



What would you do if you knew?™

Teradata Database on VMware Base, Advanced, Enterprise Tiers Getting Started Guide

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Purpose

Use the information in this guide to install, configure, and upgrade Teradata Database on VMware.

Audience

This guide is intended for use by:

- System Administrators who configure hardware in preparation for installing Teradata Database on VMware.
- Administrators who install, configure, and upgrade Teradata Database on VMware.
- Database and software professionals who use Teradata Database on VMware, are responsible for ensuring the database is running, and use client applications to access the database for development and testing or production.

Prerequisites

Before installing software, you must prepare the host nodes, including configuring virtual disks, datastores, and network connections.

You must have a Teradata Support account (<https://access.teradata.com>) to submit incidents and download software patches.

You must have a product license that entitles you to use the Teradata software. For information on activating your license, see *Teradata Entitlement Management System (EMS) Customer User Guide*.

This guide assumes a solid understanding of virtualization, including experience with:

- Configuring hardware in preparation for installing Teradata Database on VMware.
- Managing vSphere, vCenter, and ESXi technology.
- Terms such as standard switches, datastores, VM templates, ova, ovf, and so forth.
- Network setup for Teradata Database nodes for a bare metal installation and how it relates to a vSphere installation.
- Software applications that access Teradata Database for development, testing, or production.
- Teradata Database configurations including terminology. See [VMware and Teradata Terminology](#).

Revision History

Date	Description
January 2018	<ul style="list-style-type: none"> Updated licensing information to reflect the new EMS, https://slem.teradata.com/ecp.
December 2017	<ul style="list-style-type: none"> Updated to add support for Teradata Database 16.20. Added the following new topics: <ul style="list-style-type: none"> <i>Fallback</i> <i>Multiple Port Groups with Same Name</i>
September 2017	<ul style="list-style-type: none"> Added support for 128 nodes. Added support for Teradata Database 16.10, Teradata Ecosystem Manager, and multiple Server Management VMs for high availability. Updated the Teradata Database on VMware template versions. Added a new chapter, <i>Installing and Configuring Other Teradata Applications</i> Added the following new topics: <ul style="list-style-type: none"> <i>Supported Software for Teradata Database on VMware</i> <i>Teradata Database Features</i> <i>Preparing the ova Templates</i> <i>Preparing the Templates in the Local System</i> <i>Installing Teradata Distribution for Presto</i> <i>Installing and Configuring Teradata Studio</i>
June 2017	<ul style="list-style-type: none"> Renamed this book to <i>Teradata Database on VMware Developer Tier Getting Started Guide</i>. Changed terminology from edition to tier. Changed to using a deployment executable file instead of deployment scripts to deploy the Teradata Database on VMware software. Added VMware administrator privileges you need to install and configure the Teradata Database on VMware software. Updated the information about database sizing. Added instructions on running PowerCLI as Administrator. Changed Teradata Data Stream Utility to Teradata Data Stream Controller, which is the name of the component within the DSU product.
January 2017	<ul style="list-style-type: none"> Updated to add support for Teradata Database 16.00 and remove support for Teradata Database 15.00.
November 2016	<ul style="list-style-type: none"> Updated to reflect availability of Teradata Database on VMware Development Edition at http://downloads.teradata.com/. References to "Base Edition" now refer to "Enterprise Edition."
September 2016	<p>Initial release.</p> <p>This book was previously known as <i>Teradata Virtual Machine Developer Edition Installation, Configuration, and Upgrade Guide</i>.</p>

Supported Releases

This guide applies to the following releases:

- Teradata Database 16.20
- Teradata Database 15.10

Additional Information

Related Documents

Title	Publication ID
<i>Data Stream Utility Installation, Configuration, and Upgrade Guide for Customers</i>	B035-3153
<i>Electronic Software Distribution (ESD) Guide</i>	BCD0-0718-0000
<i>Parallel Upgrade Tool (PUT) Reference</i>	B035-5716
<i>Security Administration</i>	B035-1100
<i>SQL Data Definition Language Syntax and Examples</i>	B035-1144
<i>SQL External Routine Programming</i>	B035-1147
<i>Temporal Table Support</i>	B035-1182
<i>Teradata Data Stream Architecture User Guide</i>	B035-3150
<i>Teradata Database Administration</i>	B035-1093
<i>Teradata Database Node Software Migration Guide Linux</i>	B035-5942
<i>Teradata Database on VMware Developer Tier Getting Started Guide</i>	B035-5938
<i>Teradata Director Program Reference</i>	B035-2416
<i>Teradata Ecosystem Manager User Guide</i>	B035-3201
<i>Teradata Entitlement Management System (EMS) Customer User Guide</i>	B035-5960
<i>Teradata QueryGrid: Teradata and Hortonworks Hadoop Installation Guide</i>	B035-5989
<i>Teradata QueryGrid: Teradata Database-to-Cloudera Distribution for Hadoop Installation Guide</i>	B035-5983
<i>Teradata QueryGrid Teradata Database-To-Presto Installation and User Guide</i>	N/A
<i>Teradata Server Management Web Services User Guide</i>	B035-5350
<i>Teradata Tools and Utilities for IBM z/OS Installation Guide</i>	B035-3128
<i>Teradata Viewpoint User Guide</i>	B035-2206
Teradata Database on VMware Installation	Accessed through https:// access.teradata.com .
• Teradata Database single-node systems: Knowledge Article KAC13A25E	

Title	Publication ID
<ul style="list-style-type: none"> Teradata Database MPP systems: Knowledge Article KAC13D39E 	
<i>Utilities</i>	B035-1102

Related Links

URL	Description
http://www.teradata.com	External site for product, service, resource, support, and other customer information.
http://www.info.teradata.com	External site for published Teradata customer documentation.
https://access.teradata.com	External site for access to the Teradata software server. Accessible only with an active service contract. Orange Books, technical alerts, knowledge repositories, and access to downloading software packages.
https://community.teradata.com/tdvm	Community-based product forum for Teradata Database on VMware.
https://community.teradata.com/presto	Community-based product forum for Teradata Distribution for Presto.
http://teradata.github.io/presto/docs/current/installation/installation-presto-admin.html	Documentation for installing and configuring Teradata Distribution for Presto.

Product Safety Information

This document may contain information addressing product safety practices related to data or property damage, identified by the word *Notice*. A notice indicates a situation which, if not avoided, could result in damage to property, such as equipment or data, but not related to personal injury.

Example

Notice:

Improper use of the Reconfiguration utility can result in data loss.

Teradata Database on VMware

Teradata Database on VMware is a SUSE Linux Enterprise Server (SLES) operating system and Teradata Database packaged into a virtual container that runs in a virtualized environment on third-party hardware. You must have administrative privileges on the destination VMware environment to install and configure the virtual machines.

Note:

For each licensed physical core you purchase, you get two virtual cores.

The Teradata Database on VMware software consists of properties file, hardware configuration scripts, and a deployment executable file.

The product previously known as Teradata Virtual Machine is now known as Teradata Database on VMware.

Supported Software for Teradata Database on VMware

The following is a list of Teradata supported software for Teradata Database on VMware.

An additional cost applies to some of the following software. For a list, see [Teradata Database License Tiers](#).

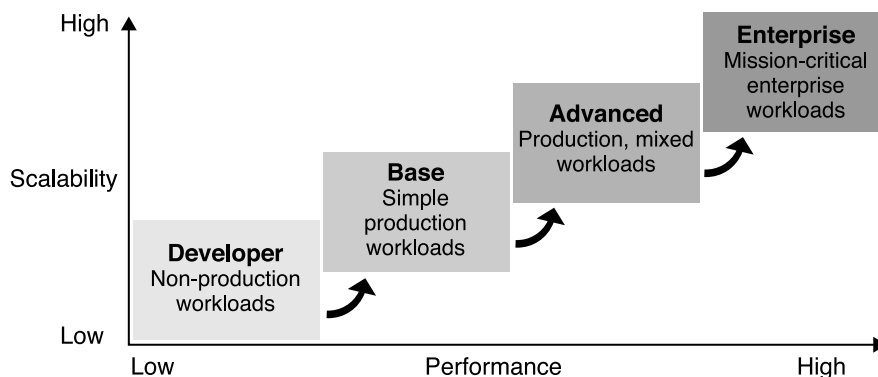
Software Name	Description
Teradata Database	Provides the same full-feature data warehouse software that powers analytics at many of the world's greatest companies, and is available with local and attached storage.
Teradata Data Stream Controller	Provides administrative functions and metadata storage and is a key component of the backup and restore of Teradata systems in the public cloud. The Data Stream Controller (DSC) is an administrative server required to enable object-level backup and restore of the Teradata Database. It contains a repository for all backup and restore job definitions and as well as related configuration details for Teradata systems and backup targets.
Teradata Ecosystem Manager	Provides an end-to-end approach to meeting application service level agreements through monitoring, administration, and control of both single and multi-system environments to let you more effectively manage every part of your data warehouse environment.
Teradata Parallel Upgrade Tool	Provides a way to upgrade Teradata Database and other Teradata software.

Software Name	Description
	This software is bundled with Teradata Database.
Teradata QueryGrid 1. <i>n</i>	Provides bi-directional data transfer, ad-hoc query capabilities and push-down processing for running queries using data and analytics on the Teradata Database. Enables querying of metadata, partition pruning, push-down processing, and importing data and joins from Teradata Database to Hadoop file systems (HDP and CDH), from Teradata Database to Presto, and between Teradata Database systems.
Teradata REST Services	Provides an interface to Teradata Database allowing application developers a simplified, modern interface to connect to data from a web page or application.
Teradata Server Management	Monitors the VM and generates alerts related to database and operating system errors and operational state changes. Events that affect the operation of the system generate alerts. Teradata Database on VMware supports multiple Server Management VMs. Multiple VMs (CMICs) provide high availability and management of larger database systems. High availability requires at least two CMICs. Each CMIC can manage up to 70 nodes with reserve capacity to manage an additional 70 failover nodes from another CMIC.
Teradata Studio	Provides a desktop tool for performing database administration, query development, and management tasks on Teradata Databases, Teradata Aster Databases, and Hadoop systems. This software is obtained from Teradata Community and is installed and configured separately from other software components.
Teradata Tools and Utilities	Provides utilities and libraries for integrating your Teradata system into your enterprise and streamlining the daily data warehouse management tasks, such as moving massive volumes of data and accessing multiple data sources in parallel, and improving your overall Teradata system performance. This software is bundled with but installed and configured separately from Teradata Database.
Teradata Viewpoint	Provides a web-based management portal for Teradata performance and health management which is easy to use. It provides a consistent interface using configurable portlets which allows you to customize your own systems management dashboard. Teradata Data Lab, which is included in certain versions of Teradata Viewpoint, allows you to provision and manage analytic workspaces in the Teradata data warehouse.

Introduction to Teradata Database License Tiers

Teradata Database on VMware offers four database license tiers depending on your use case. Each tier differs in scalability and performance. The Base, Advanced, and Enterprise Tiers can be used as an upgrade path from Teradata Express. This book is for these three tiers.

A free Developer tier is also available and can be used for evaluation purposes. Developer can be used for proof of concepts, development and testing, data validation, and as a sandbox for Teradata Database users. For more information, see *Teradata Database on VMware Developer Tier Getting Started Guide*.



Each tier is unique in what it offers in the following areas:

- Amount of system concurrency and number of nodes
- Teradata Database features
- Teradata Database software applications that are available at no additional cost
- Level of customer support

For a list of what is offered in each tier, see [Teradata Database License Tiers](#).

Teradata Database License Tiers

Teradata Database on VMware offers license tiers that include the rights to use the software listed.

Teradata Database on VMware Base, Advanced, and Enterprise come with Teradata Premier Software Support. You can apply software updates to the Teradata software on these tiers and access Teradata Support for assistance.

The Developer tier is free and for evaluation purposes. When it is deployed, it operates as a fully functional instance of the configured Teradata Database. You cannot upgrade the Teradata software, apply software updates, or access Teradata Support with this tier. To use a later version of Developer, you must install a new version, resulting in a loss of data. Community-driven customer support is available for Developer at <https://community.teradata.com/tdvm>.

	Developer	Base	Advanced	Enterprise
Customer Support				
Support type	Community	Premier	Premier	Premier
Scalability				
System concurrency limit	2	15	Unlimited	Unlimited
Node limit	2	128	128	128
AMPs/vNode	4	6 to 12	6 to 12	6 to 12
Maximum database size	6 TB	Unlimited	Unlimited	Unlimited
Database Features				

	Developer	Base	Advanced	Enterprise
Columnar	•	•	•	•
Temporal	•	•	•	•
Row-level Security	•	•	•	•
Secure Zones	•	•	•	•
Workload Management			TIWM	TASM
Applications Available at No Additional Cost				
Teradata Ecosystem Manager	•	•	•	•
Teradata Data Stream Controller (a component of Teradata Data Stream Utility)	•	•	•	•
Teradata REST Services	•	•	•	•
Teradata Server Management	•	•	•	•
Teradata Studio	•	•	•	•
Teradata Tools and Utilities, including Teradata Parallel Transporter	•	•	•	•
Teradata Viewpoint (Single Teradata System)	•	•	•	•
Applications Available for an Additional Cost				
Teradata QueryGrid		•	•	•

Obtain the Teradata Tools and Utilities packages at <https://access.teradata.com>.

VMware and Teradata Terminology

You should be familiar with the following terms regarding VMware and virtualization.

VMware or Virtualization Term	Description
VMware vSphere	VMware vSphere as a suite of products that provides network virtualization services to hosts and VMs. vSphere links VMs to each other within a single host, connects VMs to the physical network, joins VMkernel services to the physical network, and provides networking for the management interface which runs management services for vSphere hosts.
VMware vCenter	vCenter is a server that is installed on either Linux or Windows and provides central management of VMs and ESXi hosts.
VMware ESXi	ESXi is also a component of vSphere. It is a hypervisor that defines processor, memory, storage, and networking resources into multiple VMs that run applications.

VMware or Virtualization Term	Description
	ESXi is installed directly on the server hardware, inserting a virtualization layer between the hardware and the operating system. ESXi partitions a physical server (pNode) into multiple secure VMs (vNodes) that run on the same physical server. Each VM represents a complete system, with processors, memory, networking, storage, and BIOS so that the operating system and applications can be installed and run in the VM without modification. VMs are also completely isolated from each other by the virtualization layer to prevent a crash or configuration error in one VM from affecting the others.
vCPU	A virtual CPU corresponds to one hyperthreaded core. Teradata Database on VMware requires hyperthreading be enabled.
vSphere Virtual Switch	The vSphere virtual switch lets you set up VM access switching from a centralized interface so you can provision, administer, and monitor virtual networking across multiple hosts and clusters.

You should understand the following Teradata terminology.

Teradata Terminology	Description
Teradata Node	A Teradata node requires three pieces of software: a Trusted Parallel Application (TPA), Parallel Database Extensions (PDE), and an operating system. The Teradata Database is classified as a TPA. Teradata nodes can be either physical or virtual.
Physical Node (pNode)	A pNode is a physical machine running in a data center. Ensure all pNodes are connected identically to allow vNode TPA instances to be deployed to any ESXi host. One pNode corresponds to a single ESXi host or to the actual hardware, such as to one Dell 720, 730, and so on. During deployment, CPUs and memory are checked to ensure they are the same on all pNodes containing vNode TPA instances.
Virtual Node (vNode)	A vNode is a virtual node running on a pNode in a data center. pNodes can have multiple vNodes, as defined through the ESXi hypervisor. A single vNode corresponds to a single VM that runs Teradata software.

Requirements

The minimum requirements for hardware, Teradata software, and virtualization software are described in the table below. If you want to deploy a Server Management VM, you must have a valid Site ID. For assistance, contact Teradata Customer Support.

Component	Minimum Requirements (unless noted)
Teradata licensing	<p>A Teradata license is required and this guide provides the information you need to deploy the Teradata Database Base, Advanced, or Enterprise database license tiers.</p> <p>For general licensing information, see the <i>Teradata Entitlement Management System (EMS) Customer User Guide</i>.</p> <p>Note:</p> <p>For sites with Internet access, port 443 must be open to connect to the Teradata EMS server to successfully deploy Teradata Database on VMware.</p>
vCPU	<ul style="list-style-type: none"> Teradata Database (TPA): 1 to 12 (even numbers only, except for 1) DSC: 4 Teradata Ecosystem Manager: 4 Server Management: 2 Teradata Viewpoint: 2
Memory	<ul style="list-style-type: none"> Teradata Database (TPA): 12 GiB DSC: 16 GiB Teradata Ecosystem Manager: 32 GiB Server Management (CMIC): 16 GiB Teradata Viewpoint and Teradata REST Services: 16 GiB
Datastores for database storage	<p>Recommended: 24 internal HDDs configured in RAID-1, equating to a total of 12 LUNs, sized according to specifications. Each datastore should correspond to a single RAID-1 HDD. You can also deploy on a large storage area network that is sufficient for your needs, but it is not optimal for the best performance.</p>
Datastore formatting	VMFS 5 file system
Datastore space for template deployment	<p>Total size of all drives in each image:</p> <ul style="list-style-type: none"> Teradata Database (TPA): 200 GB DSC: 500 GB Teradata Ecosystem Manager: 500 GB Server Management (CMIC): 26 GB Teradata Viewpoint: 450 GB
RAID	<p>RAID-1 LUNs recommended.</p> <p>We suggest a configuration of 1 LUN used exclusively for each of the 12 datastores used for database storage, and the thirteenth datastore reserved for the deployment of Teradata Database operating system, Teradata Viewpoint, DSC, Teradata Ecosystem Manager, and Server Management.</p> <p>For more information, see Physical Storage Considerations.</p>
Server	<p>Dell PowerEdge R720xd/R730xd, or an HP Gen9 or similar system.</p> <p>Hyper-threading (HT) must be enabled.</p>
Network	<ul style="list-style-type: none"> BYNET: Two 10 GB networks to support redundancy

Component	Minimum Requirements (unless noted)
	<ul style="list-style-type: none"> • DSC: 10 GB separate network • Server Management: Two 10 GB 1 GB separate (isolated) physical networks for CMIC connectivity
VM deployment sizes	<ul style="list-style-type: none"> • Teradata Database (TPA): 200 GB (187 GiB) • DSC: 500 GB • Teradata Ecosystem Manager: 500 GB • Server Management (CMIC): 26 GB • Teradata Viewpoint: 456 GB
VMware ESXi	ESXi 5.5 release 2 and later
VMware licensing	A full VMware vSphere 6.0 license or VMware vSphere Essentials 6.0 license for at least one physical CPU (unlimited cores per CPU)
VMware vCenter	vCenter 5.5 release 2 and later
VMware vSphere Client	<ul style="list-style-type: none"> • VMware vSphere Client version 5.5 release 2 and later, using the Mozilla Firefox Extended Support Release (ESR) Web browser. Other browsers may not work properly with the VMware vSphere Client. • Server: <ul style="list-style-type: none"> ◦ 64 bit Windows Server 2012 R2 ◦ 64 bit Windows Server 2008 R2 SP1 • Workstation: <ul style="list-style-type: none"> ◦ 64 bit Windows 8.1 ◦ 64 bit Windows 7 SP1
VMware vSphere vSwitches	<ul style="list-style-type: none"> • For a Teradata Database single-node or MPP system: One vSphere standard vSwitch for public network. • For a Teradata Database MPP system: One vSphere standard vSwitch for public network; two extra vSphere standard vSwitches for the BYNET network (one is the minimum and two is recommended for redundancy). • For DSC: One extra vSphere standard vSwitch for DSC network. • For Teradata Ecosystem Manager: One vSphere standard vSwitch for public network. • For Server Management: Two extra vSphere standard vSwitches for the CMIC network (one is the minimum and two is recommended for redundancy). <p>If all the vNodes are within the same pNode, no physical adapters need to be attached to the vSphere standard vSwitch. If there are any physical adapters attached to the vSphere standard vSwitch, ensure they are cabled correctly. For more information on virtual switches, see Networking Considerations.</p>
Physical Switches	Physical switches are required to use Jumbo Frame (MTU 9000) for the BYNET and Teradata DSC private network or file transfer issues will occur when configuring the Teradata Database.

