

Teradata VantageCloud Enterprise

Cloud Service Description and Google Cloud Addendum

This Cloud Service Description applies to Teradata VantageCloud Enterprise. In addition, an Addendum to this Cloud Service Description exists for each cloud platform on which VantageCloud operates. The terms within this Cloud Service Description apply to the latest Generally Available (GA) offerings. If there are any conflicts between the terms of the cloud platform Addendum and the provisions of this Cloud Service Description, then such Addendum-specific terms shall apply and take precedence over the conflicting provisions of this Cloud Service Description. Such Addenda specify the following:

- Subscription features
- Applications
- Supported connectivity options
- Supported instances
- Supported regions
- Pricing options
- Responsibilities

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Appendix: Google Cloud Addendum

1. Teradata VantageCloud Enterprise

Teradata VantageCloud is Teradata’s flagship analytic platform offering, which evolved from the industry-leading Teradata Database.

Teradata VantageCloud Enterprise is an enterprise data analytics platform for pervasive data intelligence that enables the Customer to perform advanced analytics in the cloud. With VantageCloud, the Customer can integrate analytic tools, languages, and engines to get insights from data. With VantageCloud, Teradata manages the performance, security, availability, and platform operations of the Vantage Data and Analytics platform as further described in this Cloud Service Description and applicable addenda.

This Cloud Service Description consists of the following sections:

- Responsibilities – key responsibilities of Teradata and Customer
- License Tiers – elements available for each license tier
- Analytic Database Feature Descriptions – available features for the Analytic Database
- Teradata Application Descriptions – available Teradata applications
- Optional Analytic Capabilities – analytic capabilities that Customer must request
- Enterprise Support – available support services
- Operational Services – operational services Teradata performs
- Pricing Options – pricing for compute and storage
- Security – available security features and options
- Pre-General Availability (GA) Offerings – terms applicable to the use of features that are not released for General Availability
- Additional Services – services that customer may choose to order for an additional charge

2. Responsibilities

Teradata, the Customer, and the Cloud Service Provider all have their own responsibilities for the management of a Customer’s VantageCloud system as summarized in the VantageCloud System Management table below.

VantageCloud Enterprise System Management	
Responsibility	Responsible Party
Hardware	Cloud Service Provider
Data Center / Hosting	Cloud Service Provider
Initial Data Migration	Customer
System Availability Monitoring	Teradata (OS and Analytics Database software)
Software Patching and/or Upgrading	Teradata
Premier Cloud Support (software)	Teradata
Cloud Platform Support	Cloud Service Provider

VantageCloud Enterprise System Management	
Responsibility	Responsible Party
<p>Database Administration / Operations</p> <ul style="list-style-type: none"> • Database security monitoring – managing VantageCloud security roles, passwords, and access rights • Maintaining VantageCloud structures, space, users, and jobs • Monitoring alerts, queries, access locks, and database performance • Analyzing database activity and priority of jobs/queries to identify performance tuning opportunities • Managing consumption and query performance 	<p>Customer*</p> <p>* Teradata can take on some of these responsibilities with Teradata Database Administration and Operations (sold separately).</p>
<p>Operating System (OS) Administration / Operations</p> <ul style="list-style-type: none"> • OS security monitoring • Volume encryption • OS user administration for Teradata personnel 	<p>Teradata</p>
<p>Network Administration / Operations</p> <ul style="list-style-type: none"> • Restrictions / filtering of incoming traffic to VantageCloud environment 	<p>Teradata</p>
<p>Cloud Environment Administration / Operations</p> <ul style="list-style-type: none"> • Security monitoring of the VantageCloud environment • Cloud environment access management for Teradata personnel 	<p>Teradata</p>
<p>Backup and Restoration</p>	<p><u>Teradata</u> –</p> <ul style="list-style-type: none"> • Sets up the Default Backup Configuration • Backup Support and Restore Requests per defined scope <p><u>Customer</u> –</p> <ul style="list-style-type: none"> • Backup Lifecycle and Storage Policy Management • Backup Support (for exceptions and warnings) per defined scope • Encryption of data and management of secure zones as needed

3. VantageCloud Enterprise License Tiers

The following VantageCloud Enterprise License Tiers – Features and Functions table shows the categories of features and functions available in the latest version of VantageCloud for each license tier.

VantageCloud Enterprise License Tiers – Features and Functions			
Features and Functions	Base	Advanced	Enterprise
Customer Support Type	Premier Cloud	Premier Cloud	Premier Cloud
Elastic Performance on Demand (EPOD) <i>Note: Blended Pricing Option required.</i>		•	•
Consumption for VantageCloud <i>Note: Available for applicable as-a-service deployment options only.</i>			•
Teradata Columnar	•	•	•
Teradata Intelligent Memory		•	•
Row-Level Security	•	•	•
Secure Zones	•	•	•
Temporal	•	•	•
Workload Management		Teradata Integrated Workload Management (TIWM)	Teradata Active System Management (TASM)
Block Level Compression	•	•	•
Teradata Native Object Store	•	•	•

4. Analytics Database Feature Descriptions

This section describes the Teradata Analytics Database features that are available in the VantageCloud Enterprise license tiers.

- 4.1 Teradata Columnar gives the Customer the ability to store Customer Data in a table by column, instead of by row. In its simplest form, each column in the table becomes its own column partition.
- 4.2 Teradata Intelligent Memory identifies more frequently used data and places it in memory.
- 4.3 Row-Level Security allows the Customer to restrict data access on a row-by-row basis in accordance with Customer-site security policies.
- 4.4 Secure Zones allow the Customer to create one or more exclusive database hierarchies, called zones, within a single Teradata VantageCloud system. Access to the data in each zone and the database administration is handled separately from the VantageCloud system and from other zones.
- 4.5 Temporal tables store and maintain information with respect to time.
- 4.6 Workload Management can manage VantageCloud workload performance by monitoring system activity and by acting when pre-defined limits are reached.
 - a) TASM gives administrators the ability to prioritize workloads, tune performance, and monitor and manage workload and system health.
 - b) TIWM provides basic workload management capabilities (i.e., a subset of TASM) to customers without full TASM.

- 4.7 Block Level Compression is a required data compression feature and is enabled by default.
- 4.8 Native Object Store (NOS) enables the Customer to use standard Teradata SQL and APIs to search and query CSV, JSON, and Parquet format datasets located on S3-compatible object store platforms. The Customer can also write data stored on VantageCloud to S3-compatible object store platforms.

5. Teradata Application Descriptions

This section sets out the Teradata Applications that may be available with the Teradata VantageCloud Service. References to “Production Systems” are defined as all Customer Site IDs with System Use of “Production” in the Support Portal.

- 5.1 Teradata Viewpoint, or Viewpoint, is a web-based operations management portal for VantageCloud systems. Viewpoint provides a framework to display web-based applications, known as portlets, that enable users across an enterprise to customize tasks and to display options for their specific business needs.
 - a) Viewpoint with Teradata VantageCloud runs in single-system mode. VantageCloud customers run a single-system Viewpoint capable of monitoring and managing a single VantageCloud instance.
 - b) Viewpoint provides portlets for everyday management activities such as system and application administration, monitoring, and management with rewind capability, and Workload Management. Certain portlets that are available with Viewpoint for Teradata VantageCore are not available for VantageCloud since the functionality is provided through the Vantage Console or by Teradata (e.g., Backup and Recovery, Remote Console).
 - c) During the provisioning of VantageCloud in the Public Cloud, the Customer receives one (1) single-system Viewpoint for each VantageCloud system installed.
- 5.2 Performance Data Collection Reporting (PDCR) is a data collection application that provides data related to database performance and workload utilization.
- 5.3 Teradata Data Lab enables self-service business intelligence and analytics by simplifying the provisioning and management of the analytic workspace within a data warehouse. By allocating that workspace, Data Lab provides lab users with easy access to critical information without moving or replicating data. Data Lab also gives them the flexibility to both self-provision the space and experiment with new data and theories. Teradata Data Lab is only available for Production Systems. Teradata Data Lab implementation support is available through Teradata Consulting for an additional fee.
- 5.4 Teradata Data Mover copies data and objects, such as statistics and tables, from one Teradata system to another. Reducing the complexities of data movement, Data Mover leverages built-in, underlying technologies in the Teradata system to enable automation, control, and process monitoring. One Data Mover instance (including software license and associated infrastructure) is included as part of the Cloud Foundation, and up to three additional instances may be purchased. Data Mover requires implementation on all instances by Teradata Consulting for an additional fee.
- 5.5 Teradata QueryGrid delivers data access, processing, and movement across systems in heterogeneous analytical environments. QueryGrid provides a means both to connect to a remote system and to retrieve or insert data using SQL. In this way, users can access multiple data sources without replicating data in the warehouse. QueryGrid also enables specialized processing engines, such as Analytics Database and Apache Hive for Hadoop, to act as one solution from a user's perspective. Specifically, core enabling software links with processing engines to provide access to data and processing. The connectors then deliver bi-directional data movement and push-down processing across connected systems. QueryGrid requires implementation by Teradata Consulting for an additional fee.

- 5.6 Teradata Query Service is middleware that provides a REST API for connecting to VantageCloud. The Teradata Query Service lets customers open database sessions, submit SQL queries, and access both responses and metadata through an Open API REST interface.

