

Connect Teradata with Teradata using QueryGrid

Many Teradata customers are interested in Teradata Vantage in the cloud. This guide will help you to connect Teradata Vantage to another Teradata Vantage on AWS system using the QueryGrid Teradata Connector.

The procedure offered in this guide has been implemented and tested by Teradata. However, it is offered on an as-is basis. Teradata QueryGrid supports Teradata connector and we highly encourage you to work with Teradata to determine the optimal configuration and architecture. This paper approach does not replace official product documentation.

We encourage your feedback. We want to understand what you found useful, and how we can improve this guide. Please send your feedback to [shamira.joshua@teradata.com](mailto:shamira.joshua@teradata.com) and [wenjie.tehan@teradata.com](mailto:wenjie.tehan@teradata.com).

## Overview

This article describes minimal steps used for a cloud burst scenario where the demand for computing capacity spikes and extra computing power is needed to offload the additional demand. A new Vantage system is deployed to handle the overflow traffic as the result in this case, and Teradata QueryGrid manager is used to establish the connection between the two Vantage systems and move the data in between them. This article will highlight deployment requirements for [Teradata Vantage](https://www.teradata.com/Vantage),[Teradata Viewpoint](https://www.teradata.com/Products/Ecosystem-Management/IntelliSphere/Viewpoint), and [Teradata QueryGrid](https://www.teradata.com/Products/Ecosystem-Management/IntelliSphere/QueryGrid).

We will use Teradata Viewpoint to configure these services to connect seamlessly between the platforms. Lastly, we will create a foreign server connection and leverage the QueryGrid fabric to execute SQL from one Vantage system to another Vantage system.

This is a diagram of the workflow.

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*Note: If your environment is different than what’s described above, contact Teradata Professional Services for optimal configuration of the environment.*

### 

### About Teradata Vantage

Vantage is the modern cloud platform that unifies data warehouses, data lakes, and analytics into a single connected ecosystem.

Vantage combines descriptive, predictive, prescriptive analytics, autonomous decision-making, ML functions, and visualization tools into a unified, integrated platform that uncovers real-time business intelligence at scale, no matter where the data resides.

Vantage enables companies to start small and elastically scale compute or storage, paying only for what they use, harnessing low-cost object stores and integrating their analytic workloads.

Vantage supports R, Python, Teradata Studio, and any other SQL-based tools. You can deploy Vantage across public clouds, on-premises, on optimized or commodity infrastructure, or as-a-service.

### About Teradata QueryGrid™

Teradata QueryGrid 2.x is a data analytics fabric that provides seamless, high-performing data access, processing, and movement across one or more data sources.

QueryGrid supports the following connectors:

* Teradata Database
* Hive
* Spark SQL
* Oracle (only as a target connector)
* Starburst Enterprise Presto

For more information see the [Teradata QueryGrid Installation and User Guide](https://docs.teradata.com/search/books?filters=prodname~%2522Teradata+QueryGrid%2522&sort=last_update&content-lang=en-US) and choose the latest version.

## Prerequisites

You should be familiar with the AWS Console, AWS concepts, Teradata Viewpoint, QueryGrid Manager, Teradata Tools and Utilities, and Teradata Vantage.

You will need the following accounts and systems:

* An [AWS account](https://portal.aws.amazon.com/billing/signup#/start),
* An [Amazon EC2 Key Pair](https://docs.aws.amazon.com/AWSEC2/latest/UserGuide/ec2-key-pairs.html#having-ec2-create-your-key-pair) to connect to the nodes,
* A clustered [Placement Group](https://docs.aws.amazon.com/AWSEC2/latest/UserGuide/placement-groups.html) for Vantage instances

Assumptions made:

* An existing Vantage Production instance and access to the instance. In this article, we use demo\_user as the database user to the production Vantage instance, and weather as the sample table where the data that needs to be offloaded is in.

# Procedure

Once you have met the prerequisites, follow these steps:

1. Prepare
2. Deploy Teradata products on AWS (DIY)
3. Configure Teradata Viewpoint
4. Create a Foreign Server
5. Offload Production Data
6. Cleanup

As you complete the steps, make note of the user names and passwords as well as private and public IP addresses for use in later directions.

## 

## Prepare

This step is needed if you have not subscribed to Teradata products.

### Subscribe to Teradata products

At least three Teradata products are needed for this integration: Vantage, Viewpoint, and QueryGrid Manager. Before using the Teradata products, you must subscribe to them. If you’ve already subscribed to these three products in the [AWS Marketplace](https://aws.amazon.com/marketplace), you may skip this instruction.