Component	Minimum Requirements (unless noted)
PowerCLI	<ul style="list-style-type: none"> • VMware PowerCLI 5.5 and later • Windows .Net Framework 4.5 • Windows PowerShell 4 and later • Requires either a Windows workstation or laptop to run PowerCLI against the vCenter

Following is an example of a minimum (2 or more) pNode configuration:

- CPU: 2 physical CPUs with 8 to 12 physical cores each for a total of 32 to 48 virtual cores per physical node
- Memory: 256GB
- Network:
 - BYNET: Two 10 GB networks to support redundancy
 - Server Management: Two 10 GB 1 GB separate (isolated) physical networks for CMIC connectivity
 - DSC: 10 GB separate network
- Storage: 26 internal drives of 1.2TB each with RAID-1 pairs yielding 13 ESXi datastores (1 for operating system images, 1 for the operating system installation datastore and 12 for database storage).

If you are using external storage or not using RAID-1, see [Physical Storage Considerations](#).

VMware Administrator Privileges

You must have VMware administrator privileges to install and configure Teradata Database on VMware software. If you do not have full VMware administrator privileges, your VMware administrator must set the following minimum permissions in vCenter for you, as an individual user, or for your role:

Datastore.AllocateSpace
 Network.Assign
 Resource.AssignVMTToPool
 System.Anonymous
 System.Read
 System.View
 VirtualMachine.Config.AddNewDisk
 VirtualMachine.Config.AddRemoveDevice
 VirtualMachine.Config.CPUCount
 VirtualMachine.Config.EditDevice
 VirtualMachine.Config.Memory
 VirtualMachine.Config.Resource
 VirtualMachine.Config.Settings
 VirtualMachine.GuestOperations.Execute
 VirtualMachine.GuestOperations.Modify
 VirtualMachine.GuestOperations.Query
 VirtualMachine.Inventory.CreateFromExisting
 VirtualMachine.Inventory.Delete
 VirtualMachine.Interact.PowerOff
 VirtualMachine.Interact.PowerOn

VirtualMachine.Interact.Reset
 VirtualMachine.Provisioning.DeployTemplate
 VirtualMachine.Provisioning.MarkAsTemplate

Database Sizing

TPA nodes use vCenter/ESXi datastores to create pdisks used by Teradata Database. Datastores can be created from RAID-1 pairs, larger RAID 5/6 LUNs, or in other ways. When you choose how to design the underlying storage devices to create datastores, take performance into consideration.

The following will help you determine the database size and help you calculate the Customer Data Space (CDS). CDS is the database space that is available for customer data.

pdiskSizeGB

To determine the CDS, use the pdisk size as a starting point. The initial pdisk size is considered the raw disk size. You will set the size in the `common.IT.properties.json` file using the `pdiskSizeGB` property. All Teradata Database vNodes have 3 pdisks so a single Teradata Database vNode has a raw total pdisk size of $3 * \text{pdiskSizeGB}$. If `pdiskSizeGB` = 100, then $3 * 100 = 300$ GBytes of raw pdisk on a single Teradata Database vNode. Typically, the `pdiskSizeGB` property is set between 500 GB and 2 TB. Larger pdisk sizes reduce performance.

Sysinit and DIP (Database Initialization Program)

The virtual Teradata Database system, sysinit, and the database supporting infrastructure take approximately 30% of raw pdisk space leaving approximately 70% for customer data.

Fallback

All virtual Teradata Database systems have Fallback turned on. Fallback divides available space by a factor of 2.

Note:

Fallback should not be turned off. If your database goes down, Teradata Customer Support may not be able to assist in recovering your data.

Compression

All virtual Teradata Database systems have Compression turned on. A ratio of 2.5 is used for the compression calculation. Multiplying by 2.5 increases the available CDS.

CDS Formula

$$\text{CDS} = (\text{Number of Teradata Database TPA vNodes} * \text{Number of pdisks per TPA vNode} * \text{pdiskSizeGB} * \text{sysinit and DIP} * \text{Compression}) / \text{Fallback}$$

For example:

$$\text{CDS} = (\text{Number of Teradata Database TPA vNodes} * 3 * \text{pdiskSizeGB} * 0.7 * 2.5) / 2$$

Use the following formula by entering the number of Teradata Database vNodes and the virtual disk size to determine the total size of the virtual Teradata Database system:

Using the above formula, the following examples show how you can size according to the number of vNodes.

Example 1

Assume a system comprised of 4 TPA virtual instances and a common properties `pdiskSizeGB = 500GB`

$$\text{CDS} = (4 * 3 * 500 * 0.7 * 2.5) / 2 = 5250 \text{ GB}$$
Example 2

A CDS of 20 TB requires a `pdiskSizeGB` setting of 1536 GB which is equal to 1.5TB. Use the CDS formula shown above to obtain the number of Teradata Database vNodes.

Number of Teradata Database vNodes = $(\text{CDS} * 2) / (3 * \text{pdiskSizeGB} * 0.7 * 2.5)$

Convert the CDS requested from TB to GB. For example, 20 TB = $1024 * 20 = 20480$ GB. Next, add the numbers into the above formula.

For example: *Number of Teradata Database vNodes* = $(20480 \text{ GB} * 2) / (3 * 1536 * 0.7 * 2.5) = 40960 / 8064 = 5.08$ Teradata Database vNodes

To validate your calculations, use the original formula as follows:

- $\text{CDS} = (\text{Number of Teradata Database vNodes} * 3 * \text{pdiskSizeGB} * 0.7 * 2.5) / 2$
- $\text{CDS} = (5.08 * 3 * 1536 * 0.7 * 2.5) / 2 = 20482 \text{ GB}$ which translates to $20482 / 1024 = 20 \text{ TB}$

Networking Considerations

Teradata Database on VMware supports local virtual switches so each ESXi host must have local virtual switches for the BYNET, Server Management and DSC network. The BYNET and DSC virtual switches must have maximum transmit unit (MTU) values of 9000 to achieve maximum performance. The BYNET MTU size in the operating system is automatically set to 9000.

If you are deploying a high-performance Teradata MPP production system, all virtual switches must be on their own physical network, connecting the ESXi hosts in the same way as a physical system. If you are deploying a low-performance development and test system, the virtual adapters can be placed on the same physical network. However, using an MTU value of 9000 may cause issues on subnets that are trying to use a different size MTU. Although performance is reduced, we recommend keeping the BYNET and DSC at an MTU value of 9000 and placing them on the same physical network.

All virtual nodes require static IP addresses.

Memory Considerations

CPU and memory are reserved for each virtual instance. A Teradata Database system is a distributed system and cannot be load balanced or the performance is reduced to the slowest virtual node. Each ESXi host requires CPU and memory to function, so an algorithm automatically attempts to ensure ESXi has enough to function. All systems are different, and at times the CPU and memory reservations set for the Teradata Database nodes can be too high for some ESXi hosts. If this occurs, some virtual nodes will not boot, and the vSphere Client interface displays errors to indicate which reservation is too high. To resolve this issue, you can set override values in the `common.IT.properties.json` properties file. For more information about using the following properties, see [Additional Properties for Customization](#).

- For memory reservation, set the `MemoryMBPerTPA` property to be lower than the automatically calculated value.

- For CPU reservation, set the `EsxiCPUreserved` property to be higher than the automatically calculated percentage.

The database image used by Teradata Database on VMware allows only 64GB of memory for a crash dump. Higher memory amounts will not allow for a complete crash dump. A crash dump is used for debugging issues, and debugging of larger memory dumps is not supported at this time.

Physical Storage Considerations

Become familiar with physical storage considerations before deploying Teradata Database on VMware.

For performance reasons, each Teradata Database system virtual disk should reside on a RAID-1 pair of physical disks. Common vSphere configurations utilize disk arrays, iSCSI, and other types of storage. Although these types of storage can be used, doing so may compromise performance, especially if other non-Teradata virtual machines are sharing the same storage configuration.

We assume you are using internal storage and each LUN/datastore is based on a RAID-1 drive pair. If you are using external storage, such as a disk array, consider the performance and data redundancy implications. The primary requirement is each TPA vNode must have at least three database system pdisks. By default, each pdisk resides on a separate datastore. However, if you want multiple pdisks to reside on a single datastore, you can set the `uniqueDisks` property in the `common.IT.properties.json` file to `FALSE` to apply an override. Setting it to false may be useful when you have only a single large datastore. Determine the performance and data redundancy implications when using different RAID configurations, external versus internal storage, or if you have multiple pdisks on the same datastore versus having each pdisk reside on its own datastore.

For information on how to obtain the scripts referenced below, see [Installation Components](#).

Configuration Script Type	Details
Low-Level LUN	<p>If you have not already configured the low-level LUN storage, you can download the following scripts to configure specific Dell and HP hardware:</p> <pre>.\dell.storage.configuration.ps1 .\hp.storage.configuration.ps1</pre> <p>These scripts create RAID-1 LUNs on the internal storage of the specific hardware. The scripts enable you to print and validate the settings of the already-existing Dell vdisks or HP logical drives based on recommended settings.</p> <p>If you are configuring storage not supported by these scripts, such as an external disk array, see your disk array documentation for information on how to configure the storage.</p>
vSphere Datastore	<p>If you have not already configured the datastores, you can download the following script to create datastores on a given ESXi host.</p> <ul style="list-style-type: none"> <code>createDatastores.ps1</code> <p>The script only creates datastores on storage devices that are not already associated with another</p>

Configuration Script Type	Details
	datastore. If the ESXi host is connected to more than one storage adapter, the script asks you to specify which adapter to use.

Dell-Specific RAID Settings

Teradata is a distributed database system and performance is better when the database system data drives are spread across multiple RAID-1 drive pairs. Each vNode/TPA instance requires 3 vdisks/datastores. If deploying a 4 vNode/TPA, a total of 24 internal drives are configured as RAID-1 pairs, resulting in 12 LUNs. Each one has a single datastore created using the entire LUN size. When the vNode/TPA instances are deployed, a single Teradata Database pdisk is created inside each datastore utilizing all of the datastore space.

The bundle of scripts help you configure the internal RAID storage to Teradata specifications. A second script is provided so you can create the datastores for each ESXi host if needed. The scripts that Teradata provides have been tested on Dell R720xd, R730xd and HP Gen9 pNodes. If you do not have these pNode types, the following are the Dell-specific RAID settings. It will be your responsibility to ensure the settings are correct as vendors use different setting names.

RAID-1 Settings

Setting Name	Recommended Setting
Read Policy	No Read Ahead
Write Policy	Write Back
Disk Cache Policy	Disabled
Stripe Element Size	64 KB

Configuring Internal Storage for a Dell System

1. Before running the `dell.storage.configuration.ps1` script, which configures the internal storage, you must configure the iDRAC on the Dell system. See the documentation that is specific to your Dell server.
2. Ensure the server is running firmware at the following minimum versions or later.

Node	Bios	iDRAC	USC	Lifecycle Controller	IDSDM
R720XD	2.0.19	1.57.57	1.4.0.128	Not applicable	Not applicable
R730XD	1.2.10	2.10.10.10	Not applicable	2.10.10.10	0.15

3. Configure the iDRAC.

The iDRAC login and password you use must have privileges for the script to run correctly or you can change the default password for the login used to connect to the iDRAC.

4. Install remote RACADM on the PC where the script is run.

For more information, search the Dell TechCenter for RACADM Command Line Interface for DRAC.

5. Run the `dell.storage.configuration.ps1` script.

Note:

The script may reboot the server that is being configured.

The script creates RAID-1 virtual disks on the Dell internal storage and can also be used to print and validate the settings of the existing storage configuration and Dell virtual disks based on recommended settings.

Configuring Internal Storage for an HP System

1. Before running the `hp.storage.configuration.ps1` script which configures the internal storage, ensure the ProLiant DL380 Gen9 server is running firmware at the following minimum versions or later. See the documentation that is specific to your HP system if you need to upgrade to these versions.

HPSSACLI	SOULAPI	PowerCLI 5.5
2.20.11.0	8.2.11.0	Release 2 or later

2. Run the `hp.storage.configuration.ps1` script.

Note:

The script may reboot the server that is being configured.

The script creates RAID-1 logical drives on the HP internal storage and can also be used to print and validate the settings of the existing HP logical drives based on recommended settings.

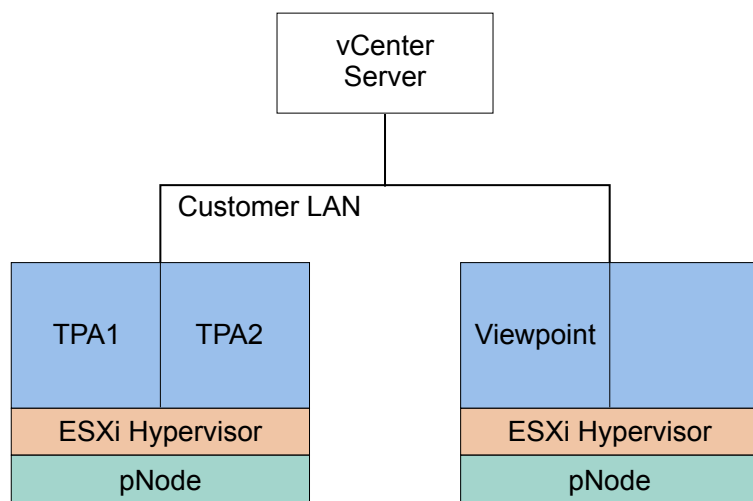
Sample Configurations

You can deploy a wide range of configurations depending on the type of system you need. A development and test system is typically 1, 2, or 4 vNodes, while a high-performance production system can have up to 128 vNodes, depending on your requirements and the system performance you want to achieve. If you do not get the results you expect, contact Teradata Professional Services to schedule an appointment.

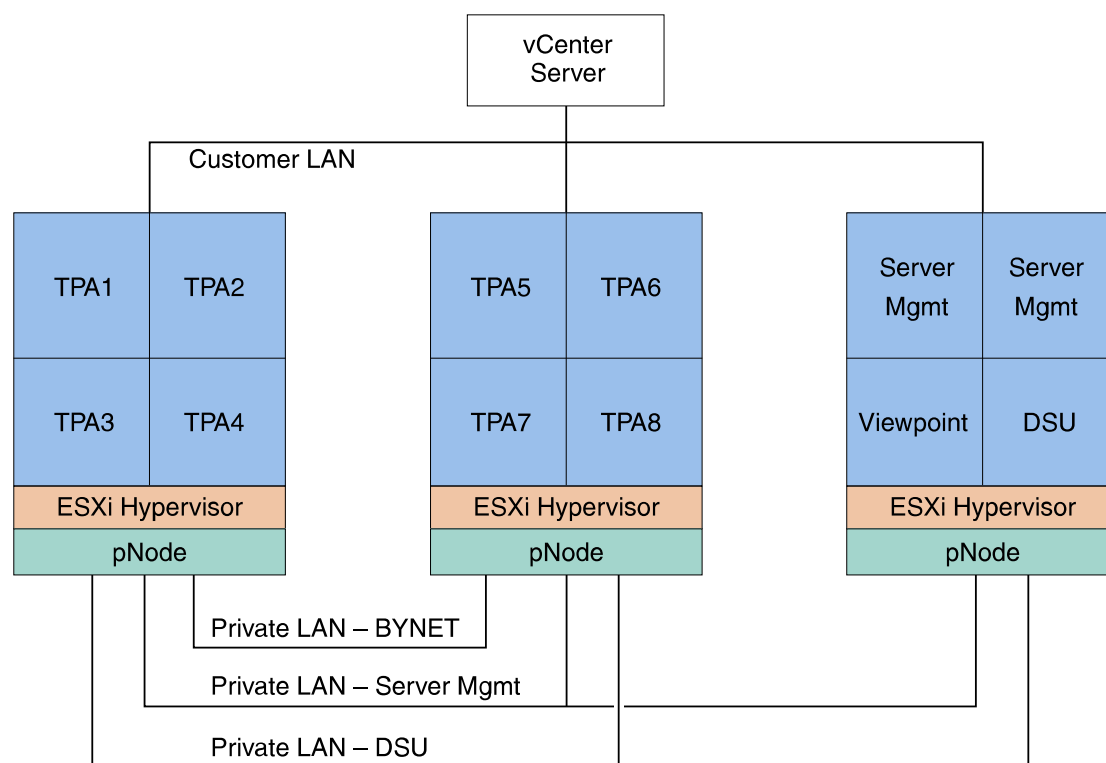
Note:

For each licensed physical core you purchase, you get two virtual cores.

The following graphic shows a sample configuration with two pNodes and TPAs representing the vNodes.



The following graphic shows a sample configuration with three pNodes and TPAs representing the vNodes.



Single vNode Guidelines

The following table lists guidelines for a sample single vNode development/test or production configuration.

System Type	vCPU	Memory	Storage	Separate Physical Networks
Development/Test	2 to 4 virtual cores	2 GB minimum per virtual core	3 datastores	BYNET network runs in loopback so a virtual network is not required for BYNET.

System Type	vCPU	Memory	Storage	Separate Physical Networks
Production	6 to 12 virtual cores	2 GB minimum per virtual core	3 datastores	Recommend using separate physical networks to ensure high performance.

Two vNode Guidelines

The following table lists guidelines for a sample two vNode development/test or production configuration.

System Type	vCPU	Memory	Storage	Separate Physical Networks
Development/Test	4 to 24 virtual cores	2 GB minimum per virtual core	6 datastores	<ul style="list-style-type: none"> • 1 public • 1 BYNET with 2 Ethernet networks for redundancy • 1 Server Management VM • 1 DSC
Production	12 to 24 virtual cores	2 GB minimum per virtual core	6 datastores	<ul style="list-style-type: none"> • 1 public • 1 BYNET with 2 Ethernet networks for redundancy • 1 Server Management VM • 1 DSC

Sixteen vNode Guidelines

The following table lists guidelines for a sample sixteen vNode production configuration.

System Type	vCPU	Memory	Storage	Separate Physical Networks
Production	96 to 192 virtual cores	384 GB or more	48 datastores	<ul style="list-style-type: none"> • 1 public • 2 BYNET for redundancy • 2 for Server Management (CMIC) redundancy • 1 DSC

Thirty-Two vNode Guidelines

The following table lists guidelines for a sample thirty-two vNode production configuration.