6. Optional Teradata VantageCloud Analytics Capabilities

Customers can opt for the following VantageCloud Analytic Capabilities, at no additional charge, via a VantageCloud Change Request:

- 6.1 Vantage Analytics Library (VAL) provides the data scientist with over fifty advanced analytic functions built directly into the Analytics Database. These functions support the entire data science process, including:
- a) Exploratory data analysis
 - b) Data preparation and feature engineering
 - c) Hypothesis testing
 - d) Statistical and machine learning model building and scoring.
- 6.2 Bring Your Own Model (BYOM) consists of code and libraries that enable Data Scientists to predict (or score) machine learning models in standard interchange formats, such as PMML (Predictive Model Markup Language) and H2O MOJO (Model Object, Optimized), against data in VantageCloud. The BYOM function can be invoked via SQL query, Python, and R languages to utilize the stored Machine Learning (ML) model to score Enterprise Feature Data and to predict the likelihood of a particular outcome.
- 6.3 Standard User-Defined Functions (UDF) let the Customer create a function by using code in SQL, C, C++, and Java that can be executed directly on the VantageCloud platform. The Customer can then bring to VantageCloud their customer UDF source code and binaries for C/C++ UDFs, as well as binaries and compiled code for Java UDFs. With this capability, the Customer can add functionality not natively supported by VantageCloud. Before deploying them on VantageCloud, however, the Customer should thoroughly test their UDFs for any unwanted effects of data stored in the system (e.g., performance, security, system availability, confidentiality, integrity).
- 6.4 Vantage Python and “R” Open Analytics. Teradata VantageCloud provides Python and “R” analytics in two forms: client and server-side analytics. The free, downloadable client Python library (teradataml) and the “R” library (tdplyr) enable users both to access business data in VantageCloud and to transform it into dataframes. Users can also use VantageCloud native functions to process them in-database. Meanwhile, server-side Python and “R” analytics give users the ability to run the Python/“R” scripts with the open-source analytic libraries where the data reside. VantageCloud Script Table Operator (STO) and ExecR capabilities enable partitioned data model training and scoring in parallel at high performance. With these VantageCloud capabilities, users no longer need to export data to another platform, thereby avoiding the added complexity and lower performance associated with that process.

7. VantageCloud Enterprise Support

Teradata provides integrated maintenance and support services for all VantageCloud Enterprise subscriptions, including defined coverage hours and response times, access to the Support Portal, Vantage Console, and other features.

- 7.1 **Support Portal and Vantage Console.** VantageCloud Enterprise Support and Operational Services are accessible through both the Support Portal and Vantage Console.
- a) **Support Portal** (support.teradata.com) gives the Customer 24 x 7 access to both support-related features (e.g., Support Tickets and analytics) and self-service features (e.g., Customer dashboards, Service Requests and Knowledge).
 - b) **Vantage Console** (cloud.vantage.teradata.com) allows the Customer to use the web-based, self-service Vantage Console to monitor and manage VantageCloud systems. Depending on the Customer's order, available features may include:
 - i. View VantageCloud site metrics and utilization trends
 - ii. Scale VantageCloud compute power up or down, scale instances out or in, and stop or restart instances without affecting persistent storage (for applicable Blended Pricing options only)
 - iii. Track VantageCloud Units used for Consumption pricing for VantageCloud offering
 - iv. Manage the Backup Lifecycle and Storage Policy
 - v. View network application IP addresses
 - vi. Administer Native Object Store (NOS) Policies
 - c) **Account management** for the Vantage Console has three main features:
 - i. Vantage Console access is controlled through the Support Portal for all users.
 - ii. Support Portal users with Admin rights will have the Site Super Admin role.
 - iii. Support Portal users without Admin rights will have Read-Only access.
- 7.2 **Support Tickets.** Customers can submit Support Tickets (i.e., Cases, Change Requests, and Service Requests) through the Support Portal, which is available 24 hours a day, 7 days a week, 365 days a year. Teradata uses best practices from the Infrastructure Technology Information Library (ITIL) for VantageCloud Support Tickets. The Support Ticket Types and Reporting Options table (below) illustrates these options.

Support Ticket Types and Reporting Options	
Support Ticket Type	Reporting Options
Case	<ul style="list-style-type: none"> • Support Portal • Telephone (S1, S2 Cases only): 1-877-MY-TDATA, Option 3 • Automatic Case Creation: Generated by Teradata systems
Change Request	Support Portal
Service Request	Support Portal

- a) **A Case** is a record to track customer issues, requests, and resolution activity.
 - i. When opening a Case in the Support Portal, the Customer must select a severity level based on the level of impact (see the Case Severity Levels table below).
 - ii. Teradata will respond to Cases based on the assigned Severity Level.
 - iii. Teradata also provides automated event management to monitor VantageCloud health and to create Cases.

- iv. In some instances, Cases may be set to a State of “Awaiting Info.” When that happens:
 - a. The Case resolution duration pauses until the Customer responds.
 - b. If no response is received within 14 days, the Case closes automatically.
- v. Once a solution has been provided in a Case, the State is set to “Resolved.” When that happens:
 - a. The Customer needs to review the update and either Accept or Reject the solution.
 - b. If the Customer does not respond within 14 days, the Case will close automatically.

Case Severity Levels		
Severity	Impact	Description
S1 (Critical)	The mission-critical Production System is down, corrupted, or severely degraded or is unusable and requires immediate attention to return the system to service.	Daily business is being critically impacted, causing revenue/risk exposure. Users are unable to perform primary functions; no workaround exists. Many users cannot access the system or login. <i>Note: If the Customer submits an S1 Case, they must allow Teradata to contact appropriate escalation personnel. If the appropriate personnel are not available, Teradata will change the Case from S1 to S2 and respond accordingly.</i>
S2 (High)	The Production System is up and operational, but the issue has severe, ongoing, daily impact to operations; a non-mission critical system is down and requires expedited engagement and urgent resolution.	If not resolved, daily operations will be impacted. Many users are unable to perform primary functions; no workaround exists which significantly affects ability to sufficiently achieve business objectives. Many users are affected.
S3 (Medium)	The issue interferes with normal work efforts, but work can continue. System response / performance is degraded. Non-critical application functionality is not available.	Medium and manageable impact to business, with little revenue/risk impact. Users are unable to perform secondary functions without a sufficient short-term workaround. Several users are affected.
S4 (Low)	A minor issue exists; normal operations can continue. Functionality is impacted, but not down.	Issue has no business impact and low impact to operations. Additional research or information is needed to address a question. Impacts only a few users.
S5 (Planned)	No issue exists; normal operations can continue.	No business impact exists. Teradata uses this severity level for proactive, planned Cases.

- b) A Change Request is a request to change something about a system. These changes can include the need to add, modify, configure, upgrade, or even decommission a site or discontinue use of a service component, application, or other associated elements.
 - i. Customers can submit new “Normal” Change Requests and view existing Change Requests in the Support Portal.
 - ii. Teradata can designate the Change Request as one of three types:
 - a. Standard – Low risk, pre-approved change plans that follow a specified and repeatable procedure or work instruction. These changes do not require case-by-case approval.
 - b. Normal – Changes without predefined plans that require both Customer approval and approval from the Teradata Cloud Change Advisory Board (i.e., a formal approval authority whose function is to control changes to the approved VantageCloud architecture).

- c. Emergency – Unplanned changes necessary for service restoration. These changes require Customer approval and approval from the Cloud Change Advisory Board. An Emergency Change can only be created in one of the following situations:
 - The Change is necessary to restore service and is recommended by Teradata Services SMEs during an S1 case investigation.
 - The change must be for the same account as the Severity 1 case.
 - A critical security vulnerability exists and, if not expeditiously corrected, could cause harm to the Cloud environment and its customers.
- iii. Teradata will schedule the action taken in response to a Change Request in advance and will coordinate the date and time with both the Customer and the assigned Teradata resource.
- c) A Service Request is a predefined service or work request. Some Service Requests may go through an approval process or include tasks that must be completed by Teradata. When these requests are submitted to Teradata, they are assigned to the appropriate specialists to complete. Customers can submit new Service Requests and view existing Service Requests in the Support Portal.

7.3 Support Levels (i.e., Premier Cloud Support or Priority Service) define the types and standards of services to be offered.

- a) Premier Cloud Support (included) provides integrated maintenance and support services for all VantageCloud Enterprise subscriptions with access to the Support Portal and Vantage Console, downloadable software, knowledge base searching, communities and forums, and other features. Premier Cloud Support coverage hours, acknowledgement response times, and status update cadence are described in the Premier Cloud Support table below.

Premier Cloud Support					
	S1 (Critical)	S2 (High)	S3 (Medium)	S4 (Low)	S5 (Planned)
Case Coverage Hours	24 x 7	9 standard business hours, 5 business days per week ¹			N/A
Case Acknowledgement	2 hours	2 hours ¹	Next business day ²		N/A
Customer Status Updates	Every hour	Every 6 hours ¹	Daily ¹	Weekly	N/A
¹ Same business day: Monday – Friday (time zone of the cloud deployment region) ² Next business day example: If the customer opens an S3 or S4 Case after 8 pm Friday, Teradata will respond after 9 am Monday. Note: Support is provided in English only. Local language support is not provided.					

- b) Priority Service (sold separately) enhances Premier Cloud Support by providing customers with increased VantageCloud Support coverage hours and accelerated response times for certain Case severities as described in the Priority Service table below.

