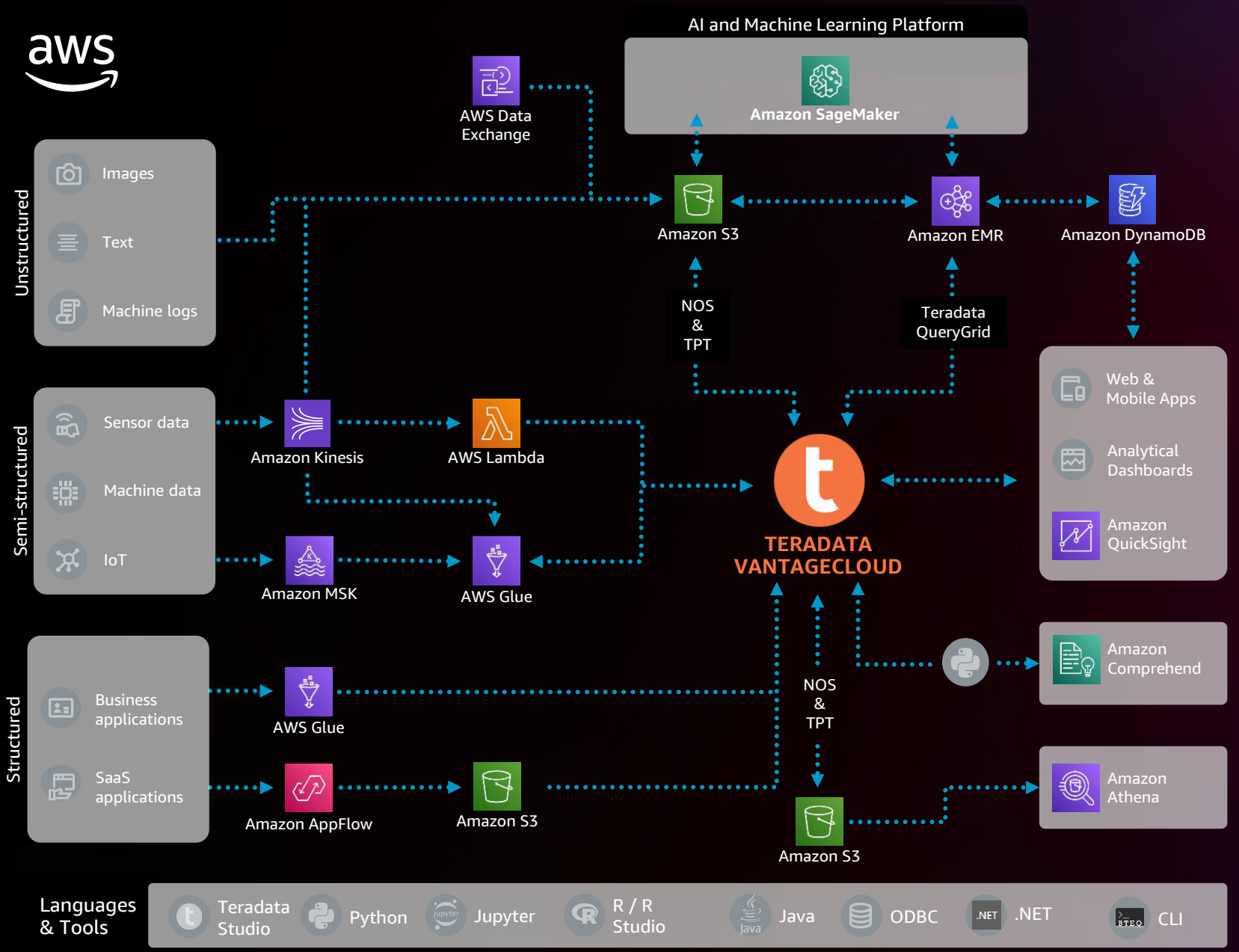
Advanced SQL Engine with native ML extensions arranged in analytic pipelines linked to industry models



- Execute R/Python code with data parallel computation
- Serverless architecture enables auto-scaling, with costs only for consumption

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INTEGRATIONS



ADDITIONAL INTEGRATIONS

- AWS PrivateLink — PRIVATE CONNECTIONS
- AWS Marketplace — OFFERING
- AWS CloudFormation — ORCHESTRATION
- AWS KMS — KEY MANAGEMENT
- Amazon EKS — KUBERNETES CONTAINERS
- Amazon EBS — PERSISENT STORAGE
- AWS CloudTrail — API MONITORING
- Amazon CloudWatch — RESOURCE MONITORING
- Amazon EBS Snapshots — RAPID BACKUPS

Note: Not all service integrations are shown.