System Type	vCPU	Memory	Storage	Separate Physical Networks
Production	192 to 384 virtual cores	768 GB or more	96 datastores	<ul style="list-style-type: none"> • 1 public • 2 BYNET for redundancy

System Type	vCPU	Memory	Storage	Separate Physical Networks
				<ul style="list-style-type: none">• 2 for Server Management (CMIC) redundancy• 1 DSC

CHAPTER 2

Preparing for Installation

Installation Components

Teradata Database on VMware installation components consist of templates, property files, text files, and a deployment executable file.

- Required templates contain the Teradata Database and underlying operating system.
- Optional templates contain Viewpoint and its underlying operating system, DSC, Ecosystem Manager, and Server Management.
- Templates are ready to use and include defaults for disk space and configuration, I/O, network connections, AMPs, and memory. By default, there are 12 AMPs per node, managing 12 pdisks. If the number of vCPU allocated to each node is less than 12, only 6 TPA AMPs per node can be deployed instead of 12.
- The properties files define configuration settings for the overall Teradata Database on VMware environment and the specific virtual machines.
- An executable file deploys the Teradata VM based on the configuration information in the property files.

Note:

After the database is deployed, the only way to change settings is to power on the system, run the **removevms** command, and run the **deploy** command again.

- Text files are used in time zone settings.

To download the licensed software, use Teradata Electronic Software Distribution (ESD). For more information, see the *Electronic Software Distribution (ESD) Guide*.

Templates

You will use Teradata Database on VMware templates to create a VM instance.

When you download these templates, you can put them in the vCenter or in a local folder on your desktop PC. It is preferable to deploy your templates from vCenter because it will be faster. If you deploy from your desktop PC you will be constrained by the connection to your data center.

The download file names listed below are appended with 14 numbers, representing the year (4 digits), month (2 digits), day (2 digits), hours (2 digits), minutes (2 digits), and seconds (2 digits) when the template was created by Teradata.

Type	Download File Name	Default Configuration of the Template
Teradata Database and Operating System	Teradata_Database_16.20.02.01_SLES11_SP3_on_VMware	<ul style="list-style-type: none">• 1 virtual core• 8 GB RAM• FSG cache setting: 90%
	Teradata_Database_15.10.07.01_SLES11_SP3_on_VMware	

Type	Download File Name	Default Configuration of the Template
		<ul style="list-style-type: none"> 187 GB operating system disk
Teradata Viewpoint and Operating System	Teradata_Viewpoint_16.20.00.00_SLES11_SP3_on_VMware	<ul style="list-style-type: none"> 1 virtual core 16 GB RAM 187 GB operating system disk 256 GB data disk
Data Stream Controller	Teradata_DSC_16.20.00.00_SLES11_SP3_on_VMware	<ul style="list-style-type: none"> 4 virtual cores 16 GB RAM 3 virtual disks: one 187 GB operating system disk and two 150 GB for the DSC repository.
Teradata Ecosystem Manager	Teradata_EM_16.20.00.00_SLES11_SP3_on_VMware	<ul style="list-style-type: none"> 4 virtual cores 32 GB RAM 3 virtual disks: one 187 GB operating system disk and two 150 GB for the EM repository.
Server Management	Teradata_CMIC_12.07.01.00_SLES11_SP3_on_VMware	<ul style="list-style-type: none"> 1 virtual core 16 GB RAM 26 GB virtual disk

Properties Files

Properties File Name	Description
<code>common.IT.properties.json</code>	<p>Defines the VMware vSphere configuration settings common across Teradata Database on VMware VMs. Configure the values in this file each time something in the virtual environment changes.</p> <p>If you have multiple VMs on one VMware vSphere server, the <code>common.IT.properties.json</code> properties file is unique for each VM.</p>
<code>node.IT.properties.json</code>	<p>Defines the specifications needed by the deployment executable file to install and configure the VMs. Define the values in this file for each deployment.</p>

Deployment Executable File

An executable file deploys the Teradata VM based on the configuration information in the property files.

Note:

If you receive an `ix` message when running this executable file, ignore the message as it should not cause an issue.

Script	Description
<code>tdc.deploy.exe</code>	Parses the <code>common.IT.properties.json</code> and <code>node.IT.properties.json</code> files to ensure all required values are present and correctly formatted, validates settings, and launches each subsequent command to deploy the components for the Teradata VM.

Installation Process

Prerequisite

You must have your Site ID to download and install Teradata Database on VMware and have VMware administrator privileges. For more information, see [VMware Administrator Privileges](#).

Decide if you want to install other Teradata applications. For information, see [Installing and Configuring Other Teradata Applications](#).

1. Prepare the host node, including configuring virtual disks and network connections, and the script to create the datastores.
2. Using the link and instructions provided by Teradata, download the Teradata Database on VMware installation components.
3. [If this is a new, single-server installation, install the vSphere Essentials kit.](#)
4. [If applicable, limit administration of the host server to certain users.](#)
5. [If this is a new installation, set PowerCLI execution privileges.](#)
6. Decide the location of the templates: vCenter or in the local system. You must prepare the templates before the initial deployment. See [Preparing the ova Templates](#) or [Preparing the Templates in the Local System](#). For the quickest deployment, choose the vCenter.
7. [If this is a new installation, or if your VMware environment has changed, edit the values in the `common.IT.properties.json` file.](#)
8. [Edit the `node.IT.properties.json` file with the values for the specific Teradata Virtual Machine installation.](#)
9. Deploy Teradata Database on VMware using one of the following methods:
 - [Deploying Teradata Database on VMware for Sites with Internet Access.](#)
 - [Deploying Teradata Database on VMware for Sites without Internet Access.](#)
10. [If you plan to use DSC, configure it.](#)
11. [Open the IP addresses in your firewall on the network segment you allocated for Server Management.](#)
12. [Use the Server Management portlet in Viewpoint to validate the Site ID and set up any proxies.](#)
13. [If necessary, start the database.](#)

14. [Confirm that the Teradata Database installed correctly.](#)
15. [Confirm that Viewpoint installed correctly if you installed it.](#)
16. [Confirm Server Management connectivity.](#)
17. [If you want the VM to communicate with a mainframe computer, establish the connection.](#)

vSphere

Before deploying any Teradata VM in a single-server environment, you must install the vSphere kit, which includes an operational vCenter Server. Installation and configuration of all VMware software, including vSphere and vCenter, is the responsibility of your VMware administrator. Teradata cannot support your VMware environment. Contact VMware support if you require more information.

Specifying Administrators of the Host Server

To allow only certain users to administer a Teradata VM host server in a shared virtual environment, you must add those users as administrators of the datacenter that you defined when adding the server to vCenter as part of preparing the node.

1. Open vSphere Client.
2. Log in to the vCenter Server associated with the Teradata VM host server.
3. In the tree view, click the branch for the datacenter containing the Teradata VM host server.
4. Click the **Permissions** tab.
5. In a blank area of the tab, right-click, then select **Add Permission**.
The **Assign Permissions** window appears.
6. Under **Assigned Role**, select **Administrator**.
7. Under **Users and Groups**, click **Add**.
The **Select Users and Groups** window appears.
8. From the **Domain** list, select the active directory where the accounts for the users who you want to designate as administrators exist.
9. In the list pane, select the applicable users or groups.
10. Click **Add**.
11. Click **OK**.
The **Select Users and Groups** window closes and the **Permissions** tab reflects the selected users or groups.

Running PowerCLI as Administrator

The PowerCLI shell must be run as a user with administrator privileges.

1. Navigate to **VMware vSphere PowerCLI** from your Desktop or the Start menu.
2. Right-click **VMware vSphere PowerCLI** and select **Run as administrator**.
3. If a **User Account Control** prompt appears, click **Accept**.

Setting PowerCLI Execution Privileges

If this is a new installation of PowerCLI, you must set the PowerCLI execution privileges to allow the unsigned but Teradata-certified deployment executable file to be run.

1. In a PowerCLI command window, run: **Set-ExecutionPolicy -ExecutionPolicy bypass**
2. If you are prompted to confirm the change, enter Y or A.
3. If you are running this command for the first time, restart the PowerCLI terminal.

Obtaining Teradata Licensing Information

Before deploying Teradata Database on VMware, you must obtain your Teradata licensing information and verify you have a sufficient quantity of physical cores available to deploy.

1. Refer to the email you received and record the EID and license period to use when you update the `common.IT.properties.json` properties file.
An *entitlement identifier* (EID) is a string corresponding with your Teradata license, which is valid for a specific period of time. You will use this licensing information in one of the properties files that you configure before deployment. See [The common.IT.properties.json File](#).
2. Log in to the Teradata EMS server to verify you have a sufficient quantity of physical cores available to deploy:
<https://slem.teradata.com/ecp>

Database Option Management

The Teradata private cloud offers the same features that come with an on-premises Teradata Database system with a couple of exceptions.

Teradata Database Features

Teradata Database on VMware offers many Teradata Database features including, but not limited to, those listed in this topic. Not all features listed below are included in all Teradata Database tiers. See [Teradata Database License Tiers](#). Although the package is included in the Teradata Database VM, you still need to install and configure it.

The following terms are used in the table below:

- *Automatic* indicates you do not have to install or configure the feature and can begin using the feature after a Teradata Database VM is launched.
- *Manual* indicates you must install and configure the feature using the Teradata Database documentation, similar to on-premises systems. Features that require Teradata Customer Support to enable are noted.

The following table does not include Teradata Database features that are enabled by default and are automatically installed and configured, such as Fallback. See [Fallback](#). Fallback is mandatory for all Teradata Database license tiers and should not be disabled, as it can potentially result in data loss.

For information on how to install and configure the listed features, see the **Documentation** column.

Database Feature	Description	Enabled by Default	Installation and Configuration	Documentation
Block-Level Compression	Stores data blocks in compressed format to save storage space and improve performance. <i>See Release Summary for Teradata Database 14.0.</i>	Yes Although this feature is disabled by default for on-premises, it is enabled by default for private cloud.	Automatic	<i>Teradata Database Administration</i>
Teradata Columnar	Provides the ability to partition a table or join index by column. <i>See Release Summary for Teradata Database 14.0.</i>	No	Automatic Must be configured.	<i>SQL Data Definition Language Syntax and Examples</i>
Teradata Intelligent Memory	Speeds query performance and maximizes system memory by ensuring the most frequently used data is kept in memory. <i>See Release Summary for Teradata Database 14.10.</i>	No Contact Teradata Customer Support to enable.	Manual Must be configured.	<ul style="list-style-type: none"> • <i>Utilities</i> • <i>Teradata Intelligent Memory</i> Orange Book available from https://access.teradata.com
Teradata Row-Level Security	If purchased, allows you to restrict data access by row in the Teradata Database. <i>See Release Summary for Teradata Database 14.0.</i>	No	Automatic	<i>Security Administration</i>
Teradata Secure Zones	Provides grouping of user and database hierarchies into separate database partitions with restriction of user access to one or more zones. <i>See Release Summary for Teradata Database 15.10.</i>	No	Automatic	<i>Security Administration</i>
Teradata Temporal	Provides built-in capabilities that are required in a temporal database management system.	No Enable at the time you deploy. This feature is available only for Base, Advanced, and Enterprise tiers.	Manual	<i>Temporal Table Support</i>

Fallback

Fallback is a Teradata Database feature that protects data in case of an AMP vproc failure. Fallback is especially useful in applications that require high availability. Fallback is enabled by default when you deploy Teradata Database on VMware. You cannot override the Fallback setting during or after table creation.

Notice:

Disabling Fallback can potentially result in data loss.

Fallback is automatic and transparent, protecting your data by storing a second copy of each row of a table on a different AMP in the same cluster. If an AMP fails, the system accesses the Fallback rows to meet requests. Fallback provides AMP fault tolerance at the table level. With Fallback tables, if one AMP fails, all data is still available. You can continue using Fallback tables without losing access to data. Fallback guarantees that the two copies of a row will always be on different AMPs. If either AMP fails, the alternate row is still available on the other AMP.

See Teradata Database documentation.

Editing Property Files

Edit the `common.IT.properties.json` file only once unless something in your virtual environment changes. Edit the `node.IT.properties.json` file before deploying each Teradata virtual machine.

1. In a text or JSON editor, open and update the properties file you need to edit.

The files are in `C:\myLocation\Teradata_Deployer\Properties`.

2. Save the file.

The common.IT.properties.json File

The `common.IT.properties.json` file defines the VMware vSphere configuration settings common across all Teradata Database on VMware deployments. Configure the settings in this file each time something in the virtual environment changes.

Unless otherwise indicated, all property settings are required.

Property Category	Properties	Description
Teradata System Name	<code>TDsystemname</code>	The name of the Teradata System.
Domain Setting	<code>domain</code>	The domain of the system being deployed which will be placed into the <code>/etc/hosts</code> file. Example: <code>domain:corp.company.com</code>
Public Virtual Switches	<code>public_vswitch</code>	The physical adapter with port group for the virtual network. The default setting is <code>VM Network</code> . Example: <code>public_vswitch:VM Network</code>

Property Category	Properties	Description
BYNET Virtual Switches	<code>byn_vswitch1</code> <code>byn_vswitch2</code>	The labels of the BYNET switches. The first is required in MPP systems. The second is for redundancy and performance in MPP systems. This setting is the name specified when you created the vSwitch in vSphere. The setting should be empty for single-node systems.
CMIC Virtual Switches	<code>cmic_vswitch1</code> <code>cmic_vswitch2</code>	The labels of the server management switches. These are only used in MPP systems with server management. The second is for redundancy and performance in MPP systems. This setting is the name specified when you created the vSwitch in vSphere.
DSC Virtual Switch	<code>dsu_vswitch</code>	The label of the DSC switch. This setting is the name specified when you created the vSwitch in vSphere.
Public Submask Setting	<code>public_submask</code>	The public submask name in dot-decimal notation. Example: <code>public_submask:192.168.253.0</code>
Gateway Setting	<code>gateway</code>	The gateway name or IP address. Example: <code>gateway:10.26.23.254</code>
Domain Name System Settings	<code>dns1</code> <code>dns2</code>	The DNS name or IP address. Examples: <code>dns1:192.168.0.256</code> [Optional] <code>dns2:192.168.1.256</code>
External NTP Server Settings	<code>ntp1</code> <code>ntp2</code>	The host name or IP address of the ntp1 server is required, however the ntp2 server is optional. Examples: <code>ntp1:time00.company.com</code> <code>ntp2:time01.company.com</code> You must configure the NTP servers if you plan to use the Temporal feature.
Time Zone Setting	<code>OSTimeZone</code>	[Optional] The time zone of the VM. Enter either a fixed time zone displacement from GMT or the time zone file name. See the file <code>LinuxTimeZoneStrings.txt</code> for the valid settings for <code>OSTimeZone</code> . If you are not enabling Temporal, the database time zone syncs with the operating system. The default time zone is US/Pacific. Examples: <code>OSTimeZone=GMT+11</code> <code>OSTimeZone=US/Eastern</code> For additional Teradata time zone information, see Temporal Time Zone Strings .

Property Category	Properties	Description
PDisk Datastore Match Criteria	<code>PDisk_Datastore_Match</code>	<p>Use this property to find the database datastores to attach data disks. The default setting is <code>_data</code>, which detects any datastores that contain <code>_data</code> in their name to be usable for database storage. Change this setting to match your datastores.</p> <p>Note:</p> <p>Ensure the value of PDisk Datastore Match Criteria does not match the pattern of the ESXI Datastore property in the <code>node.IT.properties.json</code> properties file by choosing different naming conventions for PDisk Datastore Match Criteria and ESXI Datastore.</p> <p>Example: If you name the pdisk datastores LUN_01 and LUN_02, and the OS datastore LUN_OS, and enter LUN as the value of PDisk_Datastore_Match, the scripts cannot differentiate internally between the pdisk datastores and the OS datastore. To resolve this issue, rename the OS datastore so LUN is not in the name.</p>
Physical Disk Settings	<code>pdiskSizeGB</code>	<p>The size of the Teradata Database system pdisks.</p> <p>Example:</p> <p><code>pdiskSizeGB:800</code></p>
Physical Disk Settings	<code>uniqueDisks</code>	<p>Knowledge of Teradata Database systems and vSphere storage set up is necessary to use this setting. Teradata recommends keeping the default setting to true. Do not change the default setting if you do not plan to use this feature.</p> <p>Change the setting to false if you want more than one Teradata Database system data disk to be placed into each Teradata Database datastore. The deployment executable file enumerates the datastores found on a given ESXi host using the <code>PDisk_Datastore_Match</code> expression. If set to false, the Teradata Database (TPA) nodes create pdisks without considering ownership when deploying on shared storage, SANs, or when there is not enough disks available. Database performance may be impacted. You can create as many Teradata Database system data disks of <code>pdiskSizeGB</code> that fit into the first one and then move to the next one.</p> <p>Example:</p> <p>If each of the enumerated datastores were 900GB and the <code>pdiskSizeGB</code> was set to 300GB, then during deployment three Teradata Database system data disks would be placed in each datastore until each vNode has three Teradata Database system data disks.</p>

Property Category	Properties	Description
System Setting	PhysicalCoresPerTPA	<p>Changes the number of physical cores assigned to each Teradata Database (TPA) VM. This does not affect the other node types.</p> <p>The total physical cores consumed by your Teradata entitlement (license) equals the PhysicalCoresPerTPA setting times the number of TPA nodes.</p>
Temporal Settings	Temporal TemporalDaylightSavings TemporalTimeDateWZControl TemporalTimeZoneHour TemporalTimeZoneMinute TemporalTimeZoneString	<p>If you plan to use Temporal, change the setting to true. If you do not plan to use it, accept the default of false. Refer to Temporal Settings.</p> <p>You must enable Temporal before deployment. If you did not enable it before deployment, you must redeploy the VM to enable it. If you do not want to redeploy the VM, contact your Teradata Sales representative to purchase a customer engagement.</p> <p>Note:</p> <p>If you plan to enable Temporal and restore data from a different Teradata Database, review Knowledge Article KAP1BACEE, <i>Migrating to TimeDateWZControl</i> first. This scenario can result in subtle data quality issues which are outlined in the Knowledge Article.</p> <p>Example:</p> <pre>Temporal:false TemporalDaylightSavings:false TemporalTimeDateWZControl:0 TemporalTimeZoneHour:0 TemporalTimeZoneMinute:0 TemporalTimeZoneString:America Pacific</pre>
Other Teradata Database Feature Settings	SecureZones RowLevelSecurity Columnar	<p>[Optional] Columnar, Row Level Security, and Secure Zones are Teradata Database features that can be enabled by setting it to true. If you do not plan to use a feature, accept the default of false. Columnar must be purchased to be enabled.</p> <p>Note:</p> <p>Secure Zones is supported on Teradata Database 15.10 and later.</p>
Site ID	SiteID	The Site ID representing this system. This is optional.
Mainframe Settings	MainframeLHID	<p>The logical Host ID for mainframe connectivity. The default is -1 to indicate the deployed system will not connect to a mainframe.</p> <p>Example:</p> <pre>MainframeLHID:-1</pre>

Property Category	Properties	Description
Folder Setting	Folder	Folder name where the VM is being deployed on the vSphere server.
IP Address Setting	IPAddressSetting	Indicates whether to use a static or dynamic IP address. For a two node MPP deployment, the IP address must be static.
License Settings	Tier	Database license tier that matches the software package you ordered. <ul style="list-style-type: none"> ET - Enterprise tier (default) AT - Advanced tier BT - Base tier See Teradata Database License Tiers .
	EntitlementID	Unique string of characters that enable you to use the licensed software. Obtain the EID from the email you received when you purchased the license.
	LicensePeriodInYears	Duration of license period, in years. <ul style="list-style-type: none"> 1 (default) 3 Obtain this integer from the email you received when you purchased the license. The license period is visible as a suffix to the name in the Product column after you log in to the Teradata EMS server.
	TeradataEmsURL	URL used to verify Teradata license, assuming you are deploying on a system with Internet access. The default is https://slem.teradata.com/ems . Change this setting only if your site uses a proxy server.

