

This guide shows you how to manually deploy and connect to a VM that is configured to run SAP NetWeaver on Microsoft Windows Server-based systems on Google Cloud. To deploy a VM that is running Linux, see the [Linux Deployment Guide \(/solutions/sap/docs/netweaver-deployment-guide-linux\)](/solutions/sap/docs/netweaver-deployment-guide-linux).

Deploy your VM and associated resources manually only if you require more control over your system configuration than Cloud Deployment Manager provides. Using Cloud Deployment Manager to deploy your Google Cloud resources is recommended because you can deploy SAP-certified VM configurations for SAP NetWeaver quickly, consistently, and with fewer errors. To learn more about Cloud Deployment Manager, see [Automated VM deployment for SAP NetWeaver on Windows Server \(/solutions/sap/docs/netweaver-deployment-windows-dm\)](/solutions/sap/docs/netweaver-deployment-windows-dm).

These instructions give you the details for setting up a 2-tier system, with all the SAP components and the database running on a single VM. During deployment, you also install Google's monitoring agent and can validate that it is sending metrics to SAP. This guide also includes considerations for migrating an existing system and for setting up a 3-tier scale-out system.

For more details on planning your implementation, see the [Planning Guide \(/solutions/sap/docs/netweaver-planning-guide\)](/solutions/sap/docs/netweaver-planning-guide). For an overview of IT ops for your system, see the [Operations Guide \(/solutions/sap/docs/netweaver-operations-guide\)](/solutions/sap/docs/netweaver-operations-guide).

To create a project:

1. [Sign in \(https://accounts.google.com/Login\)](https://accounts.google.com/Login) to your Google Account.

If you don't already have one, [sign up for a new account \(https://accounts.google.com/SignUp\)](https://accounts.google.com/SignUp).

2. In the Cloud Console, on the project selector page, select or create a Cloud project.

★ **Note:** If you don't plan to keep the resources that you create in this procedure, create a project instead of selecting an existing project. After you finish these steps, you can delete the project, removing all resources associated with the project.

[Go to the project selector page \(https://console.cloud.google.com/projectselector2/home/dashboard\)](https://console.cloud.google.com/projectselector2/home/dashboard)

3. Make sure that billing is enabled for your Google Cloud project. [Learn how to confirm billing is enabled for your project](#) (/billing/docs/how-to/modify-project).

These instructions use [Cloud Shell](#) (/shell/docs/) to enter `gcloud` commands that deploy or configure your Google Cloud resources. Cloud Shell is accessed through the Cloud Console in your browser.

Cloud Shell runs on a VM that Google Cloud provisions each time you start Cloud Shell. The first time you use Cloud Shell, Google Cloud also creates a persistent `$HOME` directory for you, which is restored each time you open Cloud Shell.

The provisioned VM includes the latest [Cloud SDK](#) (/sdk/docs/), which provides the `gcloud` command-line interface. Therefore, the `gcloud` commands that you use in Cloud Shell are the same as those you would use in a locally installed instance of the Cloud SDK.

If you have the Cloud SDK installed, you can issue the `gcloud` commands that are used in these instructions from your local machine. However, with a locally installed Cloud SDK you must always make sure that you are using the latest version of the Cloud SDK.

Whether you use Cloud Shell or Cloud SDK, you can set and change the properties of your `gcloud` command environment and save them as a *configuration*. Configurations are collections of key-value pairs that influence the behavior of the `gcloud` commands.

Some basic actions you can take with a configuration in Cloud Shell include:

- Initialize a configuration with `gcloud init`.
- Check the settings of your current `gcloud` configuration with `gcloud config list`.
- Change the Google Cloud project you are working in with `gcloud config set project [PROJECT_ID]` where `[PROJECT_ID]` represents your Google Cloud project.
- Set a default region with `gcloud config set compute/region [REGION]` where `[REGION]` represents a Google Cloud region.
- Set a default zone with `gcloud config set compute/zone [ZONE]` where `[ZONE]` represents a Google Cloud zone.
- Create a new configuration with `gcloud config configurations create [NAME]` where `[NAME]` represents the name for the configuration.

For more information about working with configurations, see [Managing Cloud SDK configurations \(/sdk/docs/configurations\)](/sdk/docs/configurations).

For security purposes, create a new network. You control who has access by adding firewall rules or by using another access control method.

If your project has a default VPC network, don't use it. Instead, create your own VPC network so that the only firewall rules in effect are those that you create explicitly.

To avoid unintentionally exposing your VM instance to the internet, follow these recommendations:

Use a NAT gateway.

[Create firewall rules \(/vpc/docs/using-firewalls#creating\\_firewall\\_rules\)](/vpc/docs/using-firewalls#creating_firewall_rules) that block all external access that you don't require.