Priority Service					
	S1 (Critical)	S2 (High)	S3 (Medium)	S4 (Low)	S5 (Planned)
Case Coverage Hours	24 x 7		9 standard business hours, 5 business days per week ¹		N/A
Case Acknowledgement	30 minutes		2 hours ¹	Next business day ²	N/A
Customer Status Updates	Every hour	Every 6 hours ¹	Daily ¹	Weekly	N/A
¹ Same business day: Monday – Friday (time zone of the cloud deployment region) ² Next business day example: If the customer opens an S3 or S4 Case after 8 pm Friday, Teradata will respond after 9 am Monday. Note: Support is provided in English only. Local language support is not provided.					

8. VantageCloud Operational Services

Teradata provides both the initial System Provisioning and the day-to-day operational services for VantageCloud, including Access Management; System Monitoring and Telemetry; Upgrades and Maintenance; and Backup and Restoration Services.

8.1 System Provisioning

- a) Teradata will provision and configure the VantageCloud system in accordance with an architecture design approved by both parties.
- b) Teradata will configure the VantageCloud system to facilitate the Customer's network connectivity per the architecture design. This process may include collaborating with the Customer to perform a network handshake.
- c) The Customer is responsible for configuring their infrastructure to connect to VantageCloud. This process may include:
 - i. Configuring the Customer's networks for all applications to connect to the VantageCloud system on appropriate ports and protocols.
 - ii. Configuring the Customer's infrastructure components and cloud services including, but not limited to, gateways, endpoints, access profiles, firewalls, DNS & proxy servers.
 - iii. Approving and maintaining outage windows to perform migrations, assessments, and network tests.
- d) Teradata will notify the Customer of the VantageCloud Service Availability Date.
- e) As of the Service Availability Date, the Customer is thereafter responsible for:
 - i. Registering to use the Support Portal and Vantage Console
 - ii. Retaining the DBC password
 - iii. Upgrading Teradata Tools and Utilities (TTU) software on all Customer devices that connect to VantageCloud
 - iv. Maintaining the Customer network connections to VantageCloud

8.2 Access Management (i.e., Support Role Assignment). The Customer is responsible for assigning and maintaining Support Portal and Vantage Console Customer roles as shown in the following table.

Support Portal and Vantage Console — Customer Roles and Functions	
Customer Roles	Functions
Support Portal Admin <i>Note: Teradata recommends assigning two or more Support Portal Admins.</i>	<ul style="list-style-type: none"> • Site Super Admin access to the Vantage Console • Approve all access requests • Grant site roles to customer contacts • Setup and manage Backup Jobs • Grant Secure Password Vault responsibilities
Cloud Service Owner	<ul style="list-style-type: none"> • Site Super Admin access to the Vantage Console • Setup and manage Backup Jobs
Change Control Contact	<ul style="list-style-type: none"> • Approves Change Requests • Approves maintenance schedules
Event Notification Contact	<ul style="list-style-type: none"> • Default Customer contact for both Teradata-owned Cases and Cases generated from system events • Notified and/or added to Case watchlists
Remote Access Contact	Support contact for system credentials
Primary Teradata Support Contact	Primary customer contact for escalations
Customer User	<ul style="list-style-type: none"> • Create, track, and manage Support Tickets • Read-Only Site access to the Vantage Console • View Backup Jobs

8.3 System Monitoring and Telemetry

- a) Teradata Support Service tools and Performance Data Collection Reporting (PDCR) must be deployed upon provisioning and remain active for VantageCloud Support.
- b) To remain active, Support Service tools require database-level service accounts (e.g., Viewpoint and PDCR) with default access rights.
- c) If required for Teradata to provide support or troubleshooting access, the Customer must provide database and application-level credentials via Secure Password Vault or other approved / established mechanism for Teradata to fulfill service agreement responsibilities.
- d) Teradata may modify the support tools to provide VantageCloud Support and Operational Services.
- e) Teradata collects additional telemetry data to aid Teradata in detecting, troubleshooting, or resolving issues; gauging, analyzing, and optimizing performance and functionality; and providing feedback and recommendations related to the services that the Customer is receiving from Teradata. The data collected is further described in the telemetry collection and analytics guide available at docs.teradata.com. If Customer limits or interferes with Teradata collecting such information, Teradata will be unable to provide the security, operations, availability, billing, and other services that make up the Teradata Cloud Service as described herein.

- f) To help them build their data and analytics strategy, the Customer has the option to share additional data with Teradata to leverage available Industry Data Models and business value frameworks. This additional data collection can include:
 - i. Detailed performance metrics
 - ii. Usage metrics by user-id / customer-metadata
 - iii. Object usage - database, table, and column names metadata
 - iv. Obfuscated (non-PII) user information

8.4 Upgrades and Maintenance

- a) Scheduled Downtime refers to all scheduled or Customer-approved outages of the VantageCloud System including planned maintenance, major upgrades, and system resize (growth or reduction).
- b) Maintenance Windows are used by Teradata to perform service maintenance and include Scheduled Downtime. For instance, Teradata uses monthly service maintenance windows for regular service updates to maintain the currency of infrastructure, security, patches, and maintenance releases.
 - i. The Customer must identify a monthly Outage Maintenance Window (i.e., six hours) upon system installation, subject to availability of the outage window timeframe. This maintenance window will be used to perform activities that may require the system to be offline or otherwise require a database outage. Teradata will assign an outage maintenance window to Customers who do not identify an outage maintenance window.
 - ii. The Customer can optionally schedule maintenance not affecting availability during an additionally designated, non-outage maintenance window.
 - iii. The Customer can use a Change Request for ad-hoc maintenance needed outside of the monthly maintenance window.
- c) Software Upgrades to the latest version of VantageCloud occur as new versions are released and are also used to patch the Operating System.
 - i. To minimize disruptions, the Customer and Teradata coordinate upgrade schedules. Teradata provides a minimum four-month notice for major version upgrades to the analytic engine (i.e., major upgrades) so the Customer can test application compatibility and validate new versions. Software upgrades will occur during the monthly Outage Maintenance Window.
 - ii. As new versions are released, the Customer must upgrade the Teradata Tools and Utilities (TTU) software on all Customer devices that connect to VantageCloud to ensure compatibility and stability.

8.5 Backup and Restoration Services

- a) Data Protection Plan (Backup and Recovery). After initial configuration by Teradata, the Customer can create and manage Data Protection Plans using the Vantage Console. A Data Protection Plan defines the schedule, frequency, and retention policy for data backups using either Standard or Snapshot Backups. Available Backup storage and retention policies depend on the cloud platform that the Customer chooses for VantageCloud deployment.
 - i. "Data Protection Plan" refers to a defined set of rules used to perform system backups according to a predetermined schedule and lifecycle (retention) policy.
 - ii. "Backup" is the performance of the Data Protection Plan and can include a single or multiple Backup Jobs.
 - iii. A "Backup Job" is the job used to perform the backup per the Data Protection Plan.

- b) Support Portal and Vantage Console. The Backup Services described in this section are accessible through the Vantage Console and Support Portal.
- c) Backup Pricing Options. The Cloud Service Description Addendum for each specific cloud platform describes available Backup Pricing Options.
- d) Backup Onboarding. During System Provisioning, Teradata will configure the Data Protection Plan per the Default Backup Lifecycle Policy. In addition, Teradata will give the Customer instructions on how to modify their Data Protection Plan. The Customer can modify the Data Protection Plan at any time through the Vantage Console.
- e) Default Backup Lifecycle Policy. The Default Backup Lifecycle Policy defines the default frequency of Backup Jobs and the number of copies to be retained. The Default Backup Lifecycle Policy is defined in the Subscription Features / System Backups section of the Cloud Service Description Addendum for the relevant platform.
 - i. The Backup Jobs will be scheduled outside of the Customer’s business window or at a customer-selected time.
 - ii. Older Backup Jobs will be deleted automatically.
 - iii. Backups are encrypted at rest using cloud provider-managed encryption keys.
 - iv. Backups are retained in the same cloud provider region where the Vantage Cloud instance is located.
- f) Backup Lifecycle and Storage Policy Management. After initial deployment, the Customer can change or modify the Default Backup Lifecycle Policy via processes in the Vantage Console or Support Portal.
 - i. Backup Jobs are run as an automated process and will continue per the requested policy unless modified or cancelled.
 - ii. If a customer creates a backup policy, the Customer is solely responsible for managing that backup policy.
 - iii. Through the Vantage Console and/or Support Portal, the Customer can perform the backup services shown in the Backup Services and Availability table below.