Sample common.IT.properties.json File

Use the following sample `common.IT.properties.json` file as a template for creating your own. Replace the sample data after the colon (:) with your own or see [Sample Property File Configurations](#). The properties with no sample data are optional while other properties provide default values.

```
{
  "TDsystemname": "lirampp",
  "domain": "",
  "public_vswitch": "VM Network",
  "byn_vswitch1": "byn_vswitch1",
  "byn_vswitch2": "byn_vswitch2",
  "cmic_vswitch1": "cmic_vswitch1",
  "cmic_vswitch2": "cmic_vswitch2",
  "dsu_vswitch": "dsu_vswitch",
  "public_submask": "",
  "gateway": "",
  "dns1": "",
  "dns2": "",
  "ntp1": "",
```

```

"ntp2": "",
"OSTimeZone": "US/Eastern",
"PDisk_Datastore_Match": "_data",
"pdiskSizeGB": "800",
"uniqueDisks": "TRUE",
"PhysicalCoresPerTPA": "6",
"Temporal": "FALSE",
"TemporalDaylightSavings": "FALSE",
"TemporalTimeDateWZControl": 0,
"TemporalTimeZoneHour": 0,
"TemporalTimeZoneMinute": 0,
"TemporalTimeZoneString": "America Pacific",
"SecureZones": "FALSE",
"RowLevelSecurity": "FALSE",
"Columnar": "FALSE",
"SiteID": "",
"MainframeLHID": "-1",
"Folder": "",
"IPAddressSetting": "",
"Tier": "",
"EntitlementID": "",
"LicensePeriodInYears": "",
"TeradataEmsURL": "https://slem.teradata.com/ems"
}

```

The node.IT.properties.json File

The `node.IT.properties.json` file contains the specifications needed by the deployment executable file to install and configure a Teradata Database or Teradata Viewpoint VM.

Set the values in the `node.IT.properties.json` file for each Teradata Database on VMware deployment.

Unless otherwise indicated, all property settings are required.

Property Category	Properties	Description
VMware Host Details	ESXiHost	Name of the VMware host. For example: <code>ESXiHost:esxhost01.corp.company.com</code>
ESXi Datastore	OS_Datastore	ESXi datastore where this VM instance will reside. For example: <code>esxhost01.datastore</code> This datastore is only used for the VM instances and for Teradata Database storage.

Note:

Ensure the value of **ESXI Datastore** does not match the pattern of the **PDisk Datastore Match Criteria** property in the `common.IT.properties.json` properties file. See the example in [The common.IT.properties.json File](#).

VM Name	vmName	Name of the Teradata Database, Teradata Viewpoint, DSC, Teradata Ecosystem Manager, and Server Management. Examples: <code>vmName: TD-DBS</code> <code>vmName: TD-VP</code> <code>vmName: TD-DSC</code>
---------	--------	---

Property Category	Properties	Description
		vmName: <i>TD-EM</i> vmName: <i>TD-CMIC</i>
Ethernet Network	eth0	Use only static IP4 addresses. If IPAddressSetting is dhcp, eth0 is not required.
VM Types to Deploy	vmType	Virtual machine type of the Teradata Database, Teradata Viewpoint, DSC, Teradata Ecosystem Manager, and Server Management image to deploy. Examples: vmType:tpa for a database VM vmType:vp for a Viewpoint VM vmType:dsu for a DSC VM vmType:em for an Ecosystem Manager VM vmType:cmic for a Server Management VM
Template File Path	Template	Refer to one of the following for the Windows file path to the template location: <ul style="list-style-type: none"> vCenter: Preparing the ova Templates Local system: Preparing the Templates in the Local System

Sample node.IT.properties.json File

Use the following sample node.IT.properties.json file as a template for creating your own. Replace the sample data after the colon (:) with your own or see [Sample Property File Configurations](#).

```
[
  {
    "ESXiHost": "esxi-1.company-domain.com",
    "OS_Datastore": "esxi-1.datastore",
    "vmName": "lirasmp1",
    "eth0": "xx.xx.xx.xx",
    "vmType": "tpa",
    "Template": "Teradata_Database_Template_Name"
  },
  {
    "ESXiHost": "esxi-1.company-domain.com",
    "OS_Datastore": "esxi-1.datastore",
    "vmName": "lirasmp2",
    "eth0": "xx.xx.xx.xx",
    "vmType": "tpa",
    "Template": "Teradata_Database_Template_Name"
  },
  {
    "ESXiHost": "esxi-1.company-domain.com",
    "OS_Datastore": "esxi-1.datastore",
    "vmName": "lirasmp3",
    "eth0": "xx.xx.xx.xx",
    "vmType": "tpa",
    "Template": "Teradata_Database_Template_Name"
  },
  {
    "ESXiHost": "esxi-1.company-domain.com",
    "OS_Datastore": "esxi-1.datastore",
    "vmName": "lirasmp4",
    "eth0": "xx.xx.xx.xx",
    "vmType": "tpa",
    "Template": "Teradata_Database_Template_Name"
  }
]
```

```

    },
    {
      "ESXiHost": "esxi-2.company-domain.com",
      "OS_Datastore": "esxi-2.datastore",
      "vmName": "liradsu",
      "eth0": "xx.xx.xx.xx",
      "vmType": "dsu",
      "Template": "Teradata_DSC_Template_Name"
    },
    {
      "ESXiHost": "esxi-2.company-domain.com",
      "OS_Datastore": "esxi-2.datastore",
      "vmName": "liravp",
      "eth0": "xx.xx.xx.xx",
      "vmType": "vp",
      "Template": "Teradata_Viewpoint_Template_Name"
    },
    {
      "ESXiHost": "esxi-2.company-domain.com",
      "OS_Datastore": "esxi-2.datastore",
      "vmName": "liraem",
      "eth0": "xx.xx.xx.xx",
      "vmType": "em",
      "Template": "Teradata_EM_Template_Name"
    },
    {
      "ESXiHost": "esxi-2.company-domain.com",
      "OS_Datastore": "esxi-2.datastore",
      "vmName": "liracmic",
      "eth0": "xx.xx.xx.xx",
      "vmType": "cmic",
      "Template": "Teradata_CMIC_Template_Name"
    }
  ]

```

Preparing the ova Templates

Prerequisite

Check that you have installed the VMware Client Integration Plug-in on your workstation. Access the [VMware Knowledge Base](#) and search for *Installing VMware Client Integration Plug-in*. If you have the plug-in installed, ensure it has been upgraded to the latest version.

Before initially deploying the VM, this procedure describes how to upload the .ova file to the vCenter and convert it to a template. Having the template reside on vCenter enables the VM to quickly deploy. Having the template reside on your local system takes the VM longer to deploy.

For best results, use either Internet Explorer 11 or Google Chrome as your browser.

1. Log in to the vSphere Client using your login credentials.
2. Under **Inventories**, select **Hosts and Clusters** to see all the ESXi hosts managed by the vCenter server.
3. Right-click the ESXi host name on which you want to clone the VM, and select **All vCenter Actions > Deploy OVF Template**.

If menus differ, look under **All vCenter Actions**.

4. From the **Deploy OVF Template** dialog box, do the following to begin the cloning process:
 - a) Under **Select source**, select **Local file**, then click **Browse** and go to the directory containing the .ova file that you want to clone.
For example, C:\powercli6\templates
 \SP3\Teradata_Database_16.20.xx.xx_SLES11_SP3_on_VMware_20170707125811.ova
 - b) Click **Next**.

- c) Under **Review details**, verify the .ova file, and click **Next**.
 - d) Under **Select name and folder**, select a folder or datacenter in your vCenter server in which to clone your VM, modify the name of the VM to make it unique (for example, `Teradata_Database_16.20.xx.xx_SLES11_SP3_on_VMware_20170707125811`, where 16.20.xx.xx represents the template version you are using), and click **Next**.
 - e) Under **Select storage**, select the datastore on which you want to clone the VM, then select **Thin Provision** from the **Select virtual disk format** menu if you want to speed up the clone time and save space in the datastore, and click **Next**.
Leave the **VM Storage Policy** as is.
 - f) Verify all information, and click **Finish** to clone the template.
5. From the vSphere Client, do the following to verify the VM was cloned.
 - a) Click the ESXi host name on which you cloned the VM.
 - b) Click the **Related Objects** tab.
 - c) Click **Virtual Machines**.
 - d) Under the **Name** column, verify the VM is in a powered off state and the status is normal.
 6. Under the **Name** column, right-click the VM you cloned, and select **All vCenter Actions > Convert to Template**.
The VM is converted to a template.
 7. From the vSphere Client, do the following to verify the VM was converted to a template.
 - a) Click the ESXi host name on which you cloned the VM.
 - b) Click the **Related Objects** tab.
 - c) Click **VM Templates**.
 - d) Under the **Name** column, verify the template appears.
 8. If you have a physical server with 2 to 7 pNodes, you must clone the template to another ESXi host.
 - a) From the **Related Objects**, click **VM Templates**.
 - b) Right-click the template name, and select **All vCenter Actions > Clone to Template**.
 - c) Under **Select a name and folder**, enter a name of the new template, then select a folder or datacenter in your vCenter server to put the new template, and click **Next**.
 - d) Under **Select a compute resource**, select the ESXi host and its datastore to host the template, and click **Next**.
 - e) Under **Select storage**, select the virtual disk format.
 - f) If you want to speed up the clone time and save space in the datastore, select **Thin Provision** from the **Select virtual disk format** menu, and click **Next**.
 - g) Under **Ready to complete**, verify all information, and click **Finish** to clone the template.

Following are examples of deploying VMs from vCenter for either of the latest Teradata Database versions and associated products. For the latest template version numbers, see [Templates](#).

The template name in the examples below is the VM name you modified in step 4d.

```
{
  "ESXiHost": "cs3097-05.labs.teradata.com",
  "Datastore": "cs3097-05.datastore",
  "vmName": "cobra26",
  "eth0": "10.25.28.110",
  "vmType": "tpa",
  "Template": "Teradata_Database_16.20.xx.xx_SLES11_SP3_on_VMware_20170707235215"
}
```

```
{
  "ESXiHost": "cs3097-05.labs.teradata.com",
  "Datastore": "cs3097-05.datastore",
  "vmName": "cobra26",
}
```

```

"eth0": "10.25.28.110",
"vmType": "tpa",
"Template": "Teradata_Database_15.10.xx.xx_SLES11_SP3_on_VMware_20170707235215"
}

{
"ESXiHost": "cs3097-05.labs.teradata.com",
"Datastore": "cs3097-05.datastore",
"vmName": "cobra26",
"eth0": "10.25.28.110",
"vmType": "vp",
"Template": "Teradata_Viewpoint_16.20.xx.xx_SLES11_SP3_on_VMware_20170707235215"
}

{
"ESXiHost": "cs3097-05.labs.teradata.com",
"Datastore": "cs3097-05.datastore",
"vmName": "cobra26",
"eth0": "10.25.28.110",
"vmType": "cmic",
"Template": "Teradata_CMIC_12.07.xx.xx_SLES11_SP3_on_VMware_20170707235215"
}

{
"ESXiHost": "cs3097-05.labs.teradata.com",
"Datastore": "cs3097-05.datastore",
"vmName": "cobra26",
"eth0": "10.25.28.110",
"vmType": "dsu",
"Template": "Teradata_DSC_16.20.xx.xx_SLES11_SP3_on_VMware_20170707235215"
}

{
"ESXiHost": "cs3097-05.labs.teradata.com",
"Datastore": "cs3097-05.datastore",
"vmName": "cobra26",
"eth0": "10.25.28.110",
"vmType": "em",
"Template": "Teradata_EM_16.20.xx.xx_SLES11_SP3_on_VMware_20170707235215"
}

```

Preparing the Templates in the Local System

Before initially deploying the VM, you must prepare the templates in the local system. Having the template reside on your local system takes the VM longer to deploy. Having the template reside on vCenter enables the VM to deploy quicker.

Following are examples of deploying a Viewpoint template to the local system using either an absolute path or relative path. For the latest template version numbers, see [Templates](#).

- Local deployment using absolute path:

C:\Templates

\Teradata_Viewpoint_16.20.xx.xx_SLES11_SP3_on_VMware_xxxxxxxxxxxxxx.ova

- Local deployment using relative path:

Teradata_Viewpoint_16.20.xx.xx_SLES11_SP3_on_VMware_xxxxxxxxxxxxxx.ova

The download file names listed above are appended with 14 numbers representing when the template was created by Teradata: the year (4 digits), month (2 digits), day (2 digits), hours (2 digits), minutes (2 digits), and seconds (2 digits).

Following is an example of deploying a Viewpoint virtual machine from your local machine using an absolute path:

```

{
"ESXiHost": "cs3097-05.labs.teradata.com",

```

```

"Datastore": "cs3097-05.datastore",
"vmName": "cobra26",
"eth0": "10.25.28.110",
"vmType": "vp",
"Template": "Teradata_Viewpoint_16.20.xx.xx_SLES11_SP3_on_VMware_XXXXXXXXXXXXX.o
va"
}

```

Temporal Settings

To use the Temporal option with Teradata Database on VMware, ensure you configure your system carefully to avoid issues with your data. For more information, see <http://www.teradata.com/Resources/White-Papers> and search for *Enabling the Temporal Data Warehouse*.

Note:

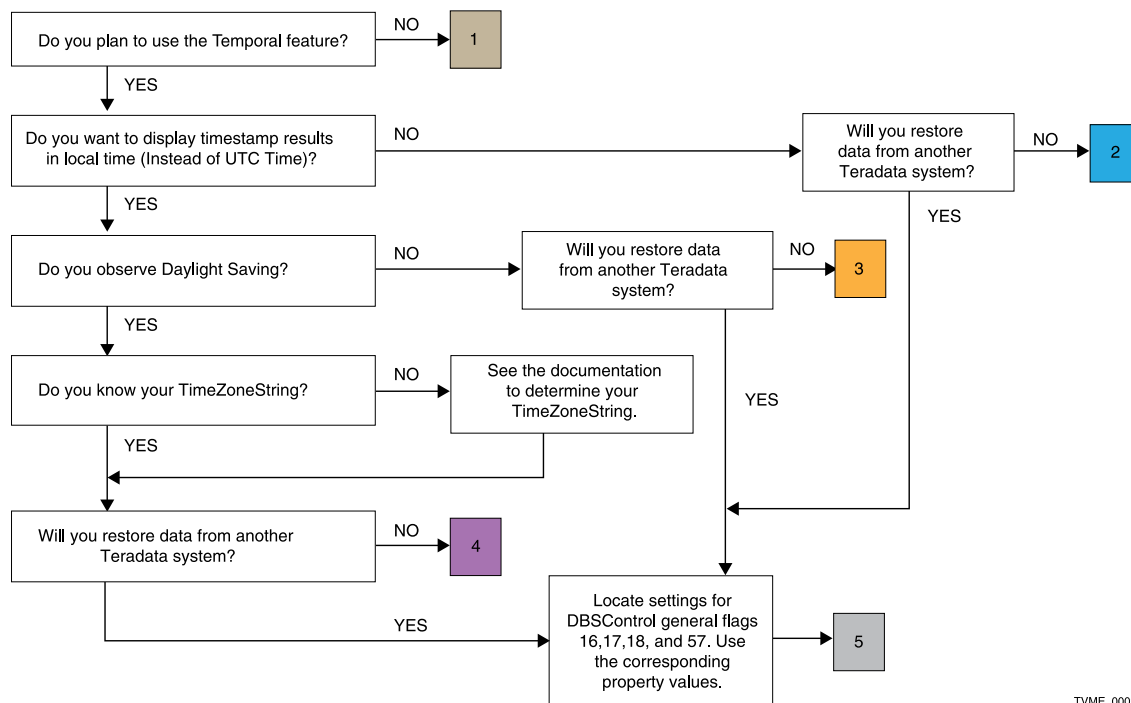
After you enable the Temporal option, you cannot turn it off, so learn about this option before you enable it. For more information, see *Temporal Table Support*.

To enable the Temporal option for a virtual machine, set the Temporal property value in the `node.IT.properties.json` file to **true**, and then configure the other related properties based on your preferred time options and whether you plan to restore data from another Teradata system.

To use the Temporal option, you must configure the NTP servers in the `common.IT.properties.json` file.

Contact your Teradata Database Administrator for the DBSControl Flag values for the time zone variables.

To determine your settings in the properties file, use the following diagram and table. If you do not know your TimeZoneString, see *Teradata Database Administration*.



The following information is important when enabling this feature:

- Temporal table support and Time Date with Zone Control by Database (TimeDateWZControl) are two different features. However, when enabling Temporal table support, Time Date with Zone Control by Database must also be enabled.
- If `DaylightSavings` is `true`, you must include a `TimeZoneString`.
- In the settings below, `TimeZoneHour = 5` and `TimeZoneMinute = 30` are examples. Enter the number of hours and minutes your installation is offset from GMT.
- See [Temporal Time Zone Strings](#) for the valid values for `TimeZoneString`.
- In the table settings below, `TimeZoneString = America Pacific` is an example. Enter the time zone for your system.
- In diagram scenario 5, you must copy the time zone settings from the DBSControl General Flags of the Teradata system from which you are restoring data.

Note:

Scenario 5 reflects six possible variations, described below as 5a, 5b, 5c, 5d, 5e, and 5f.