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Capturing all workloads, driving growth in the data and analytics market requires agility and enterprise-grade price performance

Central high-performance data & analytics that run the business

ENTERPRISE ANALYTICS

Demanding risk and regulatory requirements

COMPUTE ISOLATION

Drive down the cost and risk of experimenting with new ideas

ANALYTICS INNOVATION



DEPARTMENTAL AND ONE-TIME NEEDS

- Project-based work
- Business hours vs. non
- Monthly/quarterly reporting

DATA LAKE EXPLORATION

Uncovering value in low-cost infinite storage

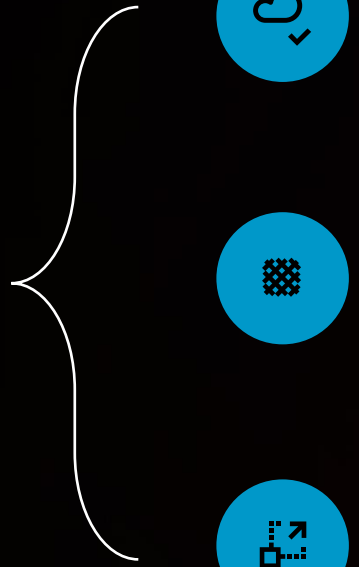
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Customer needs for modernization

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We are Unum!

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We are Unum

UNUM AT A GLANCE

Unum is a merger of five large companies

- Provident Life & Accident (Chattanooga, TN)
- Union Mutual Life (Portland, ME)
- Colonial Life & Accident (Columbia, SC)
- Paul Revere Life (Worcester, MA)
- Starmount Dental and Vision (Baton Rouge, LA)

Recent international acquisitions

- National Dental Plan (Dorking, UK)
- Primerica (Warsaw, Poland)



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We are Unum

FUN FACTS

Benefits Unum provides

- Group and individual accident and disability benefits (Long term and short term)
- Voluntary supplemental life insurance
- Voluntary dental and vision insurance

Unum is a Fortune 500 company

We protect 43M people and 182,000 businesses worldwide

$8.2B in benefits delivered in 2021

1 in 3 Fortune 500 companies offer Unum benefits to their employees

4.7

out of 5 rating

93%

of reviewers recommend our products

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Teradata and Unum

A strong partnership

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Teradata at Unum

STRONG PARTNERSHIP

Unum has partnered with Teradata since 1998 (24 years)

- Teradata has stood the test of time at Unum
- Continues to perform and service the business well
    - Stability
    - Support
    - Performance
    - Flexibility
- Capabilities embraced from Unum business communities

Can handle workloads and data in many forms and many platforms

- Analytical and operational workload consideration
- 300M queries per month



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Teradata at Unum

IN EVERY FACET OF OUR BUSINESS

Acquisition enrollment operations

Financial planning and operations

Benefits service centers

Enterprise reporting

Broker compensation

Benefits operations

Actuarial experience modeling

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Exploring the cloud

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Exploring the Cloud

WHAT WERE THE UNUM NEEDS?

Unum desires – and how does Teradata fit?

- Unum desire to get out of the data center business
  - Managing multiple data centers and equipment
  - Teradata married to mainframe data center locations
- Near 100% hyper converged infrastructure (HCI) with Nutanix

Business exploring in earnest new offerings and partnerships in the cloud

- Public clouds used for new applications as well as SaaS solutions
- Newer analytics at Unum (Salesforce, FINEOS, Pega, Tableau, Amazon SageMaker, etc.)
  - More advanced predictive modeling
  - AI/ML capabilities available in the cloud platforms (i.e., SageMaker)
  - Business process automations
- What can wrangle these cats?





Amazon SageMaker









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Exploring the cloud

IS UNUM READY FOR TERADATA VANTAGECLOUD ON AWS?