Backup Services and Availability		
Backup Services	Availability	
	Support Portal	Vantage Console
Enable daily, weekly, or monthly backups	•	•
Disable scheduled Backup Jobs	•	•
View the status of upcoming and previously executed Backup Jobs	•	•
Sign up for weekly backup status reports by email	•	•
Enable auto-restart to re-run a failed Backup Job one time		•
Re-run Backup Jobs		•
Cancel in-progress Backup Jobs		•
Change default and custom backup schedules		•
Edit backup retention policies <i>Note: The Cloud Services Description (CSD) Addendum for the specific cloud platform the customer chooses provides the backup retention terms.</i>		•

Backup Services and Availability		
Backup Services	Availability	
	Support Portal	Vantage Console
Configure email alerts indicating the Backup Job's status (i.e., start, failure, completed successfully, completed with exception(s), completed with warning(s), and/or schedule changes)		•
Configure Backup Job priorities		•
Restore a full-system Snapshot Backup		•
View backup storage utilization over time		•

- iv. Backup Jobs can be configured to run daily, weekly and/or monthly.
- v. The Customer may set completed backups as “do not delete” for an additional cost.
- vi. For encryption of Backups at rest, the Customer has the option to leverage customer-managed encryption keys in lieu of the default cloud provider-managed encryption keys.
- vii. Using the Vantage Console, the Customer can perform both standard and optional Backup policies either online or offline. Snapshots are always performed offline.
 - a. Online backups contend for access for the objects being backed up and reduce available performance
 - b. Offline backups usually complete in a shorter timeframe but block write access to objects until the backup job is complete
- viii. Backups can be configured as Standard or Snapshot.
 - a. Standard Backups can be configured to full, full delta, partial and/or partial incremental.
 - Full and Full Delta Incremental. Full system (DBC All) standard backups can be executed either as Full or Full Delta Incremental jobs.
 - o A Full Standard Backup is a complete copy of the system data (DBC All).
 - o A Full Delta Incremental Standard Backup covers all the data that has changed since the previous full standard backup, regardless of type (i.e., Full vs. Full Delta Incremental).
 - Partial Full and Partial Delta Incremental. Partial system Standard Backups can be either a Partial Full or a Partial Delta Incremental backup job.
 - o A Partial Full backup includes a subset of the data (e.g., databases, tables, views, etc.) from the overall system. A Partial Full backup is a complete copy of the targeted subset of the data.
 - o A Partial Delta Incremental backup includes only the data in the partial backup that has changed since the previous partial backup job was run. The first time a Partial Delta Incremental backup job is performed, it will always be a full copy of the targeted subset of data—only the subsequent backup jobs will be performed as an incremental backup.
 - o Partial backups can be used to split up full system backups into multiple smaller jobs that run at different times.

- b. Snapshot Backups are always full-system and have a limited effect on system availability while in progress.
 - Snapshot Backups can be performed either on an ad-hoc basis or configured to run according to a pre-defined schedule
 - Incremental Snapshot Backups include only data that has changed since the previous Snapshot Backup was run.

- g) Backup Support
 - i. Standard Backup Jobs and Snapshot Backups will initiate a Case on job failure and will include the status as "Failed."
 - ii. Failure is defined as unable to complete a Backup to its end point.
 - iii. Standard Backup Jobs can complete with exceptions and warnings that are reported in the Vantage Console.
 - iv. Standard Backup Jobs completed with exceptions and/or warnings should not be considered as failed or unusable. To ensure Backup Jobs can complete within a reasonable timeframe, objects will be skipped (i.e., excluded) when multiple retries are unsuccessful or if the object is unavailable to backup. Those situations will be reported in the Vantage Console as an exception or warning. If a particular Backup Job continues to skip objects, the Customer should review the job schedule to see if the Backup Job can be rescheduled for a day/time when the affected object(s) will be available.
 - v. The Customer is responsible for monitoring the status of and configuring email alerts via the Vantage Console for all Backup Jobs, including exceptions and warnings. Customer can set email alerts for Backup Job start, failure, completed successfully, completed with exception(s), completed with warning(s), and/or schedule changes.
 - vi. The Customer is responsible for resolving exceptions and warnings.
 - vii. If needed, the Customer can submit a Case in the Support Portal to request more information about the exceptions or warnings.

- h) Restore Requests
 - i. Restores from a Snapshot Backup. The Customer may perform a self-service restore from the Vantage Console for Snapshot Backups. Snapshot Backups can only be used for full system restores to the point-in-time state from when the last Snapshot Backup was taken.
 - a. The configuration (e.g., instance type, size, and quantity; storage volume sizes; AMP configurations, etc.) of the VantageCloud system being used as a Snapshot Backup restoration target must match that of the source VantageCloud system from which that Snapshot Backup was taken. When the Snapshot Backup is restored, it will initiate a reset of the full VantageCloud system, including ecosystem server metadata, where appropriate.
 - b. Restores from Snapshot Backups will effectively overwrite existing system data with the last Snapshot Backup data. All data loaded / changed after the last Snapshot Backup was taken will be lost. This action is not reversible.
 - c. Partial Restores from a Snapshot Backup are not possible (e.g., table-level restore).

- ii. Restores from a Standard Backup. The Customer can request a restore to the same system (e.g., Analytics Database tables, databases, and full system-level data) via a Change Request under Standard Backups on the Vantage Console or the Support Portal.
 - a. For Restores from a Standard Backup requested from a Change Request:
 - Restore jobs are performed manually by Teradata as a one-time operation (i.e., for the requested tables and/or databases) at the date and time agreed upon in the Change Request.
 - The Customer can request up to two restores per month. The Customer must provide the following information in the Change Request:
 - Object type(s) and object name(s)
 - Standard Backup name and date (i.e., point-in-time)
 - Restore maintenance window (i.e., date and time the restore should be implemented)
 - Change Requests for Restores will be designated as “Normal” unless “Emergency” S1 situation requirements are met.
 - b. For all Restores from a Standard Backup:
 - A suitable Backup Job must be available to restore from the point-in-time that is requested.
 - Restores can only be applied to the same system from which the Backup Job was generated.
- i) Additional Customer Responsibilities and Terms
 - i. The Customer is responsible for scheduling, monitoring, and correcting conflicts (e.g., Data Integration (ETL), data loads, external queries, jobs/flows and queries).
 - ii. The Customer can trigger Backup Jobs remotely using available API calls. The Customer is solely responsible for the use of APIs, including creation of scripts, setup of 3rd party scheduling tools, and managing conflicts between API-triggered backups and BaaS-scheduled backup or snapshot activity.
 - iii. The Customer is responsible for Cron Jobs; these jobs are not supported by Teradata.
 - iv. The Customer must keep Teradata Query Service enabled to take advantage of self-service Standard Backup features.
 - v. The Customer is responsible for ensuring that an appropriate Full Backup exists—either with a Snapshot Backup or with a full Standard Backup— to meet the customer’s desired recovery point objective. The Customer can schedule the Full Backup either during System Provisioning or via the Vantage Console. These Backups will be used by Teradata to restore data and VantageCloud services in case of a system outage or hardware / software / OS induced data corruption that has rendered the database unusable and requires full data restoration. Note that full system restores are performed only when needed to recover from a system outage or data loss/corruption event.
 - vi. Any deviation from the Default Backup Lifecycle Policy (e.g., splitting a Full Backup Job into multiple partial Backup Jobs) requires implementation by Teradata Consulting for an additional fee.
 - vii. Scheduling concurrent or overlapping Backup Jobs should be avoided due to possible performance degradation or prolonged job completion times.
 - viii. Teradata is not liable for failed restores if the Customer has not retained a suitable Full Backup.

9. Compute and Storage Pricing Options

Compute and Storage Pricing Options are available as described in the Cloud Service Description Addendum for the specific cloud platform.

10. VantageCloud Security

VantageCloud Security includes the following features: Security Standards; Additional Audits or Reviews; Access Control; Security Re-Approval Process; Encryption; Secure Authentication; User Roles; Monitoring; and Vulnerability Management.

10.1 Security Standards. Teradata uses independent, industry-recognized auditors to annually audit the VantageCloud service for compliance with the following standards:

- a) Health Insurance Portability and Accountability Act (HIPAA)
- b) International Standards Organization (ISO/IEC27001)
- c) Payment Card Industry Data Security Standard (PCI DSS)
- d) Service Organization Controls reports (SOC1, SOC2, Type 2)

10.2 Additional Audits or Reviews. Any audits or reviews other than those listed in Section 9.1 will only be allowed if expressly permitted in the Teradata Master Cloud Service Agreement.

10.3 Access Control

- a) The Customer controls access to their Customer Data. Teradata treats all Customer Data as private and will only access it with specific permission from the Customer.
- b) As part of its Access Protection Policy, Teradata requires its personnel to complete training and to sign security agreements before receiving system access.
- c) Teradata enforces password complexity, stores, and transmits only encrypted password representations, and sets minimum and maximum lifetime restrictions on passwords. Teradata cannot view Customer Data without the Customer granting access—and Teradata never transfers Customer Data between countries unless instructed to do so by the Customer.

10.4 Security Re-Approval Process. Re-approval is a standard security operation to ensure that credentials and access rights are reviewed regularly. Teradata establishes a security re-approval process for Teradata personnel that consists of:

- a) All access from remote devices to the cloud environment is managed via VPN and Multi-Factor Authentication (MFA). Teradata logs all access to systems and sends the logs to a central server where they are protected from tampering. The logs are also correlated and analyzed.
- b) Reviewing and approving account management actions
- c) Monitoring account management operations for unauthorized actions
- d) Disabling inactive accounts after 90 days
- e) Disabling VantageCloud accounts after a Teradata user is transferred or terminated
- f) Modifying role-based access when a Teradata user's system usage or need-to-know requirements change

10.5 Encryption

- a) Teradata gives the Customer options for encrypting data-in-transit and data-at-rest. When enabled, data is encrypted in transit between Teradata and connecting client sessions. Data is also secure from public exposure as it traverses network segments in the Cloud Service Provider's infrastructure by implementing customer-selected connectivity options. Data-at-rest is stored in encrypted volumes in the Cloud Service Provider's storage.
- b) Enhanced encryption solutions are also available from Teradata's third-party partners. Additional information is provided in the Cloud Service Description Addendum.

10.6 Secure Authentication. Teradata recommends the use of Federated Authentication / Single Sign-on (SSO) and can also provide optional support for Lightweight Directory Access Protocol (LDAP) as an authentication method. Teradata Database Authentication (TD2) is provided as a default database authentication method.