Assuming you already have the Vantage systems, for the rest of the products below, click on **Continue to Subscribe** button on the top right corner, and **Accept Terms**.

* [Viewpoint (Multiple systems)](https://aws.amazon.com/marketplace/pp/B01DJUORHE?qid=1543662175846&sr=0-5&ref_=srh_res_product_title). Viewpoint is offered for a single system and multiple systems. We need the multiple system version.
* [QueryGrid Manager](https://aws.amazon.com/marketplace/pp/B075HN2LFZ?qid=1543662161195&sr=0-1&ref_=srh_res_product_title).

## Deploy Teradata Products on AWS (DIY)

You can deploy the Teradata products—Vantage, Viewpoint and QueryGrid Manager—separately from [AWS Marketplace](https://aws.amazon.com/marketplace/search/results?x=0&y=0&searchTerms=teradata) or deploy them simultaneously using a **Teradata Ecosystem Template** ([Full Production](https://www.teradata.com/Cloud/AWS/Do-it-Yourself)). However, the Ecosystem Template also deploys servers that are not required for this integration.

For simplicity, we will deploy the three products separately in this article.

### Deploy Teradata Vantage Enterprise (DIY)

Browse to [Teradata Vantage Enterprise (DIY)](https://aws.amazon.com/marketplace/pp/B01LW1R13T?qid=1616707990852&sr=0-7&ref_=srh_res_product_title) in the AWS Marketplace, click Continue to Subscribe.

On the Subscribe to this software page, click Continue to Configuration.

On the Configure this software page, choose the region where the production system resides, and leave the rest as default. Click Continue to Launch.

Make a note of the region because you will use the same region for Teradata Viewpoint and QueryGrid Manager configuration.

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On the Launch this software page, choose Launch CloudFormation as Choose Action, and then click Launch. This will take you to the AWS CloudFormation page.

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On the Create stack page, click Next.

On the Specify stack details page and enter or select the following information:

* Enter the Stack name (e.g. tdTemp)
* Enter the DBC Password
* Choose your System Timezone (optional)
* For Node Configuration, choose the number of the nodes you need. In this example, we are using 1 node for simplicity.
* Choose VPC from the list
* Choose Database Subnet from the list
* Enter Database Placement Group you created (e.g., QueryGridTest)
* Enter 0.0.0.0/0 for Security Group. Note: If you have requirement for security group, enter the CIDR block that’s applicable for you.
* Choose a Key Pair.

Click Next.

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On the Configure stack options page, click Next.

On the Review page, review the information you just entered. Make modifications if necessary.

Scroll all the way down, check I acknowledge that AWS CloudFormation might create IAM resources with custom names, and click Create stack.

*Note: We are deploying a 1-node Vantage production system as an example. Work with your Teradata Account Team to determine the appropriate size and instance type for your Vantage systems.*

Deployment process can take anywhere between 30 to 60 minutes depending on your configuration and the availability of resources in your region. Wait until the whole stack has been created successfully before moving onto next step.

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You can view the instances from the [EC2 console](https://console.aws.amazon.com/ec2#Instances).

### Deploy Teradata Viewpoint (Multiple Systems)

Browse to [Teradata Viewpoint (Multiple Systems, DIY)](https://aws.amazon.com/marketplace/pp/B01DJUORHE?qid=1605050589633&sr=0-4&ref_=srh_res_product_title) site.

Click Continue to Subscribe .

On the Subscribe to this software page, click Continue to Configuration.

On the Configure this software page, choose the same region you used for the new Vantage instance, use default for others and click Continue to Launch.

On the Launch this software page, use Launch from Website for Choose Action. Choose the same VPC and Subnet you used for the new Vantage instance from the list.

For Security Group Settings, use the security group created by the Vantage instance (e.g. tdTemp-DBSecurityGroup-1245678910ABC).

Pick your Key Pair from the Key Pair Settings list, and click Launch.

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Browse to [AWS EC2 Instances](https://console.aws.amazon.com/ec2" \l "Instances) page to monitor the status of the instances.

Change the viewpoint instance name from blank to viewpoint by clicking on the to the left of the Viewpoint Instance ID under Name**.** If you can’t tell which one is viewpoint, click on the instance and check the AMI name. The Viewpoint AMI name should have Viewpoint in it.