When you create your VMs:

- Specify a network tag for each VM for use in routing and firewall rules. If you use the Deployment Manager templates that Google Cloud provides, specify a tag with **networkTag: [TAG]**.
- Create the VMs without an external IP. If you use the Deployment Manager templates that Google Cloud provides, specify **publicIP: No**.

1. Go to Cloud Shell.

[OPEN Cloud Shell \(https://console.cloud.google.com/?cloudshell=true\)](https://console.cloud.google.com/?cloudshell=true)

2. Create a new network in the custom subnetworks mode:

where:

- **[YOUR\_NETWORK\_NAME]** is the name of the new network. The network name can contain only lowercase characters, digits, and the dash character (-).

Specify `--subnet-mode custom` to avoid using the default auto mode, which automatically creates a subnet in each Compute Engine region. For more information, see [Subnet creation mode](#) (/vpc/docs/vpc#subnet-ranges).

3. Create a subnetwork, and specify the region and IP address range:

where:

- [YOUR\_SUBNETWORK\_NAME] is the new subnetwork.
- [YOUR\_NETWORK\_NAME] is the name of the network you created in the previous step.
- [REGION] is the region where you want the subnetwork. Use a region that is [supported for SAP NetWeaver](#) (/solutions/sap/docs/netweaver-planning-guide#planning\_regions\_zones).
- [YOUR\_RANGE] is the IP address range, [specified in CIDR format](#) ([https://wikipedia.org/wiki/Classless\\_Inter-Domain\\_Routing](https://wikipedia.org/wiki/Classless_Inter-Domain_Routing)), such as `10.1.0.0/24`. If you plan to add more than one subnetwork, assign non-overlapping CIDR IP address ranges for each subnetwork in the network. Note that each subnetwork and its internal IP address ranges are mapped to a single region.

4. Optionally, repeat the previous step and add additional subnetworks.

If you intend to create a VM without a public IP address, you must create a NAT gateway so that your VM can access the internet to download Google's monitoring agent. If you intend to assign an external public IP address to your VM, you can skip this procedure.

1. Create a VM to act as the NAT gateway in the subnet you just created:

where:

- [YOUR\_VM\_NAME] is the name of the VM you are creating that you want to use for the NAT gateway.
- [YOUR\_ZONE] is the zone where you want the VM.
- [YOUR\_IMAGE\_FAMILY] and [YOUR\_IMAGE\_PROJECT] specify the image you want to use (/compute/docs/images#os-compute-support) for the NAT gateway VM.
- [YOUR\_MACHINE\_TYPE] is any supported machine type. If you expect high network traffic, choose a machine type with that has at least 8 virtual CPUs.
- [YOUR\_SUBNETWORK\_NAME] is the name of the subnetwork where you want the VM.
- [YOUR\_VM\_TAG] is the tag that is applied to the VM you are creating. If you will also use this VM as a bastion host (/solutions/sap/docs/netweaver-planning-guide#bastion\_hosts\_nat), this tag is used to apply the firewall rule only to this VM.

2. Create a route that is tagged so that traffic passes through the NAT VM instead of the default internet gateway:

where:

- [YOUR\_ROUTE\_NAME] is the name of the route you are creating.
- [YOUR\_NETWORK\_NAME] is the network you created.
- [YOUR\_VM\_NAME] is the VM you are using for your NAT gateway.
- [YOUR\_ZONE] is the zone where the VM is located.
- [YOUR\_TAG\_NAME] is the tag on the route that directs traffic through the NAT VM.

3. If you also want to use the NAT Gateway VM as a bastion host, run the following command to allow inbound SSH access to this instance from the internet:

where:

- [YOUR\_NETWORK\_NAME] is the network you created.
- [YOUR\_VM\_TAG] is the tag you specified when you created the NAT gateway VM. This tag is used so this firewall rule applies only to the VM that hosts the NAT gateway, and not to all VMs in the network.

By default, incoming connections from outside your Google Cloud network are blocked. To allow incoming connections, set up a firewall rule for your VM. Firewall rules regulate only new incoming connections to a VM. After a connection is established with a VM, traffic is permitted in both directions over that connection.

You can create a firewall rule to allow access to specified ports, or to allow access between VMs on the same subnetwork.

