

This guide uses Deployment Manager to deploy all of the required Google Cloud resources to run SAP NetWeaver on Linux, including the Compute Engine virtual machine (VM), the Linux operating system, and the persistent disks. You define the values for the installation, such as machine type, resource names, disk sizes, and so forth, in a Deployment Manager configuration file template.

If your SAP NetWeaver installation requires more control over the deployment process than the Deployment Manager template provides, see [Manual VM deployment for SAP NetWeaver on Linux](/solutions/sap/docs/netweaver-deployment-linux-manual) (/solutions/sap/docs/netweaver-deployment-linux-manual).

To deploy a VM that is running Windows, see the [Windows deployment guide](/solutions/sap/docs/netweaver-deployment-guide-windows) (/solutions/sap/docs/netweaver-deployment-guide-windows).

The VM that is deployed by these instructions is for use in a 3-tier configuration, where SAP NetWeaver runs on one VM and the database server runs on another.

To set up a 2-tier configuration, where SAP NetWeaver runs on the same VM as the database server, you deploy the database server first and create the VM and the required disk drives for both the database server and for SAP NetWeaver at that time. You then install SAP NetWeaver on the same VM as the database server.

For instructions about deploying the VM for a database server, see the [database deployment guide](/solutions/sap/docs/) (/solutions/sap/docs/) for your database server.

The Google Cloud resources that are deployed by Deployment Manager include:

- A VM that uses an SAP-certified version of Linux.
- A persistent disk for the boot disk.
- A persistent disk for SAP binaries.
- A persistent disk for swap space.

- The recommended APIs.
- Google's monitoring agent.

The following instructions use Cloud Shell, but if you prefer, you can use the Cloud SDK in your local terminal instead.

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) (/billing/docs/how-to/modify-project).

These instructions use [Cloud Shell](/shell/docs/) (/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 \(/sdk/docs/\)](/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) 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)

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), 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. If you are using SUSE Linux Enterprise Server (SLES) for your SAP NetWeaver components, you must specify a SLES VM for your gateway as well. However, if you are using Red Hat Enterprise Linux (RHEL), then you don't have to select a premium image for your gateway. For example, to select the latest version of Debian, specify `--image-family debian` and `--image-project debian-cloud`.

- [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.
- SSH connections to your VM instance, including [SSH from the browser](https://cloud.google.com/compute/docs/ssh-in-browser) (<https://cloud.google.com/compute/docs/ssh-in-browser>), through port 22.
- Connections to your VM instance from third-party tools, such as a local terminal or PuTTY. Create a rule to allow access for the tool through your firewall. For more information, see [Connecting using third-party tools](/compute/docs/instances/connecting-advanced#thirdpartytools) (</compute/docs/instances/connecting-advanced#thirdpartytools>).

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) (/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 use Cloud Console, Cloud Shell, and Deployment Manager to deploy a VM instance with Linux and all of the persistent disks that SAP NetWeaver requires.

In these instructions, you define the resource options for your installation in a Deployment Manager configuration file template.

Deployment Manager treats all of the resources that are created for your SAP system as a single entity called a *deployment*. You can view and work with all of the deployments for your project on the [Deployments](https://console.cloud.google.com/dm/deployments) (https://console.cloud.google.com/dm/deployments) page in the Cloud Console.

Be aware of the following behaviors when using Deployment Manager:

- Deleting a deployment deletes all of the resources associated with the deployment, including the VMs, the persistent disks, and any SAP systems that are installed on the VM.
- By default, Deployment Manager uses the `ACQUIRE` resource creation policy. If you specify a VM name that is already in use by another VM in your project, Deployment Manager doesn't create a new VM, but instead adds the existing VM to your new deployment. If your original VM was created by a previous run of Deployment Manager, the VM is associated with two deployments.

If you then delete the new deployment, the acquired VM is deleted from the deployment that originally created it. To avoid such a scenario, either set the Deployment Manager resource policy to `CREATE`, or make sure that you use unique resource names in your new deployment.

For information about the policies you can use while creating resources with Deployment Manager and how to specify them, see the [Deployment Manager documentation](#) (`/deployment-manager/docs/deployments/#create-policy`).