Diagram Scenario	Temporal Settings in the Property File	DBS Control Setting Applied As
1	Temporal:false TimeDateWZControl:0 (<i>Disabled</i>) DaylightSavings:false TimeZoneHour:0 TimeZoneMinute:0 TimeZoneString: <i>Not Set</i>	16. System TimeZone Hour:0 17. System TimeZone Minute:0 18. System TimeZone String: <i>Not Set</i> 57. TimeDateWZControl:0 (<i>Disabled</i>)
2	Temporal:true TimeDateWZControl:3 (<i>Local</i>) DaylightSavings:false TimeZoneHour:0 TimeZoneMinute:0 TimeZoneString: <i>Not Set</i>	16. System TimeZone Hour:0 17. System TimeZone Minute:0 18. System TimeZone String: <i>Not Set</i> 57. TimeDateWZControl:3 (<i>Local</i>)
3	Temporal:true TimeDateWZControl:3 (<i>Local</i>) DaylightSavings:false TimeZoneHour:5 (<i>Example</i>) TimeZoneMinute:30 (<i>Example</i>) TimeZoneString: <i>Not Set</i>	16. System TimeZone Hour:5 (<i>Example</i>) 17. System TimeZone Minute:0 18. System TimeZone String: <i>Not Set</i> 57. TimeDateWZControl:3 (<i>Local</i>)
4	Temporal:true TimeDateWZControl:3 (<i>Local</i>) DaylightSavings:true TimeZoneHour:0 TimeZoneMinute:0 TimeZoneString:America Pacific (<i>Example</i>)	16. System TimeZone Hour:0 17. System TimeZone Minute:0 18. System TimeZone String:America Pacific (<i>Example</i>) 57. TimeDateWZControl:3 (<i>Local</i>)
5a	Temporal data is stored in the Teradata file system in system local time. Daylight savings is observed. Temporal:true TimeDateWZControl:3 (<i>Local</i>) DaylightSavings:true	16. System TimeZone Hour:0 17. System TimeZone Minute:0 18. System TimeZone String:America Pacific (<i>Example</i>) 57. TimeDateWZControl:3 (<i>Local</i>)

Diagram Scenario	Temporal Settings in the Property File	DBS Control Setting Applied As
	TimeZoneHour:0 TimeZoneMinute:0 TimeZoneString:America Pacific (<i>Example</i>)	
5b	Temporal data is stored in the Teradata file system in UTC time. Daylight savings is observed. Temporal:true TimeDateWZControl:2 (<i>UTC</i>) DaylightSavings:true TimeZoneHour:0 TimeZoneMinute:0 TimeZoneString:America Pacific (<i>Example</i>)	16. System TimeZone Hour:0 17. System TimeZone Minute:0 18. System TimeZone String:America Pacific (<i>Example</i>) 57. TimeDateWZControl:2 (<i>UTC</i>)
5c	Temporal data is stored in the Teradata file system in system local time. Temporal data is displayed in UTC time. Daylight savings is not observed. Temporal:true TimeDateWZControl:3 (<i>Local</i>) DaylightSavings:false TimeZoneHour:0 TimeZoneMinute:0 TimeZoneString: <i>Not Set</i>	16. System TimeZone Hour:0 17. System TimeZone Minute:0 18. System TimeZone String: <i>Not Set</i> 57. TimeDateWZControl:3 (<i>Local</i>)
5d	Temporal data is stored in the Teradata file system in UTC time. Temporal data is displayed in UTC time. Daylight savings is not observed. Temporal:true TimeDateWZControl:2 (<i>UTC</i>) DaylightSavings:false TimeZoneHour:0 TimeZoneMinute:0 TimeZoneString: <i>Not Set</i>	16. System TimeZone Hour:0 17. System TimeZone Minute:0 18. System TimeZone String: <i>Not Set</i> 57. TimeDateWZControl:2 (<i>UTC</i>)
5e	Temporal data is stored in the Teradata file system in system local time. Daylight savings is not observed. Time offset from GMT is entered. Temporal:true TimeDateWZControl:3 (<i>Local</i>) DaylightSavings:false TimeZoneHour:5 (<i>Example</i>) TimeZoneMinute:30 (<i>Example</i>) TimeZoneString: <i>Not Set</i>	16. System TimeZone Hour:5 (<i>Example</i>) 17. System TimeZone Minute:30 (<i>Example</i>) 18. System TimeZone String: <i>Not Set</i> 57. TimeDateWZControl:3 (<i>Local</i>)

Diagram Scenario	Temporal Settings in the Property File	DBS Control Setting Applied As
5f	<p>Temporal data is stored in the Teradata file system in UTC time. Daylight savings is not observed. Time offset from GMT is entered.</p> <p>Temporal:true TimeDateWZControl:2 (<i>UTC</i>) DaylightSavings:false TimeZoneHour:5 (<i>Example</i>) TimeZoneMinute:30 (<i>Example</i>) TimeZoneString:<i>Not Set</i></p>	<p>16. System TimeZone Hour:5 (<i>Example</i>) 17. System TimeZone Minute:30 (<i>Example</i>) 18. System TimeZone String:<i>Not Set</i> 57. TimeDateWZControl:2 (<i>UTC</i>)</p>

CHAPTER 3

Installing and Configuring Teradata Database on VMware

Default Passwords

Notice:

For security purposes, we highly recommend default passwords be changed at the time you deploy Teradata Database on VMware.

VM Type	Account	User Name	Default Password	Description
TPA (Teradata Database)	Default OS User	tvme	iumb123	Default operating system user name and default password. Commands must be run with sudo.
	Root OS User	root	iumb123	Default operating system root user name and default password if the Security Hardening feature is disabled in the Teradata Database. Commands do not need to be run with sudo.
	Teradata Database User	dbc	dbc	Default Teradata Database user name and password.
EM (Ecosystem Manager)	Default OS User	tvme	iumb123	Default operating system user name and default password if the Security Hardening feature is enabled in the Teradata Database. Commands must be run with sudo.
	Root OS User	root	iumb123	Default operating system root user name and default password if the Security Hardening feature is disabled in the Teradata Database. Commands do not need to be run with sudo.
VP (Viewpoint)	Default OS User	tvme	iumb123	Default operating system user name and default password. Commands must be run with sudo.
	Root OS User	root	iumb123	Default operating system root user name and default password if the Security Hardening feature is

VM Type	Account	User Name	Default Password	Description
DSC				disabled in the Teradata Database. Commands do not need to be run with sudo.
	Viewpoint Database User	viewpoint	viewpoint	Default Viewpoint user name and password created on the database. Viewpoint logs into the database with these credentials.
	Viewpoint Admin User	admin	teradata	Default Viewpoint administrator user name and password.
	Default OS User	tvme	iumb123	Default operating system user name and default password. Commands must be run with sudo.
	Root OS User	root	iumb123	Default operating system root user name and default password if the Security Hardening feature is disabled in the Teradata Database. Commands do not need to be run with sudo.
	Admin Teradata User	dbc	dbc#Bar!	Default Teradata Administrative user.
	DSC Repository User	DSUADMIN	dsu#Bar!	Default Teradata Database user name and password. It is the same default user name and password for a superuser.
	DSC Repository User	bar	dsu#Bar!	Default user name and password for the DSC repository user. Used for Create, Read, Update and Delete (CRUD) operations on BAR.
CMIC (Server Management)	DSC Repository User	barbackup	dsu#Bar!	Default user name and password for the backup DSC repository user. Used for Create, Read, Update and Delete (CRUD) operations on BARBACKUP.
	DSC OS User	dscuser		Default operating system dscuser user name.
	Root OS User	root	iumb123	Operating system root user name and default password.
	CMIC OS User	cmic	smcmic	Operating system cmic user name and default password.
	Server Management Client Root User	root	iumb123	Server Management Client root user name and default password.

To update the passwords for the DSC Repository for metadata, see *Updating Passwords* in the *Data Stream Utility Installation, Configuration, and Upgrade Guide for Customers*.

Deploying Teradata Database on VMware for Sites with Internet Access

Prerequisite

Before starting this procedure, do the following:

- Ensure all required values in the properties files are present and correctly formatted as described in [The common.IT.properties.json File](#) and [The node.IT.properties.json File](#).
- Complete the steps described in [Obtaining Teradata Licensing Information](#).

Note:

Your deployment site must have access to the web-based Teradata EMS server for this procedure. If your site cannot access the Internet, see [Deploying Teradata Database on VMware for Sites without Internet Access](#).

1. Open a VMware vSphere PowerCLI shell version 5.5 or later.
2. Type the following command from the PowerCLI prompt to connect to the vCenter that manages the ESXi hosts that will be running the Teradata Database VMs:
`connect-VIServer -server vCenter.server.name`
3. Navigate to the directory containing the Teradata Database on VMware deployment executable file (`C:\myLocation\Teradata_Deployer\`).
4. [Optional] For troubleshooting purposes, make copies of the `common.IT.properties.json` and `node.IT.properties.json` properties files, label them according to the system to be deployed, and then save them.
5. Run `tdc.deploy.exe`, using the properties files originally used to deploy the VMs.
6. At the prompt, type `deploy`, and press **Enter**.
 - a) Select the Common Properties file, and press **Enter**.
 - b) Select the Node Properties file, and press **Enter**.

The executable file connects to the vCenter server and validates the information in the properties files. When validation is successful, the executable file deploys the selected templates, and configures the VMs based on the values in the properties files.

7. If a message warns you that running scripts is disabled, you must set the execution privileges, then proceed to the next step.
See [Setting PowerCLI Execution Privileges](#).
8. From the PowerCLI terminal, type `deploy`.
For a description of the actions this state (command) performs, see [PowerCLI Commands for Teradata Database on VMware](#).
9. Review the information and do one of the following:
 - If it is correct, press **y**.
 - If the information is incorrect, edit the properties files and re-run the deployment executable file.

If there are no errors, the VM deploys. The deployment executable file is re-entrant, meaning if errors occur, they can be fixed and the executable runs all states again. Action is only taken as needed.

Postrequisite

After the VM deploys, complete the applicable procedures under [Deployment Verification](#).

Deploying Teradata Database on VMware for Sites without Internet Access

Prerequisite

Before starting this procedure, do the following:

- Ensure all required values in the properties files are present and correctly formatted as described in [The common.IT.properties.json File](#) and [The node.IT.properties.json File](#).
- Complete the steps described in [Obtaining Teradata Licensing Information](#).

If your deployment site can access the web-based Teradata EMS server, licensing information is passed between your site and the server over the Internet automatically. If your site cannot access the Internet, use this procedure to convey licensing information between the two locations manually.

Note:

Some steps require a device with Internet access, as well as access to the Teradata EMS server.

1. Open a VMware vSphere PowerCLI shell version 5.5 or later.
2. Type the following command from the PowerCLI prompt to connect to the vCenter that manages the ESXi hosts that will be running the Teradata Database VMs:
`connect-VIServer -server vCenter.server.name`
3. Navigate to the directory containing the Teradata Database on VMware deployment executable file (C:\myLocation\Teradata_Deployer\).
4. [Optional] For troubleshooting purposes, make copies of the `common.IT.properties.json` and `node.IT.properties.json` properties files, label them according to the system to be deployed, and then save them.
5. Run `tdc.deploy.exe`, using the properties files originally used to deploy the VMs.
6. At the prompt, type `deploy`, and press **Enter**.

a) Select the Common Properties file, and press **Enter**.

b) Select the Node Properties file, and press **Enter**.

The executable file connects to the vCenter server and validates the information in the properties files. When validation is successful, the executable file deploys the selected templates, and configures the VMs based on the values in the properties files.

7. If a message warns you that running scripts is disabled, you must set the execution privileges, then proceed to the next step.

See [Setting PowerCLI Execution Privileges](#).

8. From the PowerCLI terminal, type **deploy**.

For a description of the actions this state (command) performs, see [PowerCLI Commands for Teradata Database on VMware](#).

9. Type Y when the following warning appears.

```

Failed connecting to the given Teradata EMS Server: https://
slem.teradata.com/ems
Warning: Failed connecting to the Teradata EMS Server. Is this a non-
internet connected site deployment?
[Y] Yes [N] No [?] Help (default is "N"):

```

10. Record the following values from the system details that appear in the PowerCLI terminal:

- **Package Type**
- **Activation Quantity**
Number of physical cores to be activated.
- **Client 1 Info**
Equivalent to **Locking Code** on the Teradata EMS server.
- Directory where the license file is placed after the activation on the EMS server (`C:\myLocation\Teradata_Deployer\telm`).

```

----System Details----
EntitlementId: 9d843a13-76fa-3e67-9f8a-1e41f3d1ad0a
Package Type: VMware Enterprise
Activation Quantity: 4
Client 1 Info: *1RD V5L3 RKL4 TRM5

Info: After the license has been generated, place the license file
<lserverc> in the following directory : C:\myLocation\Teradata_Deployer\telm
\ then re-run tdc.deploy.exe

```

11. Using a device with Internet access, activate the license on the Teradata EMS server.
- a) Using a device with Internet access, log in to the Teradata EMS server:
The URL is <https://slem.teradata.com/ecp>.
 - b) Click to expand either the **Products** or **Orders** section.
 - c) Click **Activate** for the target product license, complete the following fields, then click **Submit**:
 - **Quantity to Activate**: number of physical cores
 - **Locking Code**: **Client 1 Info** string from the PowerCLI terminal message on the deployment site
 - [Optional] **User Activation Data**
 - **Activator**

An **Account confirmed** message appears in the lower right corner.
 - d) Click **Next**.
The **Step 4 - Finish** screen displays a message that the activation is complete, and that the license was emailed to the activator.

The email displays the license string created for the activation, and includes an attached file, `license.zip`, that also lists the license string.
12. [Optional] Click **Download License File** to save a local copy of the file (`license.zip`).
13. Expand the `license.zip` file from the email or download.
You will use the resulting license file (`lserverc`) when you return to the deployment site.
14. Click **Done**.
In the **Products** and **Orders** sections of the home page, updated **Activated** and **Available** reflect the quantities of cores used and remaining.
15. Back on the deployment site, place the license file (`lserverc`) in the `telm` directory indicated earlier in this procedure (`C:\myLocation\Teradata_Deployer\telm`).

- From the PowerCLI terminal, select the **deploy** step and type Y when the following warning appears.

```
Cannot ping Teradata EMS Server
Warning: Cannot connect to the Teradata EMS Server. Is this a non-internet
connected site deployment?
```

- If the license does not pass validation, the following error appears.

```
Error: The license file c:\myLocation\Teradata_Deployer\telm\lservrc does
not belong to this configuration. Make sure you are choosing the correct
common and node property files. Or place the correct license file and try
again.
```

To fix the issues, check the properties files, verify the correct license file has been copied to the correct path you recorded earlier in this procedure, and then return to step 14.

If there are no errors, the VM deploys. The deployment executable file is re-entrant, meaning if errors occur, they can be fixed and the executable runs all states again. Action is taken only as needed.

Postrequisite

After the VM deploys, complete the applicable procedures under [Deployment Verification](#).

DSC Configuration

Before using DSC on Teradata Database on VMware, do the following:

- Verify the DSC vSwitch is using at least a 10 GB network adapter.
- Verify the Teradata Viewpoint vNode is deployed at the same time as DSC.
- Verify a backup location is established. For more information, see the *Data Stream Utility Installation, Configuration, and Upgrade Guide for Customers* and refer to Configuring Storage Devices and Ports.
- Ensure users in the Teradata Viewpoint role have been granted permission to use the **BAR Setup** portlet as they will be using the portlet to configure the BAR system.
- After DSC has been deployed, Configure the DSC settings. See [Configuring DSC Settings](#).

The TPA and DSC vNodes are preconfigured as media servers. We recommend using the media servers on the TPA vNodes to back up and restore the Teradata Database, and use the media server on the DSC vNode to back up and restore the DSC repository for metadata. For the default DSC credentials, see [Default Passwords](#).

Configuring DSC Settings

Contact your Teradata Viewpoint Administrator to ensure you have the appropriate permissions to configure DSC settings in Teradata Viewpoint.

- Add the systems by following the procedure *Configuring Portlet Software*, in the *Data Stream Utility Installation, Configuration, and Upgrade Guide for Customers*.

In the *Configuring a DSC* section, the Broker IP of the DSC server can be found in the `/etc/hosts` file in the DSC LAN section.

- The Broker Port is 61616
- The Broker Connectivity is TCP
- The DSC Server Name is 127.0.0.1.

SSL is not set up by default. Do not select **Enable SSL over JMS Communication** until it is configured.

In the *Adding or Editing a Teradata System or Node* section:

- The dsc_name is **127.0.0.1Repository**.
- 2. Add a backup solution.
For more information, see *Data Stream Utility Installation, Configuration, and Upgrade Guide for Customers*.
- 3. Add a target group by following the procedure *Adding or Copying a Target Group*, in the *Data Stream Utility Installation, Configuration, and Upgrade Guide for Customers*.
- 4. Remove IPv6 IP addresses from media servers.
If buttons in the portlet do not display properly, clear your browser cache and refresh your browser.
 - a) Open the **BAR Setup** portlet.
 - b) From the **Categories** list, click **Media Servers**.
 - c) From the **Media Servers** list, select each media server and delete the IPv6 IP addresses beginning with fe.

To ensure all traffic goes through the DSU network, remove all IP addresses except 39.42.xx.xxx.

 - d) Click **Apply**.

You have completed the configuration settings for DSC. For more information about the settings in the **BAR Setup** portlet, see *Configuring Using Portlet Software* in the *Data Stream Utility Installation, Configuration, and Upgrade Guide for Customers*.

You can run backup, analyze, and restore jobs using the **BAR Operations** portlet in Teradata Viewpoint. For more information, see the *Teradata Data Stream Architecture User Guide*.

SMWeb and ServiceConnect Configuration

After deploying a Server Management VM, you can enable remote configuration assistance from Teradata Support by setting up Teradata ServiceConnect. Teradata Support then uses ServiceConnect to remotely assist with additional configuration options, such as installation and configuration of a policy server. If this option does not display, it is not available at your site.

See [Testing Server Management](#) for information on opening an incident with Teradata Support and using ServiceConnect.

ServiceConnect IP Addresses


For Teradata ServiceConnect to function properly, the following IP addresses must be open in your firewall on the network segment you have allocated to the Server Management VM.

IP Address	ServiceConnect Component
153.65.20.101	serviceconnect.teradata.com
153.65.20.36	scremote1.teradata.com
153.65.20.170	scremote2.teradata.com
153.65.20.38	scremote3.teradata.com
153.65.20.39	scremote4.teradata.com
153.65.20.40	scremote5.teradata.com

IP Address	ServiceConnect Component
153.65.20.41	scremote6.teradata.com

Setting Up Teradata ServiceConnect

If you choose to enable remote configuration assistance from Teradata Support, configure Teradata ServiceConnect as the final step in deploying a Server Management VM.

1. Open an incident with Teradata Support to begin using ServiceConnect. See [Testing Server Management](#).
2. Log in to the Teradata Viewpoint portal with Administrator credentials.
3. Click , and select the **Server Management** portlet.
4. From the **Configure** list, click **ServiceConnect**.
5. Log in to Teradata ServiceConnect.
The Teradata ServiceConnect details appear. If the system was previously set up with a Site ID, the **SiteID** box is populated.
6. Click **Create Connection**.
The system creates a connection, configures devices, generates an Asset Baseline, and sends an alert.
7. [Optional] If you require outgoing connections to go through a proxy server, click **Advanced options** and do the following:

If you enable **Proxy Auto-Configuration**, you cannot enable the **HTTP Proxy** or **SOCKS Proxy**. However, you can complete the authentication fields for either if the `.pac` file points to a proxy server that requires this information.

If you have a `*.pac` file at a known URL, you can configure it, along with any authentication for the HTTP and SOCKS servers, if required.

Proxy Options	Description
Auto-Configuration	<ol style="list-style-type: none"> a. Under Proxy Auto-Configuration, select Enable if you have an automatic proxy configuration script. b. In the URL box, type the IP address of your proxy server. The format is <code>http://proxy server IP Address/*.pac file path</code>.
HTTP	<ol style="list-style-type: none"> a. Under HTTP Proxy, select Enable. b. In the Host IP Address box, type the IP address of the HTTP proxy host. The IP address must be a valid IPv4 or IPv6 address. If it is IPv4, it is pinged to ensure the connection is valid. c. In the Port box, type the port number for the HTTP proxy. d. If credential authentication is required, click Authenticate using the following information, and type the login credentials.
SOCKS	<ol style="list-style-type: none"> a. Under SOCKS Proxy, select Enable. b. In the Host IP Address box, type the name or address of the SOCKS proxy host. The IP address must be a valid IPv4 or IPv6 address. If it is IPv4, it is pinged to ensure the connection is valid.