Create firewall rules to allow access for such things as:

- The default ports used by SAP NetWeaver, as documented in [TCP/IP Ports of All SAP Products](https://help.sap.com/viewer/575a9f0e56f34c6e8138439eefc32b16/2.0/en-US/616a3c0b1cc748238de9c0341b15c63c.html) (https://help.sap.com/viewer/575a9f0e56f34c6e8138439eefc32b16/2.0/en-US/616a3c0b1cc748238de9c0341b15c63c.html)
- Connections from your computer or your corporate network environment to your Compute Engine VM instance. If you are unsure of what IP address to use, talk to your company's network admin.
- Communication between VMs in a 3-tier or scaleout configuration. For example, if you are deploying a 3-tier system, you will have at least 2 VMs in your subnetwork: the VM for SAP NetWeaver, and another VM for the database server. To enable communication between the two VMs, you must create a firewall rule to allow traffic that originates from the subnetwork.
- RDP connections to your VM instance through port **3389**.
- PowerShell connections to your VM instance through port **5986**.

The following procedure is a simplified version of the instructions for creating firewall rules. For more detailed instructions, see [Virtual Private Cloud documentation \(/vpc/docs/using-firewalls#creating\\_firewall\\_rules\)](#).

To create a firewall rule:

1. In the Cloud Console, go to the **Firewall Rules** page.

[Open Firewall Rules page](https://console.cloud.google.com/networking/firewalls/list) (https://console.cloud.google.com/networking/firewalls/list)

2. At the top of the page, click **Create firewall rule**.

- In the **Network** field, select the network where your VM is located.
- In the **Targets** field, select **All instances in the network**.
- In the **Source filter** field, select one of the following:
  - **IP ranges** to allow incoming traffic from specific IP addresses. Specify the range of IP addresses in the **Source IP ranges** field.
  - **Subnets** to allow incoming traffic from a particular subnetwork. Specify the subnetwork name in the following **subnets** field. You can use this option to allow access between the VMs in a 3-tier or scaleout configuration.
- In the **Protocols and ports** section, select **Specified protocols and ports** and specify `tcp: [PORT_NUMBER] ;`.

3. Click **Create** to create your firewall rule.

The following instructions show you how to deploy a VM for an example 2-tier SAP system running Microsoft Windows and Microsoft SQL Server, SAP ASE, or IBM Db2 for Linux, UNIX, and Windows (IBM Db2). All the SAP NetWeaver components and the central database run on one VM.

For general considerations for a 3-tier system, see [Deploying a 3-tier scale-out system](#) (#deploying\_a\_3-tier\_scale-out\_system).

Before you begin, ensure that you have consulted the [Planning Guide](#) (/solutions/sap/docs/netweaver-planning-guide) and, if you are going to use Microsoft SQL Server, that you have decided how you want to install the SQL Server database from the following options:

- Use a Google Cloud image that includes the database.
- Install it using installation media.

When you create a VM, you can specify several options, including the operating system, region, machine type, and persistent disks. You must also specify a start-up script to install Google's monitoring agent on the VM.

To create a VM:

1. Go to the **Images** page in Compute Engine:

[Go to the Images page](https://console.cloud.google.com/compute/images) (<https://console.cloud.google.com/compute/images>)

2. Choose a public image that contains a version of Microsoft Windows Server that is supported by SAP.

If you are using Microsoft SQL Server as your database, you can migrate your existing license to GCP or use a Compute Engine Windows Server image that has SQL Server preinstalled. For more information about the SQL Server images provided by Google Cloud, see [Windows on Compute Engine](https://cloud.google.com/compute/docs/instances/windows/#sql_server) ([https://cloud.google.com/compute/docs/instances/windows/#sql\\_server](https://cloud.google.com/compute/docs/instances/windows/#sql_server)).

For the versions of Windows Server and SQL Server that are supported by SAP on GCP, see [SAP Note 2456432: SAP Applications on Google Cloud Platform: Supported Products and Google VM types](https://launchpad.support.sap.com/#/notes/2456432) (<https://launchpad.support.sap.com/#/notes/2456432>).

3. Click the **Create instance** button.
4. Enter a name for the VM.

Limit your name to 13 characters, because this is the maximum supported by SAP. For more information, see [SAP Note 611361: Hostnames of SAP servers](https://launchpad.support.sap.com/#/notes/611361) (<https://launchpad.support.sap.com/#/notes/611361>).

5. Select the region and zone for your VM based on the location of your internal resources and users, and based on the CPU platform you want to use.

For more details on the zones supported for SAP NetWeaver, see the following guides and SAP Notes:

- [SAP Netweaver on Google Cloud Planning Guide](/solutions/sap/docs/netweaver-planning-guide#planning_regions_zones) ([/solutions/sap/docs/netweaver-planning-guide#planning\\_regions\\_zones](/solutions/sap/docs/netweaver-planning-guide#planning_regions_zones))
- [SAP Note 2456953 - Windows on Google Cloud Platform \(IaaS\): Adaptation of your SAP License](https://launchpad.support.sap.com/#/notes/2456953) (<https://launchpad.support.sap.com/#/notes/2456953>)

6. Under **Machine type**, select a pre-defined `n1-standard` or `n1-highmem` machine type or customize a VM to more precisely match the VM's vCPUs and memory to your expected workload.