- a) Federated Authentication/SSO: Teradata supports Federated Authentication/SSO. This capability is specific to customers that have an identity provider (IdP), enables VantageCloud users to log on to the VantageCloud system and supported applications with a single set of their corporate credentials and enables them to move seamlessly between applications. These applications include Teradata Studio, Viewpoint, and certain third-party applications. The Customer Identity Provider can be integrated via the Vantage Console. This Federated Authentication/SSO offers the following features:
 - i. Bring Your Own IdP (BYOIDP) - Customers can bring their own IdP to integrate with the VantageCloud native IdP. In this digital authentication approach, user identity is managed by the Customer's IdP.
 - ii. Bring Your Own Multi-Factor Authentication (BYOMFA) - VantageCloud customer business users enrolled in MFA with their IdP can engage in that multi-level authentication flow.
 - iii. Bring Your Own Third-Party Tool (BYOTT) - Customers can bring their own third-party Business Intelligence (BI) tools and participate in a secure single sign-on experience.
 - iv. Federated Authentication/SSO on VantageCloud supports both SAML and OpenID Connect (OIDC) protocols. SAML is an XML-based open-standard for exchanging authentication and authorization data between applications. OIDC uses JSON Web Tokens (JWT) obtained through a standard OAuth 2.0 flow.
- b) Teradata Database Authentication (TD2). Teradata provides the TD2 mechanism as a default for Teradata database authentication.
- c) Lightweight Directory Access Protocol (LDAP). VantageCloud supports LDAP directory services integration over SSL/TLS (LDAPS). VantageCloud secure LDAP directory services integration for secure authentication is available by Teradata Consulting for an additional fee.
- d) Kerberos. Teradata supports Kerberos single sign-on (SSO) secure user authentication between Customer domain users and a VantageCloud system where the Customer external directory service is designated as the Kerberos Key Distribution Center (KDC). This option does not require network connectivity between VantageCloud and the customer's external directory service.

10.7 User Roles. Designated users receive user IDs from Teradata with permission to access VantageCloud and its stored data. User types DBC (superuser), SYSDBA (VantageCloud management), and SECADM (security administration) receive TD2 authentication and default passwords, which the Customer is responsible for changing after the first use.

- 10.8 Monitoring. The VantageCloud security monitoring process collects and correlates relevant security policy events. VantageCloud systems are configured to log events such as failed login attempts, account creation, account removal, system policy changes, privileged access, IPS, etc. The logs are sent to the Security Information and Event Management system (SIEM), correlated and analyzed in real time.
- a) The SIEM database containing system logs is stored in a secure and tamper-proof area. Other events are audited, as appropriate, to monitor security-critical functions, respond to new threats, and to investigate potential security incidents.
 - b) Customers are responsible for performing scans on their own underlying infrastructure, applications, and database content.
- 10.9 Vulnerability Management. Teradata performs regular scans of the environment and code to identify and remediate vulnerabilities in the software and operating systems. This is performed through a combination of static application security analysis and both network and application-level vulnerability assessments.

11. Pre-General Availability Offerings

Teradata may make available, and the Customer may choose to use, pre-general availability features for VantageCloud that are identified as “Limited Availability,” “Early Access,” “Preview,” “Alpha,” “Beta,” or a similar designation in related documentation or materials. Pre-General Availability offerings are not necessarily feature-complete, nor do they necessarily have technical support commitments. Unless otherwise stated by Teradata, Pre-General Availability features are intended for use in test environments only and should not be used to process personally identifiable data or data subject to legal or regulatory compliance requirements. Customers may provide feedback and suggestions to Teradata about pre-general availability offerings, and Teradata and its affiliates may use any feedback or suggestions provided without restriction and without obligation to the Customer. Pre-General Availability offerings may be changed, suspended, or discontinued at any time without prior notice to the Customer and are not covered by any Service Level Agreement.

12. Additional Services (Sold Separately)

Teradata has a wide variety of additional services for VantageCloud Customer needs, including:

- 12.1 Essential Success Service builds upon the features of Premier Cloud Support with account management and proactive services to support platform availability, case prevention, and platform enablement.
- a) Essential Success Service is included for Analytics Database instances with greater than 70 TCores or 367,000 TCore-Hours.
 - b) Essential Success Service is included with the Vantage Units Consumption Pricing model.
 - c) Essential Features
 - i. Customer Support Plan
 - ii. Assigned Service Management
 - iii. Service Reviews
 - iv. Viewpoint Configuration
 - v. PDCR Configuration
 - vi. Teradata Education Checkbook
 - d) Customer Support Plan. Teradata documents ongoing customer support processes (including roles and responsibilities) in a support plan that Teradata reviews with the customer annually and updates as necessary.

- e) Assigned Service Management
 - i. Teradata identifies technical resources to lead, direct, and facilitate customer service deliverables.
 - ii. The Customer Support Plan specifies individuals by name, provides direct contact information, and identifies their specific roles and responsibilities in delivering services.
 - iii. For each Severity 1 Case, a Teradata representative conducts a "post-case" analysis that includes a closed loop corrective action plan. Teradata informs the customer of any changes in the product support policy permitted by, and in accordance with, this document, any order, or the agreement.
- f) Service Reviews. Teradata conducts quarterly service performance reviews with the customer. On an annual basis, Teradata reviews the customer service offer to assess service coverage, determine how current services will satisfy any planned platform enhancements, and discuss future opportunities for developing the customer's relationship with Teradata. Reviews are conducted either on site or by telephone at Teradata discretion. The Service Reviews will focus on the following service reports:
 - i. Availability Management Report: Teradata provides a method of measuring, monitoring, and reporting platform availability via the Support Portal. Availability reports identify outages and durations, analyze the cause, and recommend changes to improve availability.
 - ii. State of Health Report: Teradata performs remote platform health checks to identify potential problem areas where errors have not reached platform-defined thresholds and are currently recoverable. The health check tool compares customer data to associated thresholds and generates a report via the Support Portal that a Teradata support analyst uses to recommend how to resolve any issues during the customer next planned maintenance window.
 - iii. Service Performance Report: Teradata provides a service performance report via the Support Portal that identifies Teradata response time to all Cases submitted to a Teradata Service Center during the quarterly reporting period. Service performance reports for dual active systems (including the platform health check, TPS compliance, and service performance reports) are platform-specific; therefore, in dual active implementations, customers receive two individual platform versions of these reports.
- g) Viewpoint Configuration. On an annual basis, Teradata reviews and, if necessary, updates Teradata Viewpoint to verify that notifications and workload parameters are properly configured for the customer analytical ecosystem.
- h) PDCR Configuration. On an annual basis, Teradata reviews and, if necessary, updates the Performance Data Collection Reporting (PDCR) tool and database. PDCR helps customers leverage historic platform and query performance for more informed database management and consumption decisions.
- i) Teradata Education Checkbook
 - i. Teradata provides one standard Education checkbook allowance per customer with a VantageCloud subscription. The checkbook can be used solely toward Teradata University subscriptions, web-based courses, public virtual instructor-led classes, or Teradata Certification exam vouchers.
 - ii. The checkbook allowance must be used during the initial VantageCloud Enterprise Service Term. Teradata may provide additional checkbook allowances for renewal terms.
 - iii. Cancelling or rescheduling of training with less than 10 business days' notice will result in a full charge for such training, including any instructor travel expenses.

- 12.2 Optimize Success Service builds upon the Essential Success Services offering to engage additional tools, processes, and resources that are designed to improve the operation of the analytical ecosystem.
- 12.3 Backup Service Options refer to anything above and beyond the standard backup service listed above.
- 12.4 Performance Service Options not listed in the Cloud Service Description are available for Workload Management, Application Performance, Performance Data Analytics, and Capacity Management.
- 12.5 Database Administration and Operations Managed Services provides administration, operations, and production services for the Customer's Cloud ecosystem
- 12.6 Migration Service Options assist the Customer during the migration to VantageCloud, including Data Migration, Viewpoint Migration, Query Grid Migration, LDAP Migration.

Teradata VantageCloud Enterprise Google Cloud Addendum

This document supplements the Teradata VantageCloud Enterprise Cloud Service Description.

November 11, 2022

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1. Teradata VantageCloud Enterprise on Google Cloud

Deploying VantageCloud Enterprise on Google Cloud establishes a Vantage environment in a Teradata-owned Google Cloud project.

Teradata provisions, configures, and provides customer access to a Google Cloud project in a supported region. This document supplements the Teradata VantageCloud Enterprise Cloud Service Description. Customers can often subscribe to a VantageCloud environment in the same Google Cloud region as their data.

2. Compute Pricing Options

Pricing for VantageCloud is available in four options: Fixed Capacity, Flexible Capacity, Elastic Performance on Demand (EPOD), and Consumption. Each VantageCloud system can support only one pricing option.

2.1 Blended Pricing models refer to Fixed Capacity, Flexible Capacity, and Elastic Performance on Demand pricing constructs as indicated below.