Proxy Options	Description
	<ol style="list-style-type: none"> c. In the Port box, type the port number for the SOCKS proxy. d. If credential authentication is required, click Authenticate using the following information, and type the login credentials.
8.	Click Apply .
9.	<p>[Optional] From the Configure list, click Alerts to further configure the alerts.</p> <p>Action sets that you configured in the Alert Setup portlet are displayed in the Alert Actions list in the Server Management portlet.</p>
10.	Click Close .

Deployment Verification

After deploying a Teradata virtual machine, test the Teradata Database and, if applicable, DSC, Ecosystem Manager, Viewpoint, and Server Management.

Retain the log files to confirm your settings.

Starting the Database

The database starts automatically after deployment.

If the database does not start, start it manually: `/etc/init.d/tpa start`.

Logging On to the Database

After starting the database, log on. For more information, log in to <https://access.teradata.com> and search for

- Teradata Database single-node systems: Knowledge Article KAC13A25E
- Teradata Database MPP systems: Knowledge Article KAC13D39E

Notice:

We strongly recommend changing the database password immediately. For more information, log in to <https://access.teradata.com> and search for KAP23E402.

Testing the Database

After deploying the database, verify the database is accessible and responsive.

1. Start BTEQ.
No additional installation is required. BTEQ is installed on the Teradata Database (TPA) node for Teradata Database on VMware.
2. Using the default credentials, log on to the database.
3. Run **select * from dbc.dbcinfo** to see if the database is responding.

Sample result indicating response:

```
sel * from dbc.dbcinfo;
*** Query completed. 3 rows found. 2 columns returned.
*** Total elapsed time was 1 second.
```

InfoKey	InfoData
VERSION	16.20.xx.xx
RELEASE	16.20.xx.xx
LANGUAGE SUPPORT MODE	Standard

4. If the database does not respond, access the server through SSH.
5. If you cannot access the server, see the appropriate Knowledge Article.
For more information, log in to <https://access.teradata.com> and search for
 - Teradata Database single-node systems: Knowledge Article KAC13A25E
 - Teradata Database MPP systems: Knowledge Article KAC13D39E

If you are unable to resolve the issue, contact Teradata Customer Support.

Testing Viewpoint

After deploying a Viewpoint VM, test if the deployment was successful by adding portlets, confirming data displays, and confirming the system is healthy.

1. Log in to the Teradata Viewpoint portal.
 2. Click **Add Content**.
 3. Select the **System Health**, **Node Resources**, and the **Query Monitor** portlets, and click **Add**.
 4. Confirm each of the portlets display data.
It may take a few minutes for the data collectors to provide the data that displays in the portlets.
 5. Confirm the **System Health** portlet displays green to indicate the system is healthy and the deployment was successful.
 6. If Viewpoint does not respond, ensure you have the correct IP address and, if so, access the server through SSH.
 7. If you cannot access the server, see the appropriate Knowledge Article.
For more information, log in to <https://access.teradata.com> and search for
 - Teradata Database single-node systems: Knowledge Article KAC13A25E
 - Teradata Database MPP systems: Knowledge Article KAC13D39E
- If you are unable to resolve the issue, contact Teradata Customer Support.

Testing Ecosystem Manager

After deploying an Ecosystem Manager VM, you can verify that it is configured on the Viewpoint node.

1. Add the Ecosystem Manager portlet in Viewpoint.
2. In the Ecosystem Manager portlet click **Servers** and locate a row with the entry **datacenter**.
If you do not see a node you configured, you must redeploy.

Testing DSC

After deploying a DSC VM, you can verify the installation.

1. Refer to *Verifying Installation* in the *Data Stream Utility Installation, Configuration, and Upgrade Guide for Customers*.

Testing Server Management

After deploying Server Management, you must open a Teradata Support incident if you plan to use and need to configure Teradata ServiceConnect. This process can take several days to complete, so plan accordingly.

1. Log in to <https://access.teradata.com>.
2. Under **Service Request**, select **Incidents > Create**.
3. Select the **Site ID** from the menu.
4. At **Incident Type**, select **Other/Not Sure**.
5. At **Incident Severity**, select a severity.
For a list of severity definitions, select the question mark above the menu selection arrow. Press **Esc** to close the window.
6. In **Incident Synopsis**, type **Request to Complete CMIC Configuration and Test for Teradata Database on VMware** and include which tier you are using.
7. In **Incident Description**, repeat the synopsis, along with any additional information that is helpful.
8. At **Contact Information**, enter your name, email address, and telephone number.
9. Click **Submit**.
10. Monitor the incident.
This process can take several days to complete.
11. After Teradata Customer Support validates the connection, close the incident.

R for Data Analysis

The Teradata VM image includes packages allowing you to install and use R table operators for data analysis. The following components must be installed before you can use R functionality with Teradata Database:

- R interpreter
- Fortran compiler
- udfGPL library

The ExecR table operator is required and is used to execute R scripts. For more information, see [Creating the ExecR System Table Operator](#).

To apply innovative statistical techniques to analyze data stored in Teradata Database, install the R add-on packages from the Comprehensive R Archive Network (CRAN). After they are installed, a new library (pkg) can be used within an R script. For more information, see [Installing Optional R Add-On Packages](#).

For additional information about installing R components and packages and using R, see *SQL External Routine Programming*.

Verifying the Fortran Compiler Packages

Verify the VME ESXi TPA template has the Fortran compiler packages installed before using R functionality.

1. Display the Fortran packages that are installed.

```
rpm -qa | grep fortran
```

2. Check the following packages are installed:

- gcc-fortran
- gcc43-fortran
- libgfortran43

Installing the R Interpreter

Prerequisite

You must have root privileges to access and install the `.rpm`.

You must install the R interpreter before using R functionality.

1. Type the following command to install the R interpreter:

```
psh rpm -U /var/opt/teradata/extras/R/R-3.2.1-1.x86_64.rpm
```

udfGPL Library Installation

The udfGPL library is automatically installed as part of the Teradata Database on VMware operating system installation. The **teradata-udfGPL** package that matches your version of the Teradata Database system is installed.

TDR is the R package interface between R and Teradata Database. Both TDR and the udfGPL library are included in the **teradata-udfGPL** package. Each version of the Teradata Database system has a compatible version of this package.

Upgrades for this package are included in the operating system upgrade bundle. For more information, see [Obtaining Software Bundles for Upgrade](#).

Creating the ExecR System Table Operator

The ExecR table operator is required and is used to execute R scripts.

1. Run the optional DipRTblOp DIP script to create the ExecR table operator.

Following is an example of how to run the DipRTblOp script from a Teradata node:

```
#cnstern 6
Input Supervisor Command:
> start dip
Started 'dip' in window 1
Input Supervisor Command:
> ^C -- <control C>
#cnstern 1
Attempting to connect to CNS...Completed
Type the password for user DBC or press the Enter key to quit:
```

```

> XXX
***Logon successfully completed.
Select one of the following DIP SQL scripts to execute:
(Press the Enter key to quit)
...
40. DIPRTBLOP - R Table Operator
> 40
Executing DIPRTBLOP
Please wait...
DIPRTBLOP is complete
Please review the results in /var/opt/teradata/tdtemp/dip40.txt on node 1-1
Would you like to execute another DIP script (Y/N)?
> N
Exiting DIP...

```

Installing Optional R Add-On Packages

To apply innovative statistical techniques to analyze data stored in Teradata Database, you have the option to install R add-on packages from Comprehensive R Archive Network (CRAN). After they are installed, a new library called `pkg` can be used within an R script.

1. Go to <http://cran.us.r-project.org/> to download the R add-on package from CRAN.
2. Put the downloaded R add-on package into the `/tmp` directory on the primary (PDN) node.
3. From the `/tmp` directory, run the `td_installRaddon` script.
`/opt/teradata/PUTTools/misc/td_RTblop/td_installRaddon pkgname`
 The script wraps the file downloaded from the CRAN website into a PUT-installable `.rpm` file and places the `.rpm` file in the current working directory which is `/tmp`.
4. Install the `.rpm` on all nodes using PUT or manually using `rpm` commands.
5. Copy the `rpm` to all nodes.
 For MPP installations, put the package in the same common location on all nodes.
6. Run one of the following commands:
 - Single-node system: `rpm -ivh packagename.rpm`
 - MPP system: `psh rpm -ivh directory/packagename.rpm`
7. Using the R console, check if the package was installed correctly.

Connecting with a Mainframe Computer

For more information on mainframe configuration, see *Teradata Director Program Reference* and *Teradata Tools and Utilities for IBM z/OS Installation Guide*.

1. In the `node.IT.properties.json` file, enter the TDP logical host ID in the LHID field.
2. Add the vNodes to the appropriate MVS etc. `hosts` file in the following format:
`HOST : ipaddr : vmnameNTCI n:: ::`

Note:

There is no space between the VM name and the NP name. There is a space between the second and third trailing colon.

<i>ipaddr</i>	IP address of the VM
<i>vm</i>	Name of the VM
NTCI <i>n</i> :: ::	Representation of an Teradata network processor (NP) name

The following is an example of a three vNode system:

```
HOST : 123.12.123.123 : VMNAMEntci1:: ::
HOST : 123.12.123.124 : VMNAMEntci2:: ::
HOST : 123.12.123.125 : VMNAMEntci3:: ::
```

3. Edit the TDP Parm file to add the NP information.

The following is the syntax of a three vNode system:

```
CONFIG NP DATABASE vmname
CONFIG NP LHID logical host id
START NP1
START NP2
START NP3
```

4. Ping the VM from the mainframe to confirm the deployment using the following syntax:

For a single-node system:

```
tso ping vmname
```

For a MPP system, ping the individual nodes:

```
tso ping vmname1
```

Connecting with a Mainframe Computer after Installation

If you have already deployed a Teradata VM, you can execute a script to connect with a mainframe computer.

1. Execute the `configureTCHN.sh` script on the deployed VM.

```
sh /root/tvme/configureTCHN.sh tdpid=LHID
```

where *LHID* is the TDP logical host ID.

CHAPTER 4

Installing and Configuring Other Teradata Applications

Installing and Configuring Teradata QueryGrid 1.0

Teradata QueryGrid packages must be acquired separately.

1. Obtain Teradata QueryGrid using one of the following methods:
 - Contact your Teradata account executive.
 - Contact Teradata directly:
<https://www.teradata.com/contact/>
866-548-8348 (U.S.)
+1 937-242-4030 (worldwide)
2. Install and configure the Teradata QueryGrid package according to the instructions in the QueryGrid installation guide that is appropriate to the connector you are using.
3. Follow additional configuration details if setting up Teradata QueryGrid to Hadoop using one of these connectors.
 - For Hadoop ECA connection to HDP, update the configuration file with `hive.security.authorization.sqlstd.confwhitelist.append` using the values `trh \.eca\..|oozie\.base\..|yarn\..*`
 - For connection to CDH, use `FQDN` in `yarn.resource`

Installing Teradata Distribution for Presto

Full installation documentation for Teradata Distribution for Presto can be found at <http://teradata.github.io/presto/docs/current/index.html>. To view installation instructions based on Hadoop distribution, click the link in the following table:

Hadoop Distribution	Installation Instructions
HDP or CDH	http://teradata.github.io/presto/docs/current/installation/installation-presto-admin.html

Teradata Premier Software Support is not included with Teradata Distribution for Presto and must be purchased separately. Community-driven customer support is available at <https://community.teradata.com/presto>.

Installing and Configuring Teradata Studio

1. Download the Teradata Studio package from <https://downloads.teradata.com>.
2. Install and configure the Teradata Studio package according to the *Teradata Studio and Studio Express Installation Guide*.

Installing and Configuring Teradata Tools and Utilities

You can install TTU on VMs running a supported version of Linux or Windows, or on another system running a supported operating system. For more information, see *Teradata Tools and Utilities Supported Platforms and Product Versions* for 15.10 or later at <http://www.info.teradata.com>.

To download TTU software upgrades, go to <https://access.teradata.com>.

1. Ensure the Teradata Database on VMware setup process deployed the files for installing TTU.
Linux and Windows versions of the files are placed in `/var/opt/teradata/TTU_pkgs`.
2. Copy the TTU packages to the appropriate Linux or Windows virtual or physical machine where the TTU software will be installed and used.
3. Install and configure the TTU package according to the instructions in the appropriate *Teradata Tools and Utilities Installation Guide* at <http://www.info.teradata.com>.

Removing VMs

Prerequisite

If the target VMs are installed on a system that is not connected to the Internet, you must revoke licenses before using this procedure. See [Revoking a License for Sites without Internet Access](#).

1. Open a VMware vSphere PowerCLI shell version 5.5 or later.
2. Type the following command from the PowerCLI prompt to connect to the vCenter that manages the ESXi hosts that are running the Teradata Database VMs:

```
connect-VIServer -server vCenter.server.name
```

3. Navigate to the directory containing the Teradata Database on VMware deployment executable file (C:\mylocation\Teradata_Deployer\).
4. Power on the VMs by running `tdc.deploy.exe` followed by the **poweron** command:

```
.\tdc.deploy.exe -commonITproperties common.IT.properties.json  
-nodeITproperties node.IT.properties.json poweron
```

5. Run `tdc.deploy.exe`, using the properties files originally used to deploy the VMs:

```
.\tdc.deploy.exe -commonITproperties common.IT.properties.json  
-nodeITproperties node.IT.properties.json
```

6. At the prompt, type `removevms`.
The `removevms` task performs two tasks in sequence before removing the VMs: `revoke_license` and `poweroff`. By default, the `revoke_license` task requires Internet access. If the target system is not connected to the Internet, an error will appear unless you have followed the steps in [Revoking a License for Sites without Internet Access](#).

Revoking a License for Sites with Internet Access

Note:

Your deployment site must have access to the web-based Teradata EMS server for this procedure. If your site cannot access the Internet, see [Revoking a License for Sites without Internet Access](#).

1. Open a VMware vSphere PowerCLI shell version 5.5 or later.
2. Type the following command from the PowerCLI prompt to connect to the vCenter that manages the ESXi hosts that are running the Teradata Database VMs:

```
connect-VIServer -server vCenter.server.name
```

3. Navigate to the directory containing the Teradata Database on VMware deployment executable file (C:\mylocation\Teradata_Deployer\).

4. Run `tdc.deploy.exe`, and provide answers to the prompts.
5. At the prompt, type `revoke_license`, and press **Enter**.
 - a) Select the Common Properties file, and press **Enter**.
 - b) Select the Node Properties file, and press **Enter**.
6. When prompted, enter the root password for the target system, and type Y at the following prompt.

```
Revocation of Teradata Database License!
Are you sure this is what you want to do?
[Y] Yes [N] No [?] Help (default is "N"):
```

The executable runs automatically. The license is re-credited to the product and revocation is now complete.

7. Log in to the Teradata EMS server to verify the **Activated** and **Available** quantities have been updated to reflect the change.

<https://slem.teradata.com/ecp>

Revoking a License for Sites without Internet Access

If your deployment site can access the web-based Teradata EMS server, licensing information is passed between your site and the server over the Internet automatically. If your site cannot access the Internet, use this procedure to convey licensing information between the two locations manually.

Note:

Some steps require a device with Internet access, as well as access to the Teradata EMS server.

1. Open a VMware vSphere PowerCLI shell version 5.5 or later.
2. Type the following command from the PowerCLI prompt to connect to the vCenter that manages the ESXi hosts that are running the Teradata Database VMs:

```
connect-VIServer -server vCenter.server.name
```

3. Navigate to the directory containing the Teradata Database on VMware deployment executable file (`C:\mylocation\Teradata_Deployer\`).
4. Run `tdc.deploy.exe`, and provide answers to the prompts.
5. At the prompt, type `revoke_license`, and press **Enter**.
 - a) Select the Common Properties file, and press **Enter**.
 - b) Select the Node Properties file, and press **Enter**.
6. When prompted, enter the root password for the target system, and type Y at the following prompt.

```
Revocation of Teradata Database License!
Are you sure this is what you want to do?
[Y] Yes [N] No [?] Help (default is "N"): Y
```

7. When the connection to the EMS server fails, type Y when the following warning appears on the screen.

```
Failed connecting to the given Teradata EMS Server: https://
slem.teradata.com/ems
Warning: Failed connecting to the Teradata EMS Server. Is this a non-
internet connected site deployment?
[Y] Yes [N] No [?] Help (default is "N"):
```


8. Record the following values from the system details that appear in the PowerCLI terminal to be used in a later step.

- **Package Type**
- **Client 1 Info**

Equivalent to **Locking Code** on the Teradata EMS server.

- Directory where the permission ticket will be placed after creating the revocation request on the Teradata EMS server (C:\myLocation\Teradata_Deployer\telm).

```
Info: For a non-internet connected site you will need the following information to generate a permission ticket from
https://slem.teradata.com/ecp
-----System Details-----
EntitlementId: 9e883e15-98ea-4e56-9f8b-1e52f5d1cd0b
Package Type: VMware Enterprise 1 Years
Client 1 Info: *1V2 2Q9W DDXM 98QX
```

```
Info: After the permission ticket has been generated,
place the permission ticket file (permissionTicket) in the following directory:
C:\myLocation\Teradata_Deployer\telm
then re-run tdc.deploy.exe.
```

9. Using a device with Internet access, log in to the Teradata EMS server:
The URL is <https://slem.teradata.com/ecp>.
10. Create the revocation request, download the permission ticket.
 - a) Click to expand **Activations**.
 - b) Click **Revoke** for the activation you want to revoke.
Make sure the values for **Locking Code** and **Package Type** for the activation match the **Client 1 Info** and **Package Type** values from the deployment site.
 - c) In the **Download Permission Ticket** tab, click **Download** to download the file.
You will use the `permissionTicket` file on the deployment site.
11. Back on the deployment site, place the `permissionTicket` file in the `telm` directory (C:\myLocation\Teradata_Deployer\telm).
12. Run `tdc.deploy.exe`, using the properties files originally used to deploy VMs.
13. At the prompt, type `revoke_license`, and press **Enter**.
 - a) Select the Common Properties file, and press **Enter**.
 - b) Select the Node Properties file, and press **Enter**.
14. When prompted, enter the root password for the target system, then type Y at the following prompt.

```
Revocation of Teradata Database License!
Are you sure this is what you want to do?
[Y] Yes [N] No [?] Help (default is "N"):
```

15. When the connection to the Teradata EMS server fails, type Y when the following output appears on the screen.

```
Failed connecting to the given Teradata EMS Server: https://
slem.teradata.com/ems
Warning: Failed connecting to the Teradata EMS Server. Is this a non-
internet connected site deployment?
[Y] Yes [N] No [?] Help (default is "N"):
```

The following information appears on the screen:

```
Info: Permission Ticket found. Continuing License Revocation for non-
internet connected site.
Info: Revocation has completed. Please upload your revocation ticket to
```

<https://slem.teradata.com/ecp> to have your license re-credited.
License revocation succeeds!

A revocation proof file (**revocationProof**), is generated in the **telm** directory. You will use the file on the Teradata EMS server.

If an error occurs, contact Teradata Customer Support.

16. Upload the revocation receipt to the Teradata EMS server.

a) Using a device with Internet access, log in to the Teradata EMS server:

The URL is <https://slem.teradata.com/ecp>.

b) In the **Revocation** screen, click the **Upload Revocation Proof** tab and upload the file.

c) Click **Done**.

In the **Activations** section, the row for the revoked activation no longer appears.

In the **Products** and **Orders** sections of the home page, updated **Activated** and **Available** quantities reflect the quantity of cores used and remaining.