1. Open Cloud Shell.

[Go to Cloud Shell](https://console.cloud.google.com/?cloudshell=true) (`https://console.cloud.google.com/?cloudshell=true`)

2. Download the `template.yaml` configuration file template to your working directory:

3. Optionally, rename the `template.yaml` file to identify the configuration it defines. For example, `nw-sles12sp3.yaml`.

4. To open the `template.yaml` file in Cloud Shell code editor, click the pencil () icon in the upper right corner of Cloud Shell terminal window to launch the editor.

5. In the `template.yaml` file, update the following property values by replacing the brackets and their contents with the values for your installation.

Property	Data type	Description
<code>instanceName</code>	String	The name of the VM instance on which SAP NetWeaver will be installed. The name must be 13 characters or less and be specified in lowercase letters, numbers, or hyphens. Use a name that is unique within your project.
<code>instanceType</code>	String	The type of Compute Engine virtual machine that you need. If you need a custom VM type, specify a small predefined VM type (<code>/solutions/sap/docs/netweaver-planning-guide#machine_types</code>) and, after deployment is complete, customize the VM (<code>/solutions/sap/docs/modifying_vm_configurations</code>) as needed.
<code>zone</code>	String	The zone in which you are deploying your SAP NetWeaver. It must be in the same region that you selected for your subnetwork.

Property	Data type	Description
<code>subnetwork</code>	String	The name of the subnetwork that you created in a previous step. If you are deploying to a shared VPC, specify this value as <code>[SHAREDVPC_PROJECT]/[SUBNETWORK]</code> . For example, <code>myproject/network1</code> .
<code>linuxImage</code>	String	The name of the Linux operating-system image or image family that you are using with SAP NetWeaver. To specify an image family, add the prefix <code>family/</code> to the family name. For example, <code>family/rhel-7-sap-hana</code> . For the list of available image families, see the Images (https://console.cloud.google.com/compute/images) page in the Cloud Console.
<code>linuxImageProject</code>	String	The Google Cloud project that contains the image you are going to use. This project might be your own project or a Google Cloud image project, such as <code>rhel-sap-cloud</code> or <code>suse-sap-cloud</code> . For a list of Google Cloud image projects, see the Images (/compute/docs/images) page in the Compute Engine documentation.
<code>usrsapSize</code>	Integer	The size of the <code>/usr/sap</code> disk. The minimum size is 8 GB.
<code>sapmntSize</code>	Integer	The size of the <code>/sapmnt</code> disk. The minimum size is 8 GB.
<code>swapSize</code>	Integer	The size of the swap volume. The minimum size is 1 GB.
<code>networkTag</code>	String	Optional. A network tag that represents your VM instance for firewall or routing purposes. If you specify <code>publicIP: No</code> and do not specify a network tag, be sure to provide another means of access to the internet.
<code>publicIP</code>	Boolean	Optional. Determines whether a public IP address is added to your VM instance. The default is <code>Yes</code> .
		<p>★ Note: Do not specify <code>No</code> unless you have a NAT gateway configured with a network tag defined for the VM or you have provided the VM with another route to the internet. If there is no route to the internet, the installation fails.</p>
<code>sap_deployment_debug</code>	Boolean	Optional. If this value is set to <code>Yes</code> , the deployment generates verbose deployment logs. Do not turn this setting on unless a Google support engineer asks you to enable debugging.

The following configuration file creates a VM that is configured to run SAP NetWeaver. The configuration file directs Deployment Manager to deploy the `n1-standard-16` VM that is running a SLES 12 SP2 operating system. The VM includes all of the directories that are required in order to run SAP NetWeaver.

6. Create the VM instance:

where:

- [DEPLOYMENT_NAME] represents the name of your deployment.
- [TEMPLATE_NAME] represents the name of your `template.yaml` file.

The preceding command invokes the Deployment Manager, which deploys the VM according to the specifications in your `template.yaml` file. The process may take a few minutes. To check the progress of your deployment, follow the steps in the next section.

7. After the VM instance deploys, if you need Compute Engine to save the boot disk in the event the VM instance is deleted:

- a. In the Cloud Console, go to the **VM Instances** page.