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The Teradata Viewpoint instance is ready when the Instance state is Running, and it has passed the Status check.

### Deploy Teradata QueryGrid Manager

Browse to [Teradata QueryGrid Manager (DIY)](https://aws.amazon.com/marketplace/pp/B075HN2LFZ?qid=1604702274847&sr=0-11&ref_=srh_res_product_title) site.

Click Continue to Subscribe.

On the Subscribe to this software page, click Continue to Configuration.

On the Configure this software page, choose the same region you used for the new Vantage instance and Viewpoint, click Continue to Launch .

On the Launch this software page, use Launch from Website for Choose Action. Choose the same **VPC** and **Subnet** you used for the new Vantage instance from the list.

For Security Group Settings, use the security group created by the Vantage instance (e.g. tdTemp-DBSecurityGroup-12345678910ABC).

Pick your Key Pair from the Key Pair Settings list, use default for the rest and click Launch.

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Browse to [AWS EC2 Instances](https://console.aws.amazon.com/ec2#Instances) page to monitor the status of the instances.

Change the QueryGrid Manager instance name from blank to querygrid by clicking on the to the left of the QueryGrid Manager Instance ID under Name**.** If you can’t tell which one is QueryGrid Manager, click on the instance and check the AMI name. The QueryGrid AMI name should have tdqg-manager in it.

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The Teradata QueryGrid Manager instance is ready when the Instance state is Running, and it has passed the Status check.

## Configure Teradata Viewpoint

Before we can configure QueryGrid, we first need to add Teradata Vantage and QueryGrid Manager systems to the Viewpoint Monitored Systems portlet.

From your browser, open the Viewpoint portal logon screen using the public IP address created in [Deploy Teradata Viewpoint](#_Deploy_Teradata_Viewpoint) step.

|  |
| --- |
| https://<ec2-xx-xx-xxx-xx.us-west-2.compute.amazonaws.com> |

Ignore the “Your connection is not private” message.

Click on Advance and then Proceed to link.

Log on to the Viewpoint portal as admin. The Password for Viewpoint is the viewpoint instance’s AWS Instance ID, which is in the form of I-123456789.

### Setting Up Viewpoint Admin Portlet

#### Install QueryGrid Root Certificate

Click the admin portlet (gear icon)  on the upper right, and then click Certificates.

From the Setup list, click Certificate Authority.

Click Install Certificate.

Enter an alias (e.g. qg\_cert) for the certificate, up to 30 characters.

Select the A trusted SSL-enabled service option.

Enter the *private-IP* address for hostname of the Teradata QueryGrid Manager instance.

Enter 9443 as the port number.

Click Install.

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#### Adding systems to Monitored Systems

At Select Portlet dropdown list, select Monitored Systems.

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Click the + sign next to Systems, and choose Add Teradata System.

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Add a System Nickname for Teradata (e.g. vantage) and check Enable system.

Add the TDPID (private IP address) of the Teradata Vantage Production Instance.

Configure the login credential to be used by system tasks. (Name is **dbc** and the password is the password you created for dbc in when you launched the production instance)

Choose Time Zone.

Click Apply.

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Repeat to add the new Vantage System to Monitored Systems with following properties:

* System Nickname: tdTemp
* TDPID: Vantage Instance’s private IP (Node 1)
* Login: dbc/<dbc password>
* Time Zone: Choose time zone

Next, add QueryGrid Manager to Monitored Systems.

Click + next to Systems and select Add QueryGrid.

Under General System Details, enter a system nickname (e.g. querygrid), up to 8 characters.

Select the Enable system check box.

Enter the private IP address for Host ID of the Teradata QueryGrid Manager.

Under Login, enter the credentials:

* Name: viewpoint
* Password: QueryGrid manager instance’s Instance ID, which is in the form of I-123456789.

Click Apply and Close Admin portlet.

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### Configure QueryGrid in the Viewpoint QueryGrid Portlet

In this section, we will add the QueryGrid portlet to Viewpoint. This will include adding a Data Center (optional), Data Source Systems, and nodes for Vantage.

Add QueryGrid portlet to the Viewpoint Portal.

In the portal, click Add Content.

Locate and click the QueryGrid portlet.

Click Add.

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The portlet is added to the current page.

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### Add Data Center (optional)

Under Fabric Components, select Data Centers.

By default, the data center AWS <region> is created for you. If you are using the default data center, you may skip following step to [*Adding a Data Source System*](#_Add_a_Data).