Upgrade, Migration, and Backdown

CHAPTER 6

Upgrade Overview

Major and minor upgrades, reconfigurations, and expansions require a system redeployment. For information on how to upgrade the Teradata Database running in a virtual or public cloud environment, log on to <https://access.teradata.com> and search for KCS001779.

Before a minor or e-fix upgrade in a virtual or public cloud environment, the requirements related to the listed considerations are shown in the table.

Upgrade Consideration	Requirement
Bundle Download Mechanism	You obtain software upgrade bundles from Teradata Support, which uses Akamai for the download process. If you are a new Akamai user, you are prompted to complete additional steps related to Akamai setup when first downloading an upgrade bundle.
Operating System Updates	Because the operating system software bundle includes both important security updates and the latest version of the utility used to upgrade Teradata components (PUT), you must download this bundle whenever upgrading other Teradata components with the exception of Server Management, for which the required updates are included in the image itself.
Outage Preparation	When upgrading the operating system and Teradata components including Server Management, PUT does not set a maintenance window but does automatically reboot the system. Be sure to plan accordingly.
Data Backups	If performing a major or minor upgrade, use DSC to archive the existing Teradata Database. After the upgrade, use DSC to restore the archive. For more information, see DSC Configuration . You do not need to archive and restore data for maintenance and efix upgrades.
Cross-Tier Migration	You cannot migrate from the Teradata Database on VMware Base, Advanced, or Enterprise Tiers to the Teradata Database on VMware Developer Tier. They are separate products.

Obtaining a Teradata Change Control Number

For some software downloads from Teradata Support, you might need a Teradata Change Control Number.

1. Log on to <https://access.teradata.com>.
2. From the left navigation pane, click **Changes**.
3. Create a change control.

Obtaining Software Bundles for Upgrade

1. Log in to <https://access.teradata.com>.
2. Search for KAP1A730A in the search box and follow the instructions.
3. If you have more than one Customer Master Record (CMR), ensure you select the CMR for your Teradata on VMware deployment.
4. On the **Teradata Software Download** page, click **Cloud Software** in the upper left.
5. Download the latest bundles for your operating system, if applicable, and each additional component to upgrade.

Since the operating system bundle includes both important security updates and the latest version of PUT, you must separately upgrade the operating system whenever upgrading other Teradata components deployed in a virtual or public cloud environment, except Server Management.

Upgrading Teradata Components Other than Server Management

Prerequisite

Before starting, open a maintenance window to see the status of the Teradata components during the upgrade process, including data, summary alerts, and reports. For more information on using maintenance windows, see *Teradata Server Management Web Services User Guide*.

After initiation, the upgrade process is completely non-interactive. During the upgrade, PUT reboots the system.

When performing a major upgrade, you must instead redeploy the system. See [Installing and Configuring Teradata Database on VMware](#).

1. [Download the required upgrade bundles](#).
Because the operating system upgrade bundle includes both important security updates and the latest version of PUT, you must upgrade the operating system whenever upgrading other Teradata components in a virtual or public cloud environment.

2. Log on as user root to the system where the component you are upgrading is installed.
3. If the following directory does not exist, create it:
`/var/opt/teradata/swupgrade-source`
4. Transfer the downloaded upgrade bundles to `/var/opt/teradata/swupgrade-source`.
5. Change to the PUT bin directory:
`/opt/teradata/TDput/bin`

6. Manually install PUT on all the nodes.

For more information, log in to <https://access.teradata.com> and search for KCS004693.

7. Check the version of TDput you are running:

```
# rpm -qa | grep -i TDput
```

8. Run the **swupgrade -U** command:

- If the TDput version is 03.09.01.07 or higher, set an environmental variable with your dbc password and run the swupgrade with the -d option:

```
# export SWUPGRADEDBC='xxx'
# /opt/teradata/TDput/bin/swupgrade -U -d
```

Where *xxx* is your dbc password. If the password contains any special characters, you must use single quotes around your dbc password.

- If the TDput version is lower than 03.09.01.07, set your dbc password to **dbc** and run the command:

```
# /opt/teradata/TDput/bin/swupgrade -U
```

The upgrade process begins, displaying progress messages on screen until the system reboots.

9. Log back on to the system and run the command to display the log as the upgrade completes:

```
tail -f /var/opt/teradata/TDput/fileservice/logs/swupgrade.log
```

PUT displays the following to indicate upgrade completion:

```
Operation completed with exit status 0
```

```
::
```

```
::
```

```
Output for this script (swupgrade) can be found at /var/opt/teradata/TDput/
fileservice/logs/swupgrade.log
```

10. Press **Ctrl+c** to exit the **tail** command.
11. Confirm the upgrade version on the system.

Upgrading Server Management

Complete these steps to upgrade Server Management for a virtual or public cloud Teradata environment.

The Server Management image incorporates both operating system and application updates. So there is no need to upgrade the operating system separately before upgrading Server Management.

The upgrade process results in a reboot of Server Management.

When performing a major upgrade, you must instead redeploy the system. [Installing and Configuring Teradata Database on VMware](#)

1. [Download the required upgrade bundles.](#)

The upgrade bundle is a CMIC image (*cmicimage.cif*)

2. Log on as user root to the virtual or public cloud system where Teradata Viewpoint is installed.
3. Unzip the Server Management bundle to */var/opt/teradata/packages*.
4. Pass the update utility the CMIC primary IP address and the upgrade image details:

```
cmicimageupdate --cmic IPaddress --image cmicimage.version.cif
```

5. Enter **yes** to proceed with the Server Management upgrade.

The upgrade process runs, and Server Management reboots.

Teradata Database Migration

Migration means a migration of the data from one Teradata Database system to another.

To migrate your Teradata Database system, refer to the *Teradata Database Node Software Migration Guide Linux*. If you need help, contact Teradata Professional Services to schedule an appointment.

Teradata Database Backdown

Major and minor backdowns of Teradata Database are not supported.

For maintenance and efix backdowns, use SSH at the command line and performing a TPA reset.

Acronyms

Acronym	Definition
AID	Activation Identification (used for licensing)
AMP	Access Module Processor
BAR	Backup, Archive, and Restore
BTEQ	Basic Teradata Query
BYNET	Banyan Network (BYNET) Interconnect
CMIC	Computer Management Interface Controller
COP	Communications Processor
CRAN	Comprehensive R Archive Network
CRUD	Create, Read, Update, and Delete
DBC	Database Computer
DBS	Database System
DHCP	Dynamic Host Configuration Protocol
DIP	Database Initialization Program
DNS	Domain Name System
DSC	Teradata Data Stream Controller
DSU	Teradata Data Stream Utility
EID	Entitlement Identifier (used for licensing)
EMS	Teradata Entitlement Management System (used for licensing)
ESD	Electronic Software Distribution
ESXi	Elastic Sky X integrated
GMT	Greenwich Mean Time
HDD	High Density Drive
HPSSACLI	Hewlett Packard (Enterprise) Smart Storage Administrator Command-Line Interface
HT	Hyper-Threading
iDRAC	Integrated Dell Remote Access Controller

Acronym	Definition
IDSMD	Internal Dual SD Module
iSCSI	Internet Small Computer System Interface
JMS	Java Messaging Service
JSON	JavaScript Object Notation
LHID	Logical Host Identifier
LUN	Logical Unit Number
MPP	Massively Parallel Processing (Teradata Database multi-node system)
MTU	Maximum Transmit Unit
MVS	Multi-Value Compression
NP	Network Processor
PDE	Parallel Database Extensions
PDN	Primary Distribution Node
PUT	Teradata Parallel Upgrade Tool
RACADM	Remote Access Controller Admin
RADIUS	Remote Authentication Dial-In User Service
RAID	Redundant Array of Independent Disks
RID	Revocation Identifier (used for licensing)
SLES	SUSE Linux Enterprise Server
SOCKS	Socket Secure
SSH	Secure SHell
SSL	Secure Sockets Layer
TCP	Transmission Control Protocol
TDP	Teradata Director Program
TDR	Teradata R
TPA	Teradata Parallel Application
TTU	Teradata Tools and Utilities
USC	Unified Server Configurator
UTC	Coordinated Universal Time
VM	Virtual Machine
VP	Viewpoint

PowerCLI Commands for Teradata Database on VMware

PowerCLI Commands for Teradata Database on VMware

The table below describes the PowerCLI commands for Teradata Database on VMware that are referenced in this guide. Commands are sometimes referred to as states.

The **deploy** command runs a script that performs a full deployment. The script sequentially runs all of the commands listed except for **revoke_license**, **poweroff**, and **removevms**.

The following commands are laid out in the order they are to be executed. We recommend you follow the order in which the steps are listed. For troubleshooting purposes, most commands can be run independently if needed.

Command	Description
deploy	Deploys a single-node or MPP system using a <code>common.IT.properties.json</code> and <code>node.IT.properties.json</code> files.
confirmation	Displays a single-node or MPP system described in the properties files.
activate_license	Generates a license for the requested system.
clone	Clones new VMs from the template provided.
cpu_memory	Adjusts the CPU and memory on each VM.
public_adapters	Connects the public adapters to each VM.
bynet_adapters	Connects the BYNET adapters to each TPA VM for MPP systems.
cmic_adapters	Connects the CMIC adapters to each VM if necessary.
dsu_adapters	Connects the DSC adapters to each VM if necessary.
storage	Attaches the database virtual storage to each VM.
poweron	Powers up the VMs.
vmtools	Verifies the VMware tools are running.
copyfiles	Creates miscellaneous files and transfers them into each VM.
network	Configures the network for each VM.
reboot	Reboots all the VMs.
ntp	Configures NTP on all VMs.

Command	Description
configure	Runs Teradata PUT (TDput) which configures the Teradata system to initialize the Teradata Database.
mainframe	Sets TCHN to connect to the mainframe over TCP/IP.
dsu	Runs scripts to configure DSC.
viewpoint	Runs scripts to configure the Viewpoint server.
cmic	Runs scripts to configure the CMIC.
dbflags	Sets up Teradata Database flags for features such as Columnar, Temporal, and so on.
ecosystem	Configure Ecosystem Manager.
os_password	Changes the root passwords of VMs.
dbc_password	Changes the DBC password of the TPA VMs.
harden_security	Secures a deployed system.
validation	Runs validations only.
monitored_system	Adds one or more Teradata systems to the Viewpoint monitored systems list.
add_adapter	Adds a network adapter to VMs.
identify	Displays the System Info for licensing purposes.
revoke_license	Revokes existing license.
poweroff	Powers off all VMs.
removevms	[Use this command with caution] Revokes the license, powers off the systems, and removes the VMs.
fatalamprecovery	Determine AMPs in FATAL state and rebuild them.
nodefailurerecovery	Determine failure nodes and recover them.
enableBE2	Enable Boot Environment2 on TPA VMs.

Teradata Time Zones and Regions

Temporal Time Zone Strings

If you enabled the Temporal feature of Teradata Database and want to set the `TimeZoneString`, you can enter one of the following:

```
GMT
GMT+1
GMT+10
GMT+11
GMT+11:30
GMT+12
GMT+13
GMT+14
GMT+2
GMT+3
GMT+3:30
GMT+4
GMT+4:30
GMT+5
GMT+5:30
GMT+5:45
GMT+6
GMT+6:30
GMT+7
GMT+8
GMT+8:45
GMT+9
GMT+9:30
GMT-1
GMT-10
GMT-11
GMT-2
GMT-3
GMT-4
GMT-5
GMT-6
GMT-6:30
GMT-7
GMT-8
```

Temporal Regions

If you have enabled the Temporal feature of Teradata Database and have set **DaylightSavings** to true, you must enter one of the following time zone regions for your system (**TimeZoneString**):

```
Africa Egypt
Africa Morocco
Africa Namibia
America Alaska
America Aleutian
America Argentina
America Atlantic
America Brazil
America Central
America Chile
America Cuba
America Eastern
America Mountain
America Newfoundland
America Pacific
America Paraguay
America Uruguay
Asia Gaza
Asia Iran
Asia Iraq
Asia Irkutsk
Asia Israel
Asia Jordan
Asia Kamchatka
Asia Krasnoyarsk
Asia Lebanon
Asia Magadan
Asia Omsk
Asia Syria
Asia Vladivostok
Asia West Bank
Asia Yakutsk
Asia Yekaterinburg
Australia Central
Australia Eastern
Australia Western
Europe Central
Europe Eastern
Europe Kaliningrad
Europe Moscow
Europe Samara
Europe Western
Indian Mauritius
Mexico Central
Mexico Northwest
Mexico Pacific
Pacific New Zealand
Pacific Samoa
```

APPENDIX D

Troubleshooting Teradata Database on VMware

Node Failure Recovery

Node failure recovery depends on the type of failure. If the root disk fails, contact Teradata Customer Support. If you have lost a Pdsk, rebuild the AMP.

Rebuilding AMPs from Fallback

Prerequisite

Before you begin, assess if you can recover from fallback. If more than a single AMP in the same fallback cluster is down, you cannot use this procedure.

1. SSH into one of the nodes.
2. Run **vprocmanager**.
3. Run the command **status**.
4. Look for AMPs marked as **FATAL**** and check the column **Cluster/Host No.**

If two AMPs with the same **Cluster/Host No.** are Fatal, then recovery using fallback is impossible. In the following example, both AMPs in cluster 0, 3, 6, 9 are Fatal and are not recoverable.

SYSTEM NAME: MPP160								17/01/12		
14:40:21										
DBS LOGICAL CONFIGURATION										

Vproc Number Vproc	Rel. Vproc#	Node ID	Can Move	Crash Count	Vproc State	Config Status	Config Type	Cluster/ Host No.	Rcv Jrn1/ Host Type	TVS

0	1	1-01	Yes	0	FATAL**	Online	AMP	0	On	
28671										
1	2	1-01	Yes	0	FATAL**	Online	AMP	1	On	
28671										
2	3	1-01	Yes	0	FATAL**	Online	AMP	2	On	
28671										
3	4	1-01	Yes	0	FATAL**	Online	AMP	3	On	
28671										
4*	5	1-01	Yes	0	ONLINE	Online	AMP	4	On	
28670										

5	6	1-01	Yes	0	ONLINE	Online	AMP	5	On
28670									
6	7	1-01	Yes	0	ONLINE	Online	AMP	6	On
28670									
7	8	1-01	Yes	0	ONLINE	Online	AMP	7	On
28670									
8	9	1-01	Yes	0	ONLINE	Online	AMP	8	On
28669									
9	10	1-01	Yes	0	ONLINE	Online	AMP	9	On
28669									
10	11	1-01	Yes	0	ONLINE	Online	AMP	10	On
28669									
11	12	1-01	Yes	0	ONLINE	Online	AMP	11	On
28669									
12	1	1-02	Yes	0	FATAL**	Online	AMP	0	On
28668									
13	2	1-02	Yes	0	FATAL**	Online	AMP	3	On
28668									
14	3	1-02	Yes	0	FATAL**	Online	AMP	6	On
28668									
15	4	1-02	Yes	0	FATAL**	Online	AMP	9	On
28668									

5. If recovery is possible in your Vsphere client, delete the failed Pdisks that corresponds to the fatal AMPs.
6. Run `tdc.deploy.exe` with the storage step using the deployed system's `Node.IT.Properties` and `Common.IT.Properties`
This re-creates the removed Pdisks.

Note:

A copy of these two configs are located in `/root/tvme` on any of the nodes.

7. When the command finishes, run `tdc-rebuild` as the root user.
8. Enter your DBC account and password, then follow the prompts until the system is rebuilt.

Additional Properties for Customization

Additional properties can be added to the bottom of the `common.IT.properties.json` and `node.IT.properties.json` files for troubleshooting purposes.

Note:

This information is intended for advanced users only. Use these properties only when necessary or when instructed by Teradata as performance may be impacted.

`common.IT.properties.json`

Property Name	Setting	Description
<code>cmic_submask</code>	<i>Subnet mask address</i>	When deploying a Server Management vNode, the subnet mask for the Server Management network is automatically calculated. If there are issues with the automatic calculation, you can override the calculated subnet mask by setting this property. For example: 255.255.254.0. For assistance, contact your network administrator.

Property Name	Setting	Description
EsxiMemReservedMB	Integer	Changes the percentage of memory in MB reserved on the ESXi host. The ESXi host requires some memory for the ESXi Hypervisor. Different systems will have different requirements. The default is 0.05 of the total memory, rounded down to a multiple of 4.
EsxiCPUreserved	0.00 - 1.00	Changes the percentage of CPU reserved on the ESXi host. The ESXi host requires some CPU power for the ESXi Hypervisor. Different systems have different requirements. The default is 0.12.
MemoryMBPerTPA	Integer	Changes the amount of memory in MB assigned to each Teradata Database (TPA) VM. This does not affect the other node types.
NoLockdown	<ul style="list-style-type: none"> TRUE FALSE 	<p>Teradata recommends keeping this setting as FALSE which is the default setting.</p> <p>When set to TRUE, the VMs do not allow security changes to be performed and also disables the root account when using SSH.</p> <p>Notice: Setting this property to TRUE presents a high security risk. Use with caution.</p>

Crashdumps

Teradata Database on VMware currently supports 64 GB of reserved space on each virtual node for crashdumps, as required for support.

Depending on your workload and type of failure, a crashdump typically takes less than 3 GB of space. With 64 GB of reserved space, you should have enough space to support up to 7 crashdumps. However, in some circumstances crashdumps can be larger, such as full TPA crashdumps.

Deleting Datastore Files to Add Space

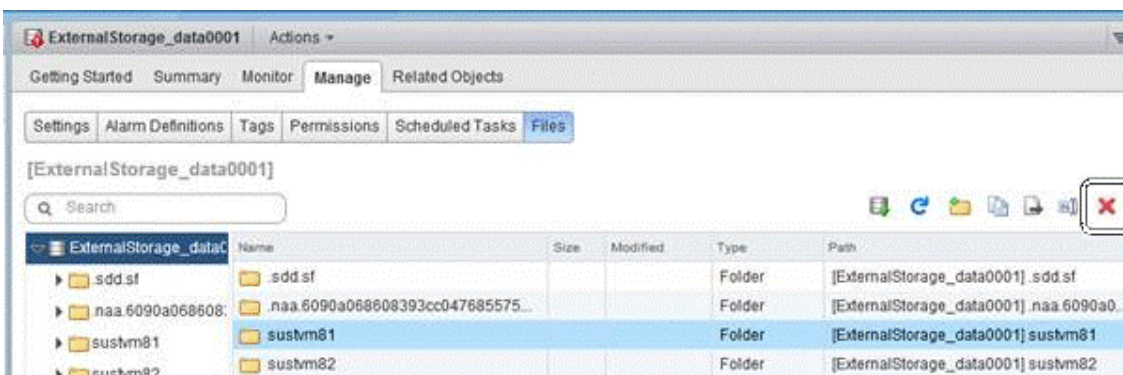
Depending on the type of storage used, there is a known VMware issue where free space on datastores does not return the original amount of space after you delete a VM. You can manually delete files from the datastore after you delete a VM.

Notice:

Do not delete files in the datastore that are not associated with the deleted VM. If you accidentally do, those files cannot be recovered which can be destructive to your system. You can use third party tools to help detect and delete orphaned VM files.

1. Open the vCenter Server or Virtual Infrastructure Client and log in.
2. Select a VM in your host inventory, located in the left panel.