★ **Note:** Before you customize a VM for SAP NetWeaver, review the information about custom machine types in the [Planning Guide](/solutions/sap/docs/netweaver-planning-guide#machine_types) (/solutions/sap/docs/netweaver-planning-guide#machine\_types) and in [SAP Note 2456432](https://launchpad.support.sap.com/#/notes/2456432) (https://launchpad.support.sap.com/#/notes/2456432).

To compare the supported machine types and their persistent-disk limitations, see the [Planning Guide](/solutions/sap/docs/netweaver-planning-guide#machine_types) (/solutions/sap/docs/netweaver-planning-guide#machine\_types).

7. Optionally, in the **Boot disk** section, click **Change** to adjust the size of your boot disk. Ensure that the boot disk is at least 50 GB.
8. Under **Access Scope**, for the Compute Engine default service account, select **Set access for each API**.

To ensure that your VM instance can interact with Compute Engine and Stackdriver and that the Google monitoring agent functions correctly, the following API access for the service account are recommended:

API	Access
Cloud Source Repositories	Read Write
Compute Engine	Read Write
Service Control	Enabled
Service Management	Read Only
Stackdriver Logging API	Full
Stackdriver Monitoring API	Full
Stackdriver Trace	Write Only
Storage	Full

9. Expand the **Management, disks, networking, sole tenancy** section.
10. If you are using a NAT gateway, in the **Networking** tab, under **Network tags**, add the tag that you specified as [YOUR\_TAG\_NAME] when you set up the route that directs traffic through the gateway.
11. In the **Management** tab, under **Automation > Metadata**, specify the following text in the **Key** and **Value** boxes to run the startup script that installs the Google monitoring agent:

- **Key:**

- **Value:**

Windows runs the script as administrator.

The Google monitoring agent runs as a Windows service named **Google Cloud Metrics Provider**. Do not delete or modify this service. It is required for the continuous operation of Google's monitoring agent.

The Google monitoring agent, which sends data to the SAP monitoring system, must be installed and running to get support from SAP.

For more information about the Google monitoring agent, see the [Operations Guide](/solutions/sap/docs/netweaver-operations-guide#understanding_the_monitoring_agent_lifecycle) (/solutions/sap/docs/netweaver-operations-guide#understanding\_the\_monitoring\_agent\_lifecycle).

12. In the **Management** tab, under **Availability policy**, ensure that you leave the following default settings:
  - To ensure availability of your SAP systems, keep the **Preemptibility** setting **Off (recommended)**.
  - To ensure that your VM can restart if there's a maintenance or failure event, keep the **Automatic restart** setting **On (recommended)**.
  - To ensure that your VM is migrated to other hardware during infrastructure maintenance, keep the **On host maintenance** setting on **Migrate VM instance (recommended)**.
13. Optionally, in the **Disks** tab, under **Boot disk > Deletion rule**, deselect the **Delete boot disk when instance is deleted** checkbox.
14. In the **Disks** tab, under **Additional disks**, click **Add new disk** to add persistent disks for storage. For NetWeaver, add disks for the SAP NetWeaver binaries and the pagefile disk. For the database server, you also need disks for things like the database data and logs.
  - a. Optionally, specify a name in the **Name** field.
  - b. In the **Create a disk** window, under **Disk Type** select the disk type. In most cases, select a standard persistent disk (HDD). Depending on your performance objectives, you can use solid-state drive (SSD) disk instead.

c. Under **Source type**, select **Blank disk**.

d. Specify the size of your disk.

- For the pagefile disk, size the disk according to your needs. The minimum recommended size is 24 GB. For larger instances, you might need more. For more information on calculating the size required for the page file, see [SAP Note 1518419: Page file and virtual memory required by the SAP system](https://launchpad.support.sap.com/#/notes/1518419) (<https://launchpad.support.sap.com/#/notes/1518419>).

Add more disks if needed.

- If you want to sustain the [maximum throughput rates mentioned in the Planning Guide](/solutions/sap/docs/netweaver-planning-guide) (/solutions/sap/docs/netweaver-planning-guide), ensure that you have at least 834 GB of space for the database data.

e. Click **Done** to save your disk settings.

f. Repeat these steps for each disk you need to add to your system.

15. In the **Networking** tab, under **Network interfaces**, click the pencil icon to edit the selected network interface. Select [the network that you created](#) (#creating\_a\_network) previously.

16. Click **Create** to create and start the instance.

At the bottom of the page, you can click **REST** or **command line** to see the equivalent REST and `gcloud` commands for the instance you are creating. These can be useful for creating additional VMs.