- a) Fixed Capacity consists of a fixed baseline TCore purchased for the Cloud Service Term along with the option to obtain additional capacity for a variable term.
 - i. Fixed Capacity Baseline is measured in TCores. The Customer must order a fixed amount of compute capacity for the full Cloud Service Term and cannot reduce capacity below this level.
 - ii. Adjustable Capacity refers to additional CPU, memory, and I/O that can be added or removed on demand by using VantageCloud elasticity features during the Cloud Service Term (see table in Section 4 below). This additional capacity is billed in On Demand TCore-Hours monthly in arrears and are a function of: a) the number, type, and size of the provisioned Analytics Database compute instances; b) their respective TCore ratings; and c) the number of full or partial hours that the adjusted Analytics Database compute instances are provisioned. The computation of On Demand TCore-Hours also accounts for the Fixed Capacity Baseline ordered.
- b) Flexible Capacity allows the Customer to vary the compute capacity of the instance during the Cloud Service Term. Flexible Capacity is measured in both Committed TCore-Hours and On Demand TCore-Hours.
 - i. Committed TCore-Hours are purchased at the beginning of each contract year in the Cloud Service Term and consumed over that contract year. Unused TCore-Hours expire at the end of each contract year and do not roll over. If/when Committed TCore-Hours are fully consumed during a contract year, Flexible Capacity is then billed at the On Demand TCore-Hourly rate. Flexible Capacity has a minimum annual commitment of 25,000 Committed TCore-Hours per Analytics Database instance. The rate of TCore-Hours drawn down from this annual commitment depends upon: a) the number, type, and size of the provisioned Analytics Database compute instances; b) their respective TCore ratings; and c) the number of full or partial hours that the Analytics Database compute instances are provisioned.
 - ii. On Demand TCore-Hours are billed monthly in arrears and reflect: a) the number, type, and size of the provisioned Analytics Database compute instances; b) their respective TCore ratings; and c) the number of full or partial hours that the Analytics Database compute instances are provisioned.
 - iii. The VantageCloud elasticity features (see table in Section 4 below) can be used to add and remove compute capacity of a VantageCloud instance as needed to meet workload requirements.

- c) Elastic Performance on Demand (EPOD) refers to when Teradata provisions additional fixed compute capacity in the instance. The Customer starts by purchasing Committed EPOD TCore-Hours. When the Customer's processing uses the additional compute capacity in the instance, that usage consumes the EPOD TCore-Hours—first from any Committed EPOD TCore-Hours and then from On Demand TCore-Hours.
 - i. Fixed Capacity Baseline is measured in TCores. The Customer must order a fixed amount of compute capacity for the full Cloud Service Term and cannot reduce capacity below this level.
 - ii. Committed EPOD TCore-Hours are purchased at the beginning of each contract year in the Cloud Service Term and are consumed over that contract year. Unused EPOD TCore-Hours expire at the end of each contract year and do not roll over. If/when Committed EPOD TCore-Hours are fully consumed during a contract year, EPOD usage is then billed at the On Demand EPOD TCore-Hourly rate. EPOD is subject to a minimum annual purchase quantity of EPOD TCore-Hours based on the provisioned additional fixed compute capacity.
 - iii. On Demand EPOD TCore-Hours usage is billed at the On Demand EPOD TCore-Hourly rate if/when Committed EPOD TCore-Hours are fully consumed during a contract year. On Demand EPOD TCore-Hours are billed monthly in arrears.
 - iv. EPOD TCore-Hour Usage is measured by Teradata during each month of the Cloud Service Term by running a standard report that sums up both the time that the compute instance was processing and the TCore rating of each Analytics Database instance. That total is converted to TCore-Hours. Then, the Fixed Capacity Baseline TCore that the Customer purchased is deducted from the total. The remainder is the TCore-Hours used in that month.
- 2.2 Consumption Pricing for VantageCloud Enterprise allows the Customer to pay only for the compute resources used and is measured in Vantage Units. Vantage Units are available as part of a pre-purchase commitment and/or based upon on-demand use.
- a) Types of Vantage Units.
 - i. Committed Vantage Units are pre-purchased and consumed based on actual use over each contract year of the VantageCloud subscription. Unused Committed Vantage Units expire at the end of each contract year and do not roll over. If/when pre-purchased Committed Vantage Units are fully consumed during a contract year, overages are billed using On Demand Vantage Units.
 - ii. On Demand Vantage Units are billed in arrears monthly based on actual use.
 - b) Consumption Pricing is available for supported deployment options only. Teradata measures compute consumption using Vantage Units. The pricing model for compute system resources is set out in this Section; the pricing model for storage and related fees is set out elsewhere in this Addendum.
 - c) Teradata measures Vantage Units by summing the compute resources a system uses. The measurement of Vantage Unit usage begins immediately after system provisioning. Vantage Units are consumed by the logical I/O data used by the instance, excluding the uses set out in Excluded from Vantage Units.

- i. Included in Vantage Units. All logical I/O, except I/O from the activities described in subsection (ii) below, are included when calculating Vantage Units. The following activities are examples of some of the queries and functions included:
 - a. All Analytics Database queries
 - b. Viewpoint and system monitoring activities including the following:
 - Viewpoint usage via the user interface
 - Viewpoint data collector activity (See the Teradata Viewpoint User Guide for more information about data collectors.)
 - Statistics collected via SQL by statsuser in the Stats Manager
 - c. Utility-based load jobs
 - d. Backup / restore / data migration
 - Backups
 - Restores, including post-restore SQL scripts
 - Data migration (for example, Data Transfer Utility)
 - ii. Excluded from Vantage Units. Logical I/O created by the following functions are excluded from the calculation of Vantage Units:
 - a. Consumption collector queries by the consumption service (i.e., vcmuser) and activities by system users
 - b. Movement of usage data from DBC/DBQL to PDCR
 - c. SQL usage by PDCR Admin in the Performance Data Collection portlet
 - d. User-initiated queries that are aborted due to a processing error and return a database error code
- d) Purchase Consumption refers to when the Customer purchases Consumption for VantageCloud Enterprise through either a commitment or an on-demand subscription as shown in the Purchase Consumption table below.

Purchase Consumption		
Vantage Units	Commitment	On-Demand
Description	Pre-purchase a certain amount of compute that the Customer organization consumes during the subscription term.	Purchase compute as you use it
Subscription	Annual or 3-year terms are required for Consumption for VantageCloud Enterprise.	Pay-as-you-go: Any usage outside of a commitment or when all of the committed Vantage Units have been consumed in a contract year will be billed at on-demand rates.
Payment	<ul style="list-style-type: none"> • Pre-paid annually for a defined quantity of Vantage Units • Customer can purchase additional Vantage Units for the remainder of the annual term, if needed, or continue usage at the on-demand rates. 	Paid monthly, in arrears, based on actual compute usage

- e) Purchase Storage. Summary of Storage and related fees for Consumption Pricing are shown in the Purchase Storage table below.

Purchase Storage		
Storage	Commitment	On-Demand
Data Store	Pre-purchase Customer Data Space (CDS). Additional storage capacity available for committed purchase.	
Standard Backup Storage	Pre-purchase of storage to persist Standard Backups is available	
Snapshot Backup Storage	Storage to persist snapshot-based backups is available	

f) Monitor Consumption

- i. Teradata collects and stores usage data to monitor, evaluate, and report system status and performance. Teradata uses this data to determine how you use our software, access functions, and perform analytics. Teradata does not collect any sensitive or personally identifiable data, nor any data values you enter into your VantageCloud system.
- ii. Customer can enable log features during onboarding to monitor Teradata processing activities.
- iii. To monitor system consumption, Teradata requires continuous access to Customer system compute resources. If Customer does not grant this level of access or if it is turned off, Customer will owe the full amount of the deployed system at the maximum Vantage Unit capacity available for the entire month. If access is not reinstated before the start of the next month, Teradata reserves the right to terminate the service.
- iv. Database Query Log (DBQL) and Performance Data Collection Reporting (PDCR) Log
 - a. The customer must not move data from dbc.Dbqltgtbl, dbc.ResUsageSpma, or dbc.dbqlutilitytbl.
 - b. Configured Viewpoint jobs move data from dbc.Dbqltgtbl, dbc.ResUsageSpma, and dbc.dbqlutilitytbl to the PDCR log.
 - c. Teradata maintains a minimum of three months of data in the PDCR log.
 - d. If there is a shortage of space in the PDCR log, Teradata will increase the space to accommodate the new logs.
 - e. Teradata sets SQL, Utilityinfo, and FUL DBQL logging for all the users. The customer must not change it.
 - f. Teradata disables Summary and Threshold logging.
- v. VCMUSER requires access to several views, tables, macros, and stored procedures to perform Vantage Unit collection activities.

3. Storage Pricing Options

Storage pricing options for VantageCloud Enterprise on Google Cloud are for Data Store and Backup.

- 3.1 Data Store Storage. Data Store is sold as Customer Data Space (CDS). VantageCloud Data Store can be expanded later through VantageCloud elasticity features (see table in Section 4 below).
- 3.2 Backup Storage. Backup Storage is sold as storage capacity consumed based on the maximum storage capacity utilized at any point during each calendar month (the Backup Storage “high-water mark”). If required, additional Backup Storage should be estimated and purchased in advance. Increasing retention and adding backup jobs increases storage use and incurs additional costs.
 - a) Standard Backup Storage. Standard Backup Storage is a required purchase to store Standard Backups.
 - b) Snapshot Backup Storage. Snapshot Backup Storage is a required purchase to store Snapshot Backups.

4. Subscription Features

The Cloud Service Description describes many of the features specified in this Cloud Service Description Google Cloud Addendum, as shown in the Subscription Features table below.