Yes, this will be very different . . . but have the same great functionality

This is going to be so different

- Teradata physical vs. virtualized
- 300M queries per month
- Heavy reliance on 4 mainframes
  - 1,250+ daily batch jobs, FICON to TCP/IP
  - Competing business needs competing for DR requirements and testing
  - It's time for a separation from collocation dependencies

Vantage is still Vantage (Cloud or not)

- No migration headaches with application compatibilities
- No code rewrites
- Minimal business disruption
- Lift and shift for me please!

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Modernizing in the cloud

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Modernizing in the cloud

THE JOURNEY

Change is hard for many, but can be easy

6-month plan to build, test, and go live from inception

- Mainly for business desire for contingent extended time for go-live production date
- Additionally due to other large initiatives and partnerships with our business – all the "good dates" taken through May 2022
- Schedule built to move all sub-production systems in 3-month timeframe, both data seeding and validation testing, and go-live
- Remember that mainframe thing? Turns out breaking up is not so hard to do!
- Ability to pre-test some production things (i.e., DR Snapshots) prior to moving to production

Migrated to Teradata VantageCloud on AWS over Independence Day weekend (kind of fitting)

- Migration Saturday and Sunday, July 2–3, 2022
- July 4 was available, but was not needed





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Modernizing in the cloud

IS UNUM READY FOR TERADATA?

Need a strong network infrastructure

- 100GB from Unum to Equinix and multiple 10GB VIFs to AWS
- Unum and Teradata networking teams melded well
- Made sure TTU w/ ODBC/JDBC/.NET leveraging much larger response blocksizes, 16 MB shovels vs. 64 KB teaspoons

Shift to cloud operations

- Unum is a demanding customer with seasoned Teradata support – remember, a 24-year customer
  - Teradata brought the right resources to bear at the right times
  - Things are different with Teradata SaaS services (backups, restores, utilities)
  - Learning on both sides – mainly around backups

Upgrade the infrastructure components

- Upgraded all RDBMS and TTU software from v16.20 to v17.10
- Exact same version of system on premises migrated to VantageCloud on AWS
- Made sure key applications worked well (IBM InfoSphere DataStage, Informatica, Tableau, and Qlikview)





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Modernizing in the cloud

OK…HOW'D WE DO?

12 out of 10 . . . really well

Invisible for Unum business community

- End users were using Vantage on premises one day and seamlessly on AWS the next
- Our business processes paused for a day while migration was completed and resumed normal operations once migrated with no issues

Glowing testimonials from Unum power users and operations

- "Wow. Cannot believe the blazing speeds – 98% improvements"
- "Batch now completing faster than it has in many years"
- "Month-end/quarter-end processing made much easier"

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What’s next?

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What’s next?

FUTURE STATE

Improve data integrations and opportunities

- Look at data from new perspectives and tools typically easier in the cloud
- Improved data lakes with less cost and improved governance
- Improved platforms for data exploration
  - Machine learning (ML)
  - Artificial intelligence (AI)
  - Advanced modeling and reporting capabilities



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Teradata & AWS: Unlocking customer insights through innovation

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What is AWS?

AWS provides a highly reliable, scalable, low-cost infrastructure platform in the cloud that powers millions of businesses in over 240 countries and territories around the world.

Agility	Teams can experiment and innovate quickly and frequently
Cost Savings	Only pay for what you use, leveraging economies of scale
Elasticity	Easily scale up or down with the needs of the business
Innovation	Focus on business differentiators, not infrastructure
Global Footprint	Extensive, reliable, and secure global cloud infrastructure



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What sets AWS apart?

Security	Fine-grained identity and access control; Build with the Highest Standards for Privacy and Data Security
Service Breadth & Depth; Pace of Innovation	200+ fully featured services to support any cloud workload; AWS released 3,084 significant features and services in 2022
Experience: 1M+ customers	Building and managing cloud since 2006
Global Footprint	84 Availability Zones within 26 geographic Regions, 17 Local Zones, 410+ Points of Presence (400+ Edge Locations and 13 Regional Edge Caches) in 90+ cities across 47 countries.
Machine Learning	More machine learning happens on AWS than anywhere else. Machine learning in the hands of every developer and data scientist.
Ecosystem	100,000+ APN partners from over 150 countries. The AWS Marketplace offers 50 categories, and 10,000+ Products
Enterprise leader	AWS positioned as a Leader in the Gartner Magic Quadrant for Cloud Infrastructure and Platform Services