To connect to a Windows-based VM, you must first generate a password for the VM. You can then connect to the VM using RDP or PowerShell.

1. Go to the **VM instances** page.

[OPEN VM INSTANCES](https://console.cloud.google.com/compute/instances) (<https://console.cloud.google.com/compute/instances>)

2. Click the name of the VM instance for which you need a new password.

3. On the instance details page, click the **Set Windows Password** button. A password is generated for you.

If you have defined a firewall rule (#adding\_firewall\_rules) that allows access on port 3389, you can use RDP to connect to a Windows instance and start a Remote Desktop session. Alternatively, you can connect to Windows instances using the PowerShell terminal (#using\_powershell).

Connect to the remote desktop on Windows instances using one of the following methods:

- Use a Chrome browser that has the Chrome RDP for Google Cloud extension (<https://chrome.google.com/webstore/detail/chrome-rdp-for-google-clo/mpbbnannobiobpfnblimoapbephgifkm/>) installed and establish an RDP connection from Cloud Console.
- Download the RDP file and manually connect through the Windows Remote Desktop Connection client or a third-party client.

1. If you have not created a username and password on the Windows VM yet, [create your Windows password](#) (#generating\_passwords).
2. [Add a firewall rule](#) (#adding\_firewall\_rules) or edit your existing firewall rule to open port 5986 on the [Google Cloud network](#) (/compute/docs/networking) where your Windows Server VM is located.
3. On your local workstation, open the PowerShell terminal.

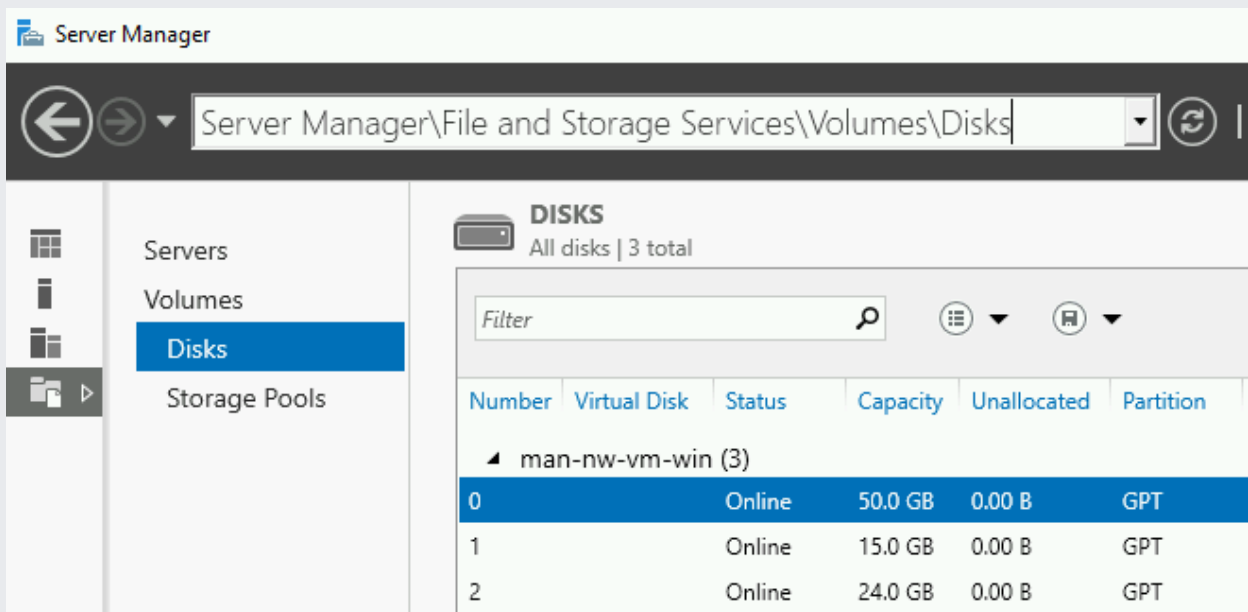
4. Optionally, you can initialize a variable to hold your user credentials so you do not need to enter them each time you connect to the instance. If you skip this step, you receive a prompt for your username and password later.

5. Use the [Enter-PSSession command](#)

(<https://msdn.microsoft.com/en-us/powershell/reference/5.1/microsoft.powershell.core/enter-pssession>) to start a remote PowerShell session and include the flags to use SSL and skip credentials checks.