Subscription Features	
Features	Descriptions
System Features (Included)	
Availability	<p>24 x 7 availability service-level agreement (SLA of 99.9%) for the Analytics Database, measured and tracked monthly</p> <p>Note: The availability SLA of 99.9% is not applicable to a disaster recovery event where the cloud provider availability zone or region is impacted. If VantageCloud is deployed in a cloud provider region that has multiple availability zones, Teradata will use reasonable efforts to deploy a new system in a secondary, unimpacted availability zone and restore from an existing backup to the secondary, unimpacted availability zone as part of our service.</p>
Onboarding Services	System provisioning and validation
System Monitoring	Infrastructure and operating system monitoring
System Maintenance	Software patches and version upgrades
System Backups	<ul style="list-style-type: none"> • Default Backup Lifecycle Policy is zero full system Standard Backups and zero copies retained. Customers have the option of scheduling Standard Backups to be executed by Teradata daily, weekly, or monthly. Standard Backup storage must be purchased to support Standard Backups and to retain additional copies as needed. • Snapshot Backups storage must be purchased as needed to support the required snapshot frequency and retention policy. • Custom backup services (such as copying backups to multiple availability zones or regions for disaster recovery purposes) are purchased separately through Teradata Consulting and/or Teradata Services. <p>Note: Teradata backs up VantageCloud instances only as directed by the customer.</p>

Subscription Features	
Features	Descriptions
Encryption	<ul style="list-style-type: none"> • <u>Data in Transit</u> Teradata provides customers with choices for encryption of data at rest and in transit. When enabled, data is encrypted in transit between Teradata and connected client sessions. • <u>Data at Rest</u> <ul style="list-style-type: none"> ○ Google-managed Encryption Keys. By default, VantageCloud leverages Google-managed encryption keys for encryption of VantageCloud Data Store data at rest. ○ Customer Managed Encryption Keys (CMEK). (Limited Availability feature) Customers may, optionally, and where available, leverage Customer Managed Encryption Keys to manage encryption keys themselves. Customers can independently revoke Teradata's access to their CMEK-protected data if desired. <ul style="list-style-type: none"> ▪ CMEK support extends only to VantageCloud Data Store and Snapshot Backups (Limited Availability feature) ▪ Customers are responsible for creation, rotation, and maintenance of their CMEK key(s)/keychain(s) using Google Cloud KMS ▪ CMEK keys can be rotated by the customer using either manual or automated means via Google Cloud KMS ▪ Customers cannot switch between software and hardware protected keys without reprovisioning of the VantageCloud system ▪ CMEK can only be enabled at system provisioning time ▪ Revoking Teradata's access to the CMEK key(s)/keychain(s) will cause VantageCloud to cease operations and may result in data integrity issues, corruption, and/or complete and unrecoverable loss of customer data. ▪ Deletion of the CMEK key(s)/keychain(s) will result in complete and unrecoverable loss of customer data. ▪ If Teradata's CMEK key access is lost, Teradata uses reasonable efforts to resolve any concerns with the customer and return the VantageCloud system to service ○ Third-party Applications. As an enhanced security option, database administrators can leverage third-party partner software (sold separately) to encrypt and control access to individual rows and columns within VantageCloud
Mainframe Connectivity	TCP/IP-based Mainframe Connectivity. (Limited Availability feature) Customers may, optionally, and where available, leverage TCP/IP-based Mainframe Connectivity to a customer's on-premises Mainframe system for non-production use cases and non-production workloads only.

Subscription Features	
Features	Descriptions
Elasticity Features (Available for Blended Pricing Only)	
VantageCloud Stop/Start	<p>Stop and restart VantageCloud instances without affecting persistent storage (subject to the cloud infrastructure availability). Stop/Start will pause/resume the rate of TCore-Hour consumption when the VantageCloud instance is stopped/restarted.</p> <p>Note: Available for Flexible Capacity pricing only.</p> <p>Note: Queries that are running when the VantageCloud instance is stopped are not automatically resumed and must be restarted after the VantageCloud instance is restarted.</p> <p>Note: VantageCloud Stop/Start alters the runtime state of Analytics Database only and does not extend to other components and services (and any associated fees such as Applications, backups, network egress, etc.)</p>
VantageCloud Scale Out/In	<p>Change number of Analytics Database node instances within an instance series without affecting persistent storage (subject to the cloud infrastructure availability). Scale Out/In will increase/decrease the rate of Tcore-Hour consumption based on the number and size of the instances being added or removed to the VantageCloud system.</p> <p>Note: Available for Fixed Capacity and Flexible Capacity pricing options only.</p> <p>Note: Scale Out/In operations result in the VantageCloud instances being restarted during which time customers cannot submit queries and any running queries will need to be restarted.</p>
VantageCloud Scale Up/Down	<p>Change Analytics Database node instance sizes within an instance series without affecting persistent storage (subject to the cloud infrastructure availability). Scale Up/Down will increase/decrease the rate of Tcore-Hour consumption</p> <p>Note: Available for Fixed Capacity and Flexible Capacity pricing options only.</p> <p>Note: Scale Up/Down operations result in the VantageCloud instances being restarted during which time customers cannot submit queries and any running queries will need to be restarted.</p>
Elastic Performance on Demand (EPOD)	<p>Add additional VantageCloud compute capacity without any downtime. EPOD capacity up to the baseline VantageCloud system size is possible.</p> <p>Note: Available for the EPOD pricing option only.</p>
Elasticity Features (Available for all available Pricing Options)	
Data Store Expansion	<p>Expand storage after deployment</p> <p>Note: Data Store Expansion operations result in the VantageCloud system being restarted during which time customers cannot submit queries and any running queries will need to be restarted.</p> <p>Note: Data Store Expansion is a one-way operation. Once increased, storage capacity cannot be reduced.</p>
Self-Service Interfaces (Included)	
Service Portal	Submit incidents and other requests
Vantage Console	Monitor and manage systems, users, and tickets
Additional Fees (Required)	
Data Transfer	Network egress from the VantageCloud Enterprise on Google Cloud environment

Subscription Features	
Features	Descriptions
Additional Fees (Optional)	
Additional TCore-Hours	Additional TCore available on demand (Blended Pricing option required)
Additional Vantage Units	Additional Vantage Units available on demand (Consumption Pricing option required)
Additional Data Store Customer Data Space (CDS)	Additional storage capacity is available
Standard Backup storage	Storage to persist Standard Backups is required
Snapshot Backup storage	Storage to persist Snapshot Backups is required
Teradata Success Services	Proactive operational support and service management
Priority Service	Increased incident support coverage hours and accelerated response times

5. Applications

This section describes various applications, including packaging options, that are either included with the VantageCloud subscription or that are sold separately.

5.1 Application Packaging Options are summarized in the Application Packaging Options Summary table below.

Applications Packaging Options Summary		
Packages	Availability	Details
Cloud Foundation	Included.	Included with VantageCloud subscription.
Teradata IntelliSphere	Sold separately.	Teradata software license bundle providing software entitlement for several Teradata applications. Requires additional purchase of IntelliSphere Foundation for application deployment.
Teradata IntelliSphere Foundation	Sold separately.	Teradata application enablement package for Teradata IntelliSphere. Requires purchase of Teradata IntelliSphere software license bundle.
A-la-Carte Teradata Applications	Sold separately.	Alternative purchase option for Teradata applications on an individual application-by-application basis.
Third-Party Tools	Sold separately.	Customers may bring their own license for approved third-party partner tools (BYOL) that reside within the VantageCloud Enterprise on Google Cloud environment. Subject to an additional third-party software hosting fee.

5.2 Cloud Foundation (Included). Cloud Foundation bundles the foundational applications included with the VantageCloud subscription, as shown in the Cloud Foundation Applications table below.

Cloud Foundation Applications	
Applications	Details
Teradata Analytics Database	Included with VantageCloud subscription.
Teradata Data Mover	<ul style="list-style-type: none"> One standard-size instance included with VantageCloud subscription. Requires implementation by Teradata Consulting for an additional fee. VantageCloud Enterprise on Google Cloud must be used as either a source or target.
Teradata Query Service	Included with VantageCloud subscription.
Teradata Viewpoint	<ul style="list-style-type: none"> One standard-size instance included with VantageCloud subscription. Teradata Viewpoint supports monitoring and management of the VantageCloud system that is part of the VantageCloud subscription (single system use only is supported).

5.3 IntelliSphere (Sold Separately). For an additional fee, Teradata® IntelliSphere™ provides the functions of ingest, access, manage, and deploy with the following applications for use in VantageCloud, as shown in the Teradata IntelliSphere table below. Customers must purchase additional infrastructure to deploy and implement IntelliSphere software. The IntelliSphere software license, infrastructure, and implementation services are each sold separately.

IntelliSphere Applications Availability	
Applications	Availability
Teradata Data Lab	Software entitlement included
Teradata Data Mover	<ul style="list-style-type: none"> Software entitlement included Requires implementation by Teradata Consulting for an additional fee VantageCloud Enterprise on Google Cloud must be used as either a source or target.
Teradata QueryGrid	<ul style="list-style-type: none"> Software entitlement included Requires implementation by Teradata Consulting for an additional fee <p><i>Note: Teradata QueryGrid software entitlements for the Teradata Connector are included with Consumption Pricing for VantageCloud.</i></p>
Teradata Viewpoint	Software entitlement included (for use with enhanced-size Viewpoint)

5.4 IntelliSphere Foundation (Sold Separately). For an additional fee, Teradata® IntelliSphere™ Foundation provides deployment entitlement to the applications and their quantities for use in VantageCloud, as shown in the Teradata IntelliSphere Foundation table below. IntelliSphere Foundation is required with the purchase of IntelliSphere.