3. Click the **Related Objects** tab and click **Datastores**.
4. Click a datastore from the list.
5. Click the **Manage** tab and click **Files**.
6. Highlight the files associated with the deleted VM, and click **X**, located in the upper right corner.



The free space on the associated datastore is returned to the original amount prior to deleting the VM.

Incorrect Password Error

When deploying a new VM, you may get the following password error after the VM receives power.

"ERROR! The deployed system is not using the default password given.
The given new password is either blank or incorrect!"

If you entered your correct password, check the logs for an entry similar to the following:

```
Invoke-VMScript : 11/16/2015 6:32:01 PM Invoke-VMScript Unable to connect to the remote server
```

The machine running the PowerCLI command and the ESXi host that contains the VMs may not be able to communicate with each other. Check your network configuration, and then contact your Cloud administrator for further assistance.

Multiple Port Groups with Same Name

When running TDVM scripts, you may encounter the following:

Error: Detected multiple portgroups named (vSwitchName) on esxi-host.company.com. Contact your VMWare administrator.

This can happen if you have two vSwitches with identical port group names within a single ESXi host. To resolve this issue, rename or remove the second port group.

PowerCLI Warnings

PowerCLI may send warnings when accessing the deployment executable file. Depending on the warning, it may not be relevant or cause issues. In vSphere PowerCLI 6.0 and later, the following warnings may appear repeatedly, but should not cause an issue.

WARNING: The version of VMware Tools on VM *version number* is out of date and may cause Invoke-VMScript to work improperly.

WARNING: Parameter 'VM' is obsolete. Passing multiple values to this parameter is obsolete.

Resolving BAR Setup Connection Warnings

If you get a `Connection to system unsuccessful` warning message when adding a Teradata Database system in the **BAR Setup** portlet, the DSC vNode may not be able to resolve the Teradata Database COP entries. To resolve this issue, you can verify the servers and domains configured in Teradata Viewpoint are also configured in the DSC vNode.

1. SSH into Teradata Viewpoint and extract the DNS servers and search domains.

- a) Extract the DNS servers:

```
# grep "NETCONFIG_DNS_STATIC_SERVERS" /etc/sysconfig/network/config
```

Sample output:

```
NETCONFIG_DNS_STATIC_SERVERS="153.64.251.200 153.65.8.10"
```

- b) Extract the DNS search domains:

```
# grep "NETCONFIG_DNS_STATIC_SEARCHLIST" /etc/sysconfig/network/config
```

Sample output:

```
NETCONFIG_DNS_STATIC_SEARCHLIST="td.teradata.com teradata.com"
```

2. SSH into the DSC vNode to check the DNS servers and search domains, and then add the servers and domains that are in Teradata Viewpoint.

- a) Extract the DNS servers.

```
# grep "NETCONFIG_DNS_STATIC_SERVERS" /etc/sysconfig/network/config
```

Sample output:

```
NETCONFIG_DNS_STATIC_SERVERS="153.64.251.200"
```

Notice if *153.65.8.10* is missing from Teradata Viewpoint.

- b) Add any missing servers.

```
# sed -i "s/^NETCONFIG_DNS_STATIC_SERVERS=.*$/  
NETCONFIG_DNS_STATIC_SERVERS=\"153.64.251.200 153.65.8.10\"/" /etc/  
sysconfig/network/config
```

- c) If you added a server, verify it is now there.

```
# grep "NETCONFIG_DNS_STATIC_SERVERS" /etc/sysconfig/network/config
```

Sample output:

```
NETCONFIG_DNS_STATIC_SERVERS="153.64.251.200 153.65.8.10"
```

- d) Extract the DNS search domains.

```
# grep "NETCONFIG_DNS_STATIC_SEARCHLIST" /etc/sysconfig/network/config
```

Sample output:

```
NETCONFIG_DNS_STATIC_SEARCHLIST="labs.teradata.com"
```

Notice if *td.teradata.com* and *teradata.com* are missing from Teradata Viewpoint.

- e) Add any missing search domains.

```
# sed -i "s/^NETCONFIG_DNS_STATIC_SEARCHLIST=.*$/
NETCONFIG_DNS_STATIC_SEARCHLIST=\"labs.teradata.com td.teradata.com
teradata.com\"/" /etc/sysconfig/network/config
```

- f) If you added a search domain, verify it is now there.

```
# grep "NETCONFIG_DNS_STATIC_SEARCHLIST" /etc/sysconfig/network/config
```

Sample output:

```
NETCONFIG_DNS_STATIC_SEARCHLIST="labs.teradata.com td.teradata.com
teradata.com"
```

- g) Apply the change.

```
/sbin/netconfig update -f
```

If the warning message continues, the DNS server may not contain any DNS record for the Teradata Database COP entries.

3. Extract the Teradata Database COP entries from the hosts file in Teradata Viewpoint and append them to the hosts file in the DSC vNode using the following syntax:

```
# grep TeradataSystemNamecop* /etc/hosts | ssh root@DSC_public_ip 'cat
>> /etc/hosts'
```

For example, if the *TeradataSystemName* is **system1** and the public IP for the DSC vNode is **10.25.23.170**, use the following syntax:

```
# grep system1cop* /etc/hosts | ssh root@10.25.23.170 'cat >> /etc/hosts'
```

License Troubleshooting

In addition to the topics in this section that will assist you in troubleshooting licensing issues, refer to the *Teradata Entitlement Management System (EMS) Customer User Guide* for a comprehensive list of EMS error messages.

Generating a New License for an Existing VM

If your system has an expired or a missing license file, use this procedure to bring your system into compliance.

1. Open a VMware vSphere PowerCLI shell version 5.5 or later.
2. Type the following command from the PowerCLI prompt to connect to the vCenter that manages the ESXi hosts that will be running the Teradata Database VMs:

```
connect-VIServer -server vCenter.server.name
```

3. Navigate to the directory containing the Teradata Database on VMware deployment executable file (C:\mylocation\Teradata_Deployer\).
4. Run **tdc.deploy.exe** interactively.

```
.\tdc.deploy.exe -commonITproperties common.IT.properties.json
-nodeITproperties node.IT.properties.json
```

5. From the PowerCLI terminal, type **activate_license** to generate a license for the existing VM.
For a description of the action this state (command) performs, see [PowerCLI Commands for Teradata Database on VMware](#).
6. Type **copyfiles** to transfer the configuration scripts into each VM.

7. If your system has an invalid license file, do the following:

Note:

The license verification cycle runs once every 24 hours from the time when the license was last checked and verified by Teradata and sends SLEM-NOTE messages to `/var/log/messages` that are related to licensing.

- a) Restart Teradata Database if any SLEM-NOTE indicates a missing license file.

Check with your Teradata Database Administrator to determine when to restart Teradata Database.

8. Follow the prompts to finish generating the new license.

Revoking and Updating a License for a VM

If you need to revoke a license from a deployed VM and update it with a new valid license, use this procedure. If additional physical cores are needed to properly license your system, contact your Teradata Account Team for assistance.

1. Open a VMware vSphere PowerCLI shell version 5.5 or later.
2. Type the following command from the PowerCLI prompt to connect to the vCenter that manages the ESXi hosts that will be running the Teradata Database VMs:

```
connect-VIServer -server vCenter.server.name
```

3. Navigate to the directory containing the Teradata Database on VMware deployment executable file (`C:\myLocation\Teradata_Deployer\`).
4. Run `tdc.deploy.exe` interactively.

```
.\tdc.deploy.exe -commonITproperties common.IT.properties.json  
-nodeITproperties node.IT.properties.json
```

5. From the PowerCLI terminal, type **revoke_license** to revoke the license for an existing (deployed) VM.

For a description of the action this state (command) performs, [PowerCLI Commands for Teradata Database on VMware](#).

6. Run `tdc.deploy.exe` interactively.

```
.\tdc.deploy.exe -commonITproperties common.IT.properties.json  
-nodeITproperties node.IT.properties.json
```

7. Type **activate_license** to generate a license for the existing VM.
8. Type **copyfiles** to transfer the configuration scripts into each VM.
9. Follow the prompts to finish revoking and updating the license.

Revoking a License for a Lost or Destroyed VM

You can revoke a license for a VM when you cannot access any of the TPA nodes or for a VM where the TPA nodes were deleted.

1. Navigate to the `Logs` directory.

```
C:\myLocation\Teradata_Deployer\Logs
```

2. Open the `activation_timestamp.log` file that corresponds to the license for the system you want to revoke.

Ensure the Common Properties and the Node Properties sections correspond to the system you are revoking.

The License String is shown at the bottom of the log file.

3. Save the license string to a file.
 - a) Copy the license string.
Ensure you copy the whole license string from the first * to the end of the file.
 - b) Navigate to the `telm` directory.
`C:\myLocation\Teradata_Deployer\telm`
 - c) Create a new file and name it `lservrc`.
 - d) Paste the license string into the `lservrc` file.
 - e) Save the file.
4. If the Common Properties file that was used to deploy the target system is not available, create a new one.
 - a) From the `activation_timestamp.log` file, copy the Common Properties from the { to }, inclusive.
 - b) Navigate to the `Properties` directory.
`C:\myLocation\Teradata_Deployer\Properties`
 - c) Create a new file and name it.
For example, `Common.Revoke.LostSystem.json`.
 - d) Paste the Common Properties into the file and save it.
5. If the Node Properties file that was used to deploy the target system is not available, create a new one.
 - a) From the `activation_timestamp.log` file, copy the Node Properties from the [to], inclusive.
 - b) Navigate to the `Properties` directory.
`C:\myLocation\Teradata_Deployer\Properties`
 - c) Create a new file and name it.
For example, `Node.Revoke.LostSystem.json`.
 - d) Paste the Node Properties into the file and save it.
6. Complete the applicable procedure to finish the revoking process.
Skip any steps in the following procedures that you have already performed.

Option	Description
With Internet access	See Revoking a License for Sites with Internet Access .
Without Internet access	See Revoking a License for Sites without Internet Access .

Sample Property File Configurations

Sample Property File: MPP with Applications

You can use sample property files to configure a four vNode Teradata Database MPP system with Teradata Viewpoint, Server Management, and Teradata DSC applications. Substitute values specific to your environment for the properties shown in the following `common.IT.properties.json` and `node.IT.properties.json` property files.

For the `common.IT.properties.json` properties file:

```
{
  "TDsystemname": "TD_MPP",
  "domain": "company.com",
  "public_vswitch": "VM Network",
  "byn_vswitch1": "byn_vswitch1",
  "byn_vswitch2": "byn_vswitch2",
  "cmic_vswitch1": "cmic_vswitch1",
  "cmic_vswitch2": "cmic_vswitch2",
  "dsu_vswitch": "dsu_vswitch",
  "public_submask": "255.255.254.0",
  "gateway": "16.25.27.254",
  "dns1": "153.64.251.200",
  "dns2": "153.65.8.10",
  "ntp1": "time00.company.com",
  "ntp2": "time01.company.com",
  "OSTimeZone": "US/Eastern",
  "PDisk_Datastore_Match": "_data",
  "pdiskSizeGB": "800",
  "uniqueDisks": "TRUE",
  "PhysicalCoresPerTPA": "4",
  "Temporal": "FALSE",
  "TemporalDaylightSavings": "FALSE",
  "TemporalTimeDateWZControl": 0,
  "TemporalTimeZoneHour": 0,
  "TemporalTimeZoneMinute": 0,
  "TemporalTimeZoneString": "America Pacific",
  "SecureZones": "FALSE",
  "RowLevelSecurity": "FALSE",
  "Columnar": "FALSE",
  "SiteID": "",
  "MainframeLHID": "-1",
  "Folder": " ",
  "Tier": "ET",
  "EntitlementID": "72105e36-dc59-4abb-871f-5d617b59eb72",
  "LicensePeriodInYears": "1",
```

```
"TeradataEmsURL": "https://slem.teradata.com/ems"
}
```

For the `node.IT.properties.json` properties file. For the latest template version numbers, see [Templates](#).

```
[
  {
    "ESXiHost": "esxi-1.company-domain.com",
    "OS_Datastore": "esxi-01.datastore",
    "vmName": "MPP-01",
    "eth0": "10.25.23.170",
    "vmType": "tpa",
    "Template": "Teradata_Database_16.20.xx.xx_SLES11_SP3_on_VMware"
  },
  {
    "ESXiHost": "esxi-1.company-domain.com",
    "OS_Datastore": "esxi-01.datastore",
    "vmName": "MPP-02",
    "eth0": "10.25.23.171",
    "vmType": "tpa",
    "Template": "Teradata_Database_16.20.xx.xx_SLES11_SP3_on_VMware"
  },
  {
    "ESXiHost": "esxi-1.company-domain.com",
    "OS_Datastore": "esxi-01.datastore",
    "vmName": "MPP-03",
    "eth0": "10.25.23.172",
    "vmType": "tpa",
    "Template": "Teradata_Database_16.20.xx.xx_SLES11_SP3_on_VMware"
  },
  {
    "ESXiHost": "esxi-1.company-domain.com",
    "OS_Datastore": "esxi-01.datastore",
    "vmName": "MPP-04",
    "eth0": "10.25.23.173",
    "vmType": "tpa",
    "Template": "Teradata_Database_16.20.xx.xx_SLES11_SP3_on_VMware"
  },
  {
    "ESXiHost": "esxi-2.company-domain.com",
    "OS_Datastore": "esxi-02.datastore01",
    "vmName": "CMIC-NODE",
    "eth0": "10.25.23.169",
    "vmType": "cmic",
    "Template": "Teradata_CMIC_12.07.xx.xx_SLES11_SP3_on_VMware"
  },
  {
    "ESXiHost": "esxi-2.company-domain.com",
    "OS_Datastore": "esxi-02.datastore02",
    "vmName": "VP-NODE",
    "eth0": "10.25.23.225",
    "vmType": "vp",
    "Template": "Teradata_Viewpoint_16.20.xx.xx_SLES11_SP3_on_VMware"
  },
  {
    "ESXiHost": "esxi-2.company-domain.com",
    "OS_Datastore": "esxi-02.datastore03",
    "vmName": "DSC-NODE",
    "eth0": "10.25.23.240",
    "vmType": "dsu",
    "Template": "Teradata_DSC_16.20.xx.xx_SLES11_SP3_on_VMware"
  }
]
```

Sample Property File: Single-Node with Applications

You can use sample property files to configure a Teradata Database single-node system with the Teradata Viewpoint and Server Management applications. Substitute values specific to your environment for the properties shown in the following `common.IT.properties.json` and `node.IT.properties.json` property files.

For the `common.IT.properties.json` properties file:

```
{
  "TDsystemname": "TD_Single",
  "domain": "company.com",
  "public_vswitch": "VM Network",
  "byn_vswitch1": "",
  "byn_vswitch2": "",
  "cmic_vswitch1": "cmic_vswitch1",
  "cmic_vswitch2": "cmic_vswitch2",
  "dsu_vswitch": "",
  "public_submask": "255.255.254.0",
  "gateway": "16.25.27.254",
  "dns1": "153.64.251.200",
  "dns2": "153.65.8.10",
  "ntp1": "time00.company.com",
  "ntp2": "time01.company.com",
  "OSTimeZone": "US/Eastern",
  "PDisk_Datastore_Match": "_data",
  "pdiskSizeGB": "800",
  "uniqueDisks": "TRUE",
  "PhysicalCoresPerTPA": "4",
  "Temporal": "FALSE",
  "TemporalDaylightSavings": "FALSE",
  "TemporalTimeDateWZControl": 0,
  "TemporalTimeZoneHour": 0,
  "TemporalTimeZoneMinute": 0,
  "TemporalTimeZoneString": "America Pacific",
  "SecureZones": "FALSE",
  "RowLevelSecurity": "FALSE",
  "Columnar": "FALSE",
  "SiteID": "",
  "MainframeLHID": "-1",
  "Folder": "",
  "Tier": "ET",
  "EntitlementID": "72105e36-dc59-4abb-871f-5d617b59eb72",
  "LicensePeriodInYears": "1",
  "TeradataEmsURL": "https://slem.teradata.com/ems"
}
```

For the `node.IT.properties.json` properties file. For the latest template version numbers, see [Templates](#).

```
[
  {
    "ESXiHost": "esxi-1.company-domain.com",
    "OS_Datastore": "esxi-01.datastore",
    "vmName": "TD_Single",
    "eth0": "255.255.100.130",
    "vmType": "tpa",
    "Template": "Teradata_Database_16.20.xx.xx_SLES11_SP3_on_VMware"
  }
]
```

```

    },
    {
      "ESXiHost": "esxi-1.company-domain.com",
      "OS_Datastore": "esxi-01.datastore",
      "vmName": "TD_SM",
      "eth0": "255.255.100.131",
      "vmType": "cmic",
      "Template": "Teradata_CMIC_12.07.xx.xx_SLES11_SP3_on_VMware"
    },
    {
      "ESXiHost": "esxi-1.company-domain.com",
      "OS_Datastore": "esxi-01.datastore",
      "vmName": "TD_VP",
      "eth0": "255.255.100.132",
      "vmType": "vp",
      "Template": "Teradata_Viewpoint_16.20.xx.xx_SLES11_SP3_on_VMware"
    }
  ]

```

Sample Property File: Single-Node without Applications

You can use sample property files to configure a Teradata Database single-node system without applications. Substitute values specific to your environment for the properties shown in the following `common.IT.properties.json` and `node.IT.properties.json` property files.

For the `common.IT.properties.json` properties file:

```

{
  "TDsystemname": "TD_Single",
  "domain": "company.com",
  "public_vswitch": "VM Network",
  "byn_vswitch1": "",
  "byn_vswitch2": "",
  "cmic_vswitch1": "",
  "cmic_vswitch2": "",
  "dsu_vswitch": "",
  "public_submask": "255.255.254.0",
  "gateway": "16.25.27.254",
  "dns1": "153.64.251.200",
  "dns2": "153.65.8.10",
  "ntp1": "time00.company.com",
  "ntp2": "time01.company.com",
  "OSTimeZone": "US/Eastern",
  "PDisk_Datastore_Match": "_data",
  "pdiskSizeGB": "800",
  "uniqueDisks": "TRUE",
  "PhysicalCoresPerTPA": "4",
  "Temporal": "FALSE",
  "TemporalDaylightSavings": "FALSE",
  "TemporalTimeDateWZControl": 0,
  "TemporalTimeZoneHour": 0,
  "TemporalTimeZoneMinute": 0,
  "TemporalTimeZoneString": "America Pacific",
  "SecureZones": "FALSE",
  "RowLevelSecurity": "FALSE",
  "Columnar": "FALSE",
  "SiteID": "",
  "MainframeLHID": "-1",

```



```

    "Folder": " ",
    "Tier": "ET",
    "EntitlementID": "72105e36-dc59-4abb-871f-5d617b59eb72",
    "LicensePeriodInYears": "1",
    "TeradataEmsURL": "https://slem.teradata.com/ems"
  }

```

For the `node.IT.properties.json` properties file. For the latest template version numbers, see [Templates](#).

```

[
  {
    "ESXiHost": "esxi-1.company-domain.com",
    "OS_Datastore": "esxi-01.datastore",
    "vmName": "TD_Single",
    "eth0": "255.255.100.130",
    "vmType": "tpa",
    "Template": "Teradata_Database_16.20.xx.xx_SLES11_SP3_on_VMware"
  }
]

```