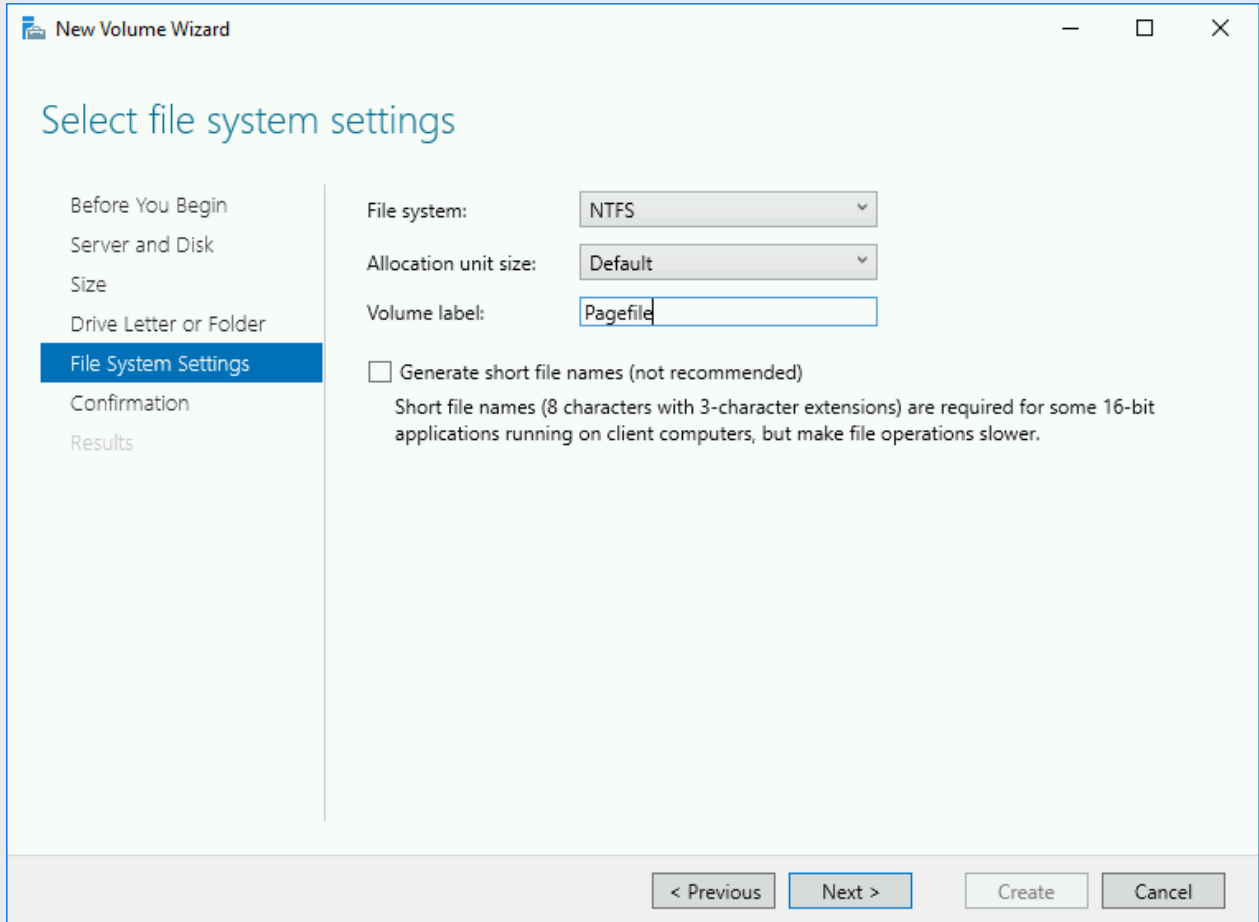
After you have connected to your Windows VM, format your disks so that you can begin using them. You also configure the Windows pagefile.

1. From the Windows **Start** menu, search for and open the Server Manager.
2. Select **File and Storage Services** and then select **Disks**.



3. In the **Disks** dialog box, right-click the first disk, and then select **New Volume**. The **New Volume Wizard** opens.

4. Optionally, on the **Drive Letter or Folder** panel, select a drive letter for the disk. For example, S for the SAP disk, or P for the pagefile disk. You can accept all other defaults.
5. On the **File System Settings** panel, enter a volume label that describes the disk with a meaningful name, such as **SAP** or **Pagefile**.



6. Accept all other defaults.
7. Repeat these steps for the additional disks.

Microsoft recommends that the SQL Server data and log disks be formatted as 64 KB, but the persistent disk technology Google Cloud aligns better with 32 KB. The 32 KB size also decreases the number of disk operations that count toward persistent disk I/O limit.

After you have created your VM, configure the operating system:

- If your configuration calls for it, join the Windows Server OS to a domain.