If you want to create a different Data Center, click Edit on default Data Center created during QueryGrid Manager deployment to rename, or the + sign next to Data Centers to create a new one and click Save.

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### Add a Data Source System

Select Systems.

Click + next to Systems, then Add System.

At Add System, enter system name (e.g. tdTemp) for Teradata Data Source System.

Select Data center.

For Resource Allocation, set *Max memory per node* to *1GB.*

Click Save.

Repeat to add Vantage Production System with following properties:

* System name: tdProd
* Max memory per node: 1GB

### Add Nodes to a System

You will need to add the private IP addresses of your Nodes to the respective Data Source Systems created in the previous step – new Vantage node(s) to the tdTemp Data Source System and Vantage production node(s) to the tdProd Data Source System. This will enable the *tdqg-node* package to auto install across all nodes.

At Fabric Components -> Systems, select tdTemp.

On the Nodes tab, click + next to Nodes.

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On the Add Nodes page, Click Auto Install: Perform the install of the tdqg-node package and the auto-generated configuration file across all nodes using SSH.

In the Nodes box, enter the *private IP* address(es) for your new Teradata Vantage node(s).

In the SSH user box, enter the name of the SSH user (e.g. *ec2-user*) to install the *tdqg-node* rpm file on each node.

Under Authentication Mechanism, enter the SSH key and copy and paste your private key file content (<my-key-pair>.pem) to the text box to the right of the SSH Key.

Click Save.

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Ensure Teradata node software installation status displays *Success*.

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Click Close.

Repeat to add Vantage Production Node(s) with following properties:

* Systems: tdProd
* Nodes: production Instances’ private IP(s)
* SSH user: ec2-user
* Authentication Mechanism: SSH Key and copy and paste your private key file content to the text box

### Add a User Mapping

User mappings allow a user logged on to the initiating system to submit queries as a specific user on the target system. You can map multiple users on the initiating system to a single user on the target system, however, you cannot map multiple users on the target system to a single user on the initiating system.

Under Fabric Components, select User and Role Mappings.

Click + next to User and Role Mappings.

Enter a name (e.g. td2td).

Click Save.

On the Users tab, click + next to Users.

Enter the name of the user.

On the initiating system (e.g. qg\_user).

On the target system you want to map to (e.g. demo\_user) .

Click Save.

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### Add a Fabric

Under Fabric Configuration, select Fabrics.

Click + next to Fabrics, enter name (e.g. T2TFabric).

Enter the port number in the Port box (e.g.1024).

Click Save.

### Add Connectors

You will need to add an *initiating* connector for Teradata (tdTemp) and *target* (tdProd) connector for **T2TFabric**.

Under Fabric Configuration, select Fabrics and click a fabric (e.g. T2TFabric) to which you want to add a connector.

Click the **+** next to Connectors.

Enter a name for Teradata Connector (e.g. tdInit).

In the System list, select a (Data Source) system you want to add this connector to (e.g. tdTemp).

Next to the Allowed OS users, add *teradata* user.

For Connector Software name, choose tdqg-teradata-connector (02.13.00.00-1) or the latest one and click CHANGE at the confirmation page.

For Server, enter *private IP* address of the new Teradata Node.

Under Driver Nodes, choose Make available on all nodes.

Optionally, from the Associated Viewpoint system list, select a Viewpoint system (e.g. tdTemp) to associate with this connector.

Click Save.

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Repeat to add connector for Vantage Production Instance with the following properties:

* Connector name: tdTarget
* System: tdProd
* Allowed OS users: teradata
* Software name: tdqg-teradata-connector (02.13.00.00-1)
* Server: Vantage Production Instance’s Private IP
* Associated Viewpoint system: vantage

### Add a Link

Links are named configurations that include an initiating connector and a target connector. The name of the link is used by Vantage to create the foreign server.

Click the Links tab under the same Fabrics (e.g. T2TFabric).

Click **+** next to Links.

Enter a name (e.g. TD2TD).

Select Initiating Connector (e.g. tdInit).

Select Target Connector (e.g. tdTarget).

Choose User and Role mapping user created in previous step (e.g. td2td).

Click Save.

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### Run Diagnostic Checks (optional)

Run diagnostic checks on connectors and link(s) can help to ensure the correctness of the connectors and link(s), and the ability to access the target system.

On the Connectors/Links tab, click dropdown arrow  next to the applicable connector or link, and select Diagnostic Check.

To test the connector/link, click Active for Test configurations.