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Teradata and AWS
Unlocking Customer Insights through Innovation

Together we deliver unmatched data analytics innovation that provide the business outcomes enterprises need

Fast time to Value & Low Risk Move to the Cloud

Same analytics software on-prem and in the cloud

Teradata workload migration tools to modernize in weeks, not months

Lower risk, highly secure

Open & Connected Analytics at Scale

Any data, anywhere

AWS services integrations

100+ partner connections

Deep industry models

Open BYOM and multi-cloud approach

Robust Workload Management

Prioritize analytics workloads based on business rules.

Support for complex, demanding environments.

Only company supporting sub-second, tactical queries at scale.

Low Total Cost of Ownership

Teradata discounts as an AWS strategic partner.

Reduced data movement = lower ingress/egress charges

Scale through performance, not added hardware.

Flexible AWS Marketplace Purchase Options

Purchase easily through the AWS Marketplace.

Utilize previously negotiated AWS commitments to pay for 100% of Teradata Vantage platform costs

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Teradata VantageCloud Integrates and Pulls Through AWS Services

Security

Vantage +


AWS PrivateLink

Connect multiple environments with Vantage analytics for secure data sharing and interoperability.


AWS IAM

Benefit from secure environments and customized access control, running in Teradata's VPC or the customer's VPC.


AWS KMS

Teradata uses KMS to manage cryptographic keys and control user access for secure Vantage SaaS environments.

Data Lake

Vantage +


Amazon S3

Build a data lake on AWS, eliminate data duplication, and have a 360-degree view of the business.


AWS Glue

Creates the schematic / data model to combine the value of Vantage analytics with a range of AWS services.


AWS Lambda

Built-in automation with Vantage SaaS offer; build data pipelines within Vantage and Amazon S3.


Amazon EMR

Seamlessly query Amazon EMR environments using Teradata QueryGrid.

Machine Learning

Vantage +


Amazon SageMaker

Use SageMaker model definition and scoring on common data residing in S3 coupled with Vantage NOS


Amazon QuickSight

Couples the leading analytics platform with flexible BI/visualizations to get clear answers to complex queries.

Performance

Vantage +


Amazon EC2

Realize optimized, high performance, and highly available compute instances on AWS.


Amazon EBS

Realize optimized, high performance, and highly available block storage on AWS.


Amazon Kinesis

Get real-time data flows / integration with Vantage for greatest agility.


AWS Auto Scaling

Leverage cloud elasticity to meet fluctuating demand.

Management & Optimization


Amazon CloudWatch

Teradata manages, monitors, and optimizes AWS infrastructure use for Vantage SaaS customers.


AWS CloudTrail

Enables governance, compliance, operational auditing, and risk auditing for Vantage on AWS usage.

Vantage +


AWS Cost Explorer

Teradata visualizes, manages, and optimizes AWS and Vantage costs to maximize customer value.