- Configure the High Performance power plan  
(/compute/docs/tutorials/creating-high-performance-sql-server-instance#setting\_the\_power\_profile).
- Add Windows firewall rules to enable access to SAP NetWeaver from a remote connection.
- Calculate the page file size referencing SAP Note 1518419: Page file and virtual memory required by the SAP system (<https://launchpad.support.sap.com/#/notes/1518419>) and configure the Windows Pagefile  
([https://help.sap.com/saphelp\\_nw73ehp1/helpdata/EN/4d/0b7b6d277f5ca8e10000000a42189e/content.htm](https://help.sap.com/saphelp_nw73ehp1/helpdata/EN/4d/0b7b6d277f5ca8e10000000a42189e/content.htm))

If you haven't yet deployed your database on Google Cloud, follow the instructions for setting up your database in both the Google Cloud deployment guide for your database, and in the database documentation that is provided by your database vendor.

Google Cloud provides deployment guides for the following SAP-certified databases:

- SAP HANA guides (/solutions/sap/docs/sap-hana-guides): when SAP NetWeaver is running on Windows, SAP HANA is supported only in 3-tier architectures.
- SAP ASE guides (/solutions/sap/docs/sap-ase-guides)
- SAP MaxDB guides (/solutions/sap/docs/sap-maxdb-guides)
- IBM Db2 guides (/solutions/sap/docs/sap-ibm-db2-guides)
- Windows SQL Server guide (/compute/docs/instances/sql-server/creating-sql-server-instances)

When SAP NetWeaver and the database server are running on different VMs in a 3-tier architecture, make sure that your firewall rules are defined to allow communication between the VMs.

If you used the Google Cloud-provided Windows image that contains SQL Server, you must change the collation to use the SAP collation.

If you selected the Google-provided SQL Server Enterprise operating system image when you created your VM, you must configure SQL Server to use the SAP collation  
(<https://docs.microsoft.com/en-us/sql/relational-databases/collations/collation-and-unicode-support>)



(SQL\_Latin1\_General\_CP850\_BIN2) so that SQL Server is compatible with SAP systems. The default collation in the Google Cloud-provided SQL Server image is (SQL\_Latin1\_General\_CP1\_CI\_AS).

To change the collation after the VM is deployed:

1. Connect to your Windows instance by using either RDP or remote PowerShell.
2. Sign in to Windows as an admin and stop the `MSSQLSERVER` service.
3. Go to the directory that contains the binaries for your SQL Server instance, for example, `C:\Program Files\Microsoft SQL Server\MSSQL11.MSSQLSERVER\MSSQL\Binn.`
4. From an elevated command prompt, change the collation by running:

where:

- The parameter `-m` starts the SQL Server instance in single-user mode.
  - The trace flag `4022` forces SQL Server to skip any stored startup procedures.
  - The trace flag `3659` allows all errors to be logged to the SQL Server logs.
  - The parameter `-s` specifies the name of the SQL Server instance to start. Replace `[SQL_SERVER_INSTANCE_NAME]` with your SQL Server instance name.
  - The parameter `-q` rebuilds all databases and objects to the specified SAP collation, without reinstalling the instance or rebuilding system databases.
5. Restart the SQL Server Service `MSSQLSERVER` after the collation is changed.
  6. Confirm your change in the most recent SQL Server `ERRORLOG` or the server's collation properties.

For more information about the configuration of SQL Server for SAP, see:

- [Upgrade to and Installation of SQL Server 2016 in an SAP Environment](https://help.sap.com/viewer/upgrade_sql2016)  
([https://help.sap.com/viewer/upgrade\\_sql2016](https://help.sap.com/viewer/upgrade_sql2016))
- [SAP Note 2201060 - Setting up Microsoft SQL Server 2016](https://launchpad.support.sap.com/#/notes/2201060)  
(<https://launchpad.support.sap.com/#/notes/2201060>)

The Stackdriver Logging agent provides you with a solution for Google Cloud system-activity logging, including operating system events and, if you are using SAP HANA, SAP HANA events. The Stackdriver Logging agent is an optional but recommended component. See the [SAP NetWeaver on Google Cloud operations guide \(/solutions/sap/docs/netweaver-operations-guide#use\\_stackdriver\\_logging\)](/solutions/sap/docs/netweaver-operations-guide#use_stackdriver_logging) for more information about Google Cloud logging.

To install the Stackdriver Logging agent in your new VM, see the instructions for Linux and Windows in [Installing the agent \(/logging/docs/agent/installation#joint-install\)](/logging/docs/agent/installation#joint-install).