IntelliSphere Foundation	
Application	Availability
Teradata Data Lab	One per VantageCloud system
Teradata Data Mover - Standard Size	<ul style="list-style-type: none"> Up to three instances total of any combination. Additional instances sold separately.
Teradata QueryGrid Manager	
Teradata QueryGrid Oracle Driver	
Teradata Viewpoint - Enhanced Size	

5.5 A-la-Carte Teradata Applications (Sold Separately). For an additional fee, Teradata applications may be purchased individually, as shown in the A-la-Carte Teradata Applications table below.

A-la-Carte Teradata Applications	
Applications	Availability
Teradata Data Lab	One per VantageCloud system (serves the entire VantageCloud system)
Teradata Data Mover	<ul style="list-style-type: none"> One instance. Up to a total of four Data Mover instances may be purchased per VantageCloud system. All Data Mover instances must be of the same size. Requires implementation by Teradata Consulting for an additional fee. VantageCloud Enterprise on Google Cloud must be used as either a source or target. <p>Note: The first standard-size instance is included with Cloud Foundation.</p>
Teradata QueryGrid	<ul style="list-style-type: none"> Teradata Connectors for one VantageCloud system. Includes one instance of Teradata QueryGrid Manager per VantageCloud system. Requires implementation by Teradata Consulting for an additional fee. <p>Note: Teradata QueryGrid software entitlements for the Teradata Connector are included with Consumption Pricing for VantageCloud.</p> <p>Note: Infrastructure costs for one QueryGrid VM are included with consumption pricing for the consumption pricing-based system. The customer may use the QueryGrid Manager provided under this offering or may use an existing one residing in the cloud based on the customer's needs.</p>
Teradata Viewpoint	<ul style="list-style-type: none"> One enhanced-size Viewpoint instance. A maximum of one Viewpoint instance is supported per VantageCloud system (regardless of size). <p>Note: The first standard-size instance is included with Cloud Foundation.</p>

5.6 Third-Party Tools Descriptions (Sold Separately). For an additional fee, called the VantageCloud Third-Party Software Hosting Fee, Teradata will host approved and licensed third-party software as described in this section and in the Third-Party Tools Descriptions table below.

- a) Third-Party Tools are available only through a bring-your-own-license (BYOL) model where the customer is required to enter into a separate agreement directly with the third-party vendor to license, maintain, and support the Third-Party Tool for the duration of the customer's VantageCloud subscription.
- b) Customers are responsible for engaging the Third-Party Tool vendor for software maintenance and support. Teradata agrees to perform activities that are necessary for such maintenance and support of the Third-Party Tool software in a VantageCloud environment that require infrastructure or node-level access, but only as specifically described and directed by the customer.
- c) Service Availability. SLA commitments do not apply to the extent that Teradata reasonably determines a failure was caused by the Third-Party Tool software.
- d) Customers are responsible for managing their own Third-Party Tool configurations, including application policies, passwords, and encryption keys.
- e) Implementing one or more of the below mentioned third-party encryption tools might result in an overall performance impact on the VantageCloud system.

Third-Party Tools Descriptions	
Third-Party Tools	Descriptions
Protegrity	<p><u>Protegrity</u> develops enterprise data security software and provides scalable, end-to-end data security solutions. Protegrity Data Security Platform helps Teradata customers secure sensitive data and comply with privacy regulations. Protegrity includes two components that pertain to VantageCloud:</p> <ul style="list-style-type: none"> • <u>Protegrity Database Protector for Teradata</u>: Provides policy-based data encryption and tokenization capabilities for Analytics Database. • <u>Protegrity Enterprise Security Administrator (ESA)</u>: Provides customers with centralized, visual administration of data security policies, key management, auditing, and reporting. Protegrity ESA must be installed, hosted, and managed by the customer, outside of the VantageCloud environment managed by Teradata. <p>Note: Customers must contract with Teradata Consulting to assist with implementation for an additional fee.</p>
Thales CipherTrust Protection for Teradata (CPT)	<p><u>Thales</u> develops enterprise data security software and provides scalable, end-to-end data security solutions. Thales CipherTrust Protection for Teradata helps Teradata customers secure sensitive data and comply with privacy regulations. CipherTrust Protection for Teradata includes two components that pertain to VantageCloud:</p> <ul style="list-style-type: none"> • <u>CipherTrust Protection for Teradata</u>: Provides encryption and decryption controls for securing sensitive columns in Analytics Database. • <u>CipherTrust Manager</u>: Provides customers with centralized administration of data security policies, key management, auditing, and reporting. CipherTrust Manager must be installed, hosted, and managed by the customer outside of the VantageCloud environment managed by Teradata. <p>Note: Customers must contract with Teradata Consulting to assist with implementation for an additional fee.</p>

Third-Party Tools Descriptions	
Third-Party Tools	Descriptions
Imperva SecureSphere	<p><u>Imperva SecureSphere</u> for database is a database activity monitoring (DAM) solution that provides real-time database protection and security. It helps Teradata customers monitor and audit access to all sensitive data and helps customers to satisfy compliance requirements. Imperva DAM reads database traffic from VantageCloud Analytics Database for monitoring, auditing, reporting, and alerting customers. Imperva integrates with Teradata using an on-node agent installation that communicates to a management, rule-based command, and control console known as Imperva SecureSphere Management Server. Imperva SecureSphere Management Server must be installed, hosted, and managed by the customer, outside of the VantageCloud environment managed by Teradata.</p> <p>Note: Customers must contract with Teradata Consulting to assist with implementation for an additional fee.</p>
IBM Guardium	<p><u>Guardium</u> is a data protection and network monitoring tool from IBM. It provides a database activity monitoring system (DAM), which reads network traffic from the database for collection, aggregation, monitoring, reporting, and alerting on user activity on the integrated database. Guardium integrates with VantageCloud using an agentless “Guardium Exit Library” configuration that communicates to a rule-based management command and control console that is hosted and managed by the customer, outside of the Teradata-managed VantageCloud environment. S-TAP/K-TAP integrations are not supported. Guardium Exit Library is the supported integration.</p> <p>Note: Customers must contract with Teradata Consulting to assist with implementation for an additional fee.</p>
SAS Embedded Process (SAS EP)	<p><u>SAS</u> develops and markets a suite of analytics software, which helps access, manage, analyze and report on data to aid in decision-making. SAS Embedded Process helps bring to Teradata customers advanced analytics capabilities through SAS code in Teradata VantageCloud without moving data out of VantageCloud.</p> <p><u>SAS EP</u> includes two components that pertain to VantageCloud:</p> <ul style="list-style-type: none"> • <u>SAS User-Defined Function (UDF) Server</u> components: Includes SAS EP, SAS EP Support Functions, and the SAS Formats library. Installing or upgrading SAS EP is independent of VantageCloud. However, if these components are required. Teradata will install SAS UDF Server components for an additional fee. • <u>SAS client-side software</u>: Provides an interface that customers can use to initiate function calls and analyze the results.

6. Supported Google Cloud Connectivity Options

Connectivity for VantageCloud is described in the Supported Google Cloud Connectivity Options table below.

Supported Google Cloud Connectivity Options	
Connectivity Options	Details
VPN	<ul style="list-style-type: none"> • Up to 3 Gbps per VPN tunnel for the sum of ingress and egress • Subject to Google Cloud published data rates for a Google Cloud managed VPN Gateway • One VPN Gateway is included with the subscription • Additional VPN Gateways sold separately
VPC Connectivity	Configure VPC Network Peering with one or more customer Google Cloud VPCs.

7. Supported Google Cloud Instances

VantageCloud offers instance options based on customer infrastructure and performance requirements. Instances are preconfigured with Teradata software, as shown in the Supported Google Cloud Instances table below.

Supported Google Cloud Instances					
Engine	Instance Series	Instance Size	Instance Limit	TCore Per Instance	Key Attributes
Analytics Database	N1	XSmall	2-128	2.55	Separate compute and storage for elasticity Fallback for availability
		Small		4.79	
		Medium 1		6.39	
		Medium 2		7.99	
		Large		9.59	
		XLarge		12.79	
	N2v1	XSmall	2-128	2.55	
		Small		4.79	
		Medium 1		6.39	
		Medium 2		7.99	
		Large		9.59	
		XLarge		11.19	
	N2v2	XSmall	2-128	2.55	
		Small		4.79	
		Medium 1		6.39	
		Medium 2		7.99	
		Large		9.59	
		XLarge 1		11.19	
		XLarge 2		12.79	

8. Supported Google Cloud Regions

VantageCloud is supported in the Google Cloud Regions indicated in the Supported Google Cloud Regions table below.

Supported Google Cloud Regions	
Region Name	Region
Americas	
United States (Oregon)	us-west1
United States (Los Angeles)	us-west2
United States (Las Vegas)	us-west4
United States (Iowa)	us-central1
United States (South Carolina)	us-east1
United States (Northern Virginia)	us-east4
Canada (Montréal)	northamerica-northeast1
Europe	
Belgium (St. Ghislain)	europa-west1
United Kingdom (London)	europa-west2
Germany (Frankfurt)	europa-west3
Poland (Warsaw)	europa-central2
Zürich (Switzerland)	europa-west6
Asia Pacific	
Japan (Tokyo)	asia-northeast1
Indonesia (Jakarta)	asia-southeast2
South Korea (Seoul)	asia-northeast3
Australia (Sydney)	australia-southeast1