If applicable, set the values for the connector properties. Click Run.

The test results display in the Connector Diagnostic Check/Link Diagnostic Check window.

Sample diagnostic check outputs:

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For more information see the [documentation](https://docs.teradata.com/r/UPxOSCRaN1wk~UmYOpG7Ig/RglCURI0PptaNb2~lPMdZw).

## Create Foreign Server

Now we are ready to create a foreign server on the new Vantage instance to connect to the Vantage Production system.

You can use any Teradata Tools and Utilities to run the SQL command (BTEQ, Teradata Studio, etc.).

Log on to the initiating Teradata Vantage system (tdTemp) using the public IP of the Vantage instance as a database administrator, such as dbc, and create a user to perform database operations.

|  |
| --- |
| CREATE USER “qg\_user” AS PERMANENT = 100000000, PASSWORD = <password>, SPOOL = 100000000, TEMPORARY = 100000000; |

*Note: The Perm, Spool and Temp space used here is only an example. Contact your DBA to decide what would be sufficient space for user qg\_user.*

Grant additional privileges to qg\_user as DBC

|  |
| --- |
| GRANT EXECUTE FUNCTION ON TD\_SYSFNLIB TO qg\_user; |
| GRANT CREATE SERVER ON TD\_SERVER\_DB TO qg\_user; |
| GRANT CREATE AUTHORIZATION ON TD\_SERVER\_DB TO qg\_user; |

Log on as the qg\_user to the initiating Teradata Vantage system (tdTemp) using the public IP address, and create an authorization object for the target server, for example:

|  |
| --- |
| CREATE AUTHORIZATION TD\_SERVER\_DB.tdservice AS DEFINER TRUSTED USER 'demo\_user' PASSWORD '<password>'; |

An authorization object is created in the TD\_SERVER\_DB database. Using the DEFINER TRUSTED clause makes the authorization available globally to all users.

Create the foreign server connection to Vantage Production System as qg\_user

|  |
| --- |
| CREATE FOREIGN SERVER <target\_server\_name> |
| EXTERNAL SECURITY DEFINER TRUSTED <target\_server\_auth> |
| USING |
| LINK(*'linkname'*) |
| VERSION (*'version'*) |
| DO IMPORT WITH TD\_SYSFNLIB.QGInitiatorImport, |
| DO EXPORT WITH TD\_SYSFNLIB.QGInitiatorExport; |

For example, using the Teradata-to-Teradata connector TD2TD looks like following:

|  |
| --- |
| CREATE FOREIGN SERVER prodtd |
| EXTERNAL SECURITY DEFINER TRUSTED tdservice |
| USING |
| LINK('TD2TD') |
| VERSION('active') |
| DO IMPORT WITH TD\_SYSFNLIB.QGInitiatorImport, |
| DO EXPORT WITH TD\_SYSFNLIB.QGInitiatorExport; |

## Offload Production Data

Finally, use any Teradata client tool to move the data.

Log on as qg\_user to the initiating Teradata Vantage system (e.g. tdTemp) using the public IP address.

Create the table the data is moving to. This table has the same definition as the original table in the production system.

|  |
| --- |
| CREATE MULTISET TABLE weatherNew,FALLBACK , |
| NO BEFORE JOURNAL, |
| NO AFTER JOURNAL, |
| CHECKSUM = DEFAULT, |
| DEFAULT MERGEBLOCKRATIO, |
| MAP = TD\_MAP1 |
| ( |
| … |
| ); |

Insert data from the production system (tdProd) to the new system (tdTemp).

|  |
| --- |
| INSERT INTO weatherNew |
| SELECT \* FROM weather@prodtd; |

Once done, check the weatherNew table

|  |
| --- |
| select count(\*) from weatherNew; |

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This is the same as the original table.

## Cleanup

To avoid incurring additional charges to your AWS resources used, follow these steps.

### Delete the Vantage instance

Browse to [CloudFormation console](https://console.aws.amazon.com/cloudformation).

Click on the Vantage stacks you just created, and Delete the stacks.

### Terminate the Viewpoint instance

Log out of Viewpoint.

Browse to [EC2 Console](https://console.aws.amazon.com/ec2#Instances).

Click on the viewpoint instance.

Go to Instance state and Terminate instance

### Terminate the QueryGrid instance

On the [EC2 Console](https://console.aws.amazon.com/ec2#Instances), click on the querygrid instance.

Go to Instance state and Terminate instance

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