For instructions on installing SAP NetWeaver on your new VM, see [the SAP help portal \(https://help.sap.com/viewer/p/SAP\\_NETWEAVER\\_750\)](https://help.sap.com/viewer/p/SAP_NETWEAVER_750) and the [SAP NetWeaver Master Guide \(https://help.sap.com/doc/18cb1a50b9924bc3b94c2988cc8c51d9/7.5/en-US/mg\\_nw\\_75.pdf\)](https://help.sap.com/doc/18cb1a50b9924bc3b94c2988cc8c51d9/7.5/en-US/mg_nw_75.pdf).

**Important:** The Software Provisioning Manager (SWPM) chooses the disk drive with the most free space as an installation location for each component. On Google Cloud, it's important that you don't accept the defaults. Be sure to assign the proper roles in the SWPM dialog boxes.

After you install SAP NetWeaver:

1. Update the SAP kernel to the minimum supported patch level.

For details on the supported SAP kernel patch levels, see [SAP Note 2456953 - Windows on Google Cloud \(IaaS\): Adaptation of your SAP License \(https://launchpad.support.sap.com/#/notes/2456953\)](https://launchpad.support.sap.com/#/notes/2456953).

2. Install your permanent SAP NetWeaver license.

For more information from SAP about managing your SAP NetWeaver licenses, see [SAP Licensing Procedure \(https://help.sap.com/viewer/0643d547dfad4ce497bd7da1264fce77/7.5.6/en-US/fbde4502adef496988fe13d459d66b8b.html\)](https://help.sap.com/viewer/0643d547dfad4ce497bd7da1264fce77/7.5.6/en-US/fbde4502adef496988fe13d459d66b8b.html).

The SAP Host Agent has been enhanced for running on Google Cloud. Ensure that you run at least the minimum SAP Host Agent version required for the Google Cloud environment.

For details, refer to the following SAP Notes:

- SAP Note [1409604 - Virtualization on Windows: Enhanced Monitoring](https://launchpad.support.sap.com/#/notes/1409604) (<https://launchpad.support.sap.com/#/notes/1409604>).
- To update your SAP Host Agent by default on a regular basis, see SAP Note [1473974 - Using the SAP Host Agent Auto Upgrade Feature](https://launchpad.support.sap.com/#/notes/1473974) (<https://launchpad.support.sap.com/#/notes/1473974>).

After you have deployed a VM and installed SAP NetWeaver, validate that Google's monitoring agent is functioning properly with SAP's enhanced monitoring.

You can check whether the monitoring agent is running by polling for a *health check* from the server. Follow these steps:

1. Use RDP to connect to the VM instance you want to monitor.
2. In a browser, visit `http://localhost:18181/health`.

If the monitoring agent is functioning properly, the value for `status` is `UP`. For example:

If the monitoring agent isn't running, see the Operations Guide section about [restarting Google's monitoring agent](/solutions/sap/docs/netweaver-operations-guide#restarting_monitoring) ([/solutions/sap/docs/netweaver-operations-guide#restarting\\_monitoring](/solutions/sap/docs/netweaver-operations-guide#restarting_monitoring)).

To check whether the connection between Google's monitoring agent and SAP NetWeaver works as intended, enter transaction `ST06` in your SAP NetWeaver ABAP system. In the overview pane, check the availability and content of the following fields for the correct end-to-end setup of the SAP and Google monitoring infrastructure:

- **Cloud Provider:** `Google Cloud Platform`
- **Enhanced Monitoring Access:** `TRUE`

- **Enhanced Monitoring Details:** ACTIVE

The steps to deploy each VM in a 3-tier system are very similar to the steps for deploying the example system. In a 3-tier scale-out system, you deploy several VMs, all in the same zone:

- A primary VM that runs the SAP NetWeaver application server (AS) and ABAP central services. This VM also hosts a shared file system that contains the shared profile and must be accessible from each VM that runs SAP NetWeaver in the system.
- Some number of additional VMs that run the AS, for scaling purposes.
- A VM that is dedicated to the central database.

The high-level steps are as follows:

1. Create the VM that hosts the database and then install the database. If you used a Compute Engine image that includes SQL Server, the database is already installed.
2. Create the primary instance.
  - Run SWPM on the first VM that you want to run SAP NetWeaver.
  - Install central services.
  - Install the AS.
  - Point to the existing database.
3. Create additional instances.
  - Run SWPM on each additional VM that you want to run SAP NetWeaver.
  - Install the AS.
  - Point to the existing database.
  - Point to the network share that contains the profiles and is managed by the primary instance.

This section contains information about how to correct common issues.

If you are setting up a 3-tier SAP system and having connection issues between your VMs, ensure that you have created a firewall rule ([#adding\\_firewall\\_rules](#)) to allow traffic between VMs on your subnetwork.

To troubleshoot the monitoring agent, see the Operations guide ([/solutions/sap/docs/netweaver-operations-guide#troubleshooting\\_monitoring](#)).