Savings Plans

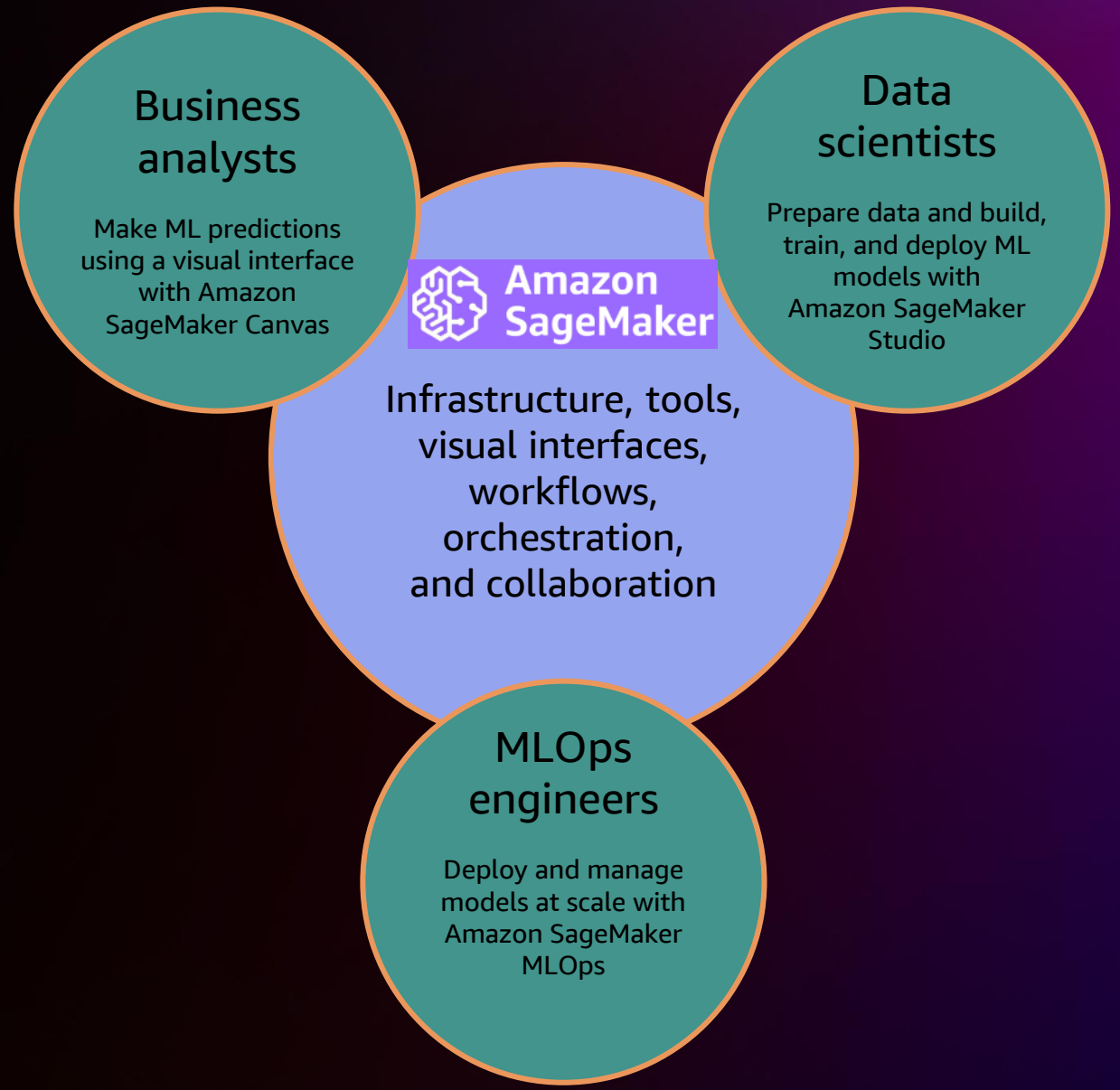
Teradata uses savings plans to minimize customer costs for Vantage SaaS subscriptions.


AWS Marketplace

The simplest, most streamlined way to procure Vantage on AWS.

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Amazon SageMaker helps organizations harness ML



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VantageCloud API integration with AWS analytic services

Operationalize Analytic Models with real-time access by Vantage Business Users



SQL queries

VantageCloud






SQL and analytic functions

Enterprise data

API

AWS AutoML services

- Amazon Forecast
- Amazon Fraud Detector
- Amazon Augmented AI
- Amazon Comprehend

AWS data science

Amazon SageMaker

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Analytics in Production at Scale

Analytics 1-2-3: Prepare, Train, Deploy with Teradata VantageCloud and Amazon SageMaker

teradata.

Amazon SageMaker

teradata.

1

2

3

Prepare data

Cleanse and prepare raw data:

- Data integration
- Data access and exploration
- Data cleansing
- Feature engineering
- Feature selection

Train model

Fit ML algorithm to the training data:

- Algorithm selection
- Test and train data-set split
- Model training and evaluation
- Model optimization
- Model export

Deploy model

Operationalize model to predict outcomes:

- Write back new features
- Import model to model repository
- Operational scoring
- Business process integration
- Model monitoring in production

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Why involve a partner?



Reach desired business outcome faster

Reduce your operational costs

Focus on innovation

Reduce security and compliance risk

Develop your skills

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Thank you!

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