[Go to the VM Instances page \(https://console.cloud.google.com/compute/instances\)](https://console.cloud.google.com/compute/instances)

- b. To open the **VM instance details** page for your VM instance, click the name of the VM instance.
- c. Under **Boot disk and local disks**, clear the **Delete boot disk when instance is deleted** checkbox.

The following steps use Logging, which might incur charges. For more information, see [Stackdriver pricing \(/stackdriver/pricing_v2\)](#).

1. Open Stackdriver Logging to check for errors and monitor the progress of the installation.

[Go to Logging \(https://console.cloud.google.com/logs/viewer\)](https://console.cloud.google.com/logs/viewer)

2. On the **Resources** tab, select **Global** as your logging resource. If **INSTANCE DEPLOYMENT COMPLETE** is displayed for a VM, Deployment Manager processing is complete for the VM.

Global	All logs	Any log level	Last hour	Jump to now
Showing logs from the last hour ending at 5:05 PM (PDT)				
▶		2018-06-14 17:04:23.062 PDT	ex-vm-nw-lin Deployment	"Creating static IP address 10.1.0.7 in subnetwork example-sub-network-sap"
▶		2018-06-14 17:04:24.862 PDT	ex-vm-nw-lin Deployment	"Installing SAP NetWeaver monitoring agent"
▶		2018-06-14 17:04:39.729 PDT	ex-vm-nw-lin Deployment	"Creating file systems for SAP NetWeaver"
▶		2018-06-14 17:04:40.308 PDT	ex-vm-nw-lin Deployment	"--- /usr/sap"
▶		2018-06-14 17:04:44.918 PDT	ex-vm-nw-lin Deployment	"--- /sapmnt"
▶		2018-06-14 17:04:49.441 PDT	ex-vm-nw-lin Deployment	"--- swap volume"
▶		2018-06-14 17:04:50.199 PDT	ex-vm-nw-lin Deployment	"INSTANCE DEPLOYMENT COMPLETE"

3. After the VM instance deploys, connect to your VM by using `ssh`.

- a. If you haven't already done so, [create a firewall rule \(#adding_firewall_rules\)](#) to allow an SSH connection on port 22.
- b. Go to the **VM Instances** page.

[Go to the VM Instances page \(https://console.cloud.google.com/compute/instances\)](https://console.cloud.google.com/compute/instances)

- c. Click **SSH** for your VM instance, or you can use your preferred SSH method.

<input type="checkbox"/>	Name ^	Zone	Internal IP	External IP	Connect
<input type="checkbox"/>	ex-vm-nw-lin	us-central1-f	10.1.0.7 (nic0)	35.192.190.208	SSH ▾ ⋮

4. Change to the root user.

5. At the command prompt, enter `df -h`. Ensure that you see output similar to the following, such as the `//sybase/[DBSID]/sapdata` directory.

```
ex-vm-nw-lin:~ # df -h
Filesystem                Size      Used Avail Use% Mounted on
devtmpfs                   30G         0   30G   0% /dev
tmpfs                      45G         0   45G   0% /dev/shm
tmpfs                      30G       18M   30G   1% /run
tmpfs                      30G         0   30G   0% /sys/fs/cgroup
/dev/sda3                  30G       2.2G   26G   8% /
/dev/sda2                  200M       660K   200M   1% /boot/efi
/dev/mapper/vg_usr.sap-vol  15G        38M   14G   1% /usr/sap
/dev/mapper/vg_sapmnt-vol  15G        38M   14G   1% /sapmnt
```

6. Confirm that the swap directory was created:

You see results similar to the following example:

```
ex-vm-nw-lin:~ # cat /proc/meminfo | grep Swap
SwapCached:                0 kB
SwapTotal:                 25161724 kB
SwapFree:                  25161724 kB
```

If any of the validation steps show that the installation failed:

1. Correct the error.
2. On the [Deployments](https://console.cloud.google.com/dm/deployments) (https://console.cloud.google.com/dm/deployments) page, delete the deployment to clean up the VMs and persistent disks from the failed installation.
3. Rerun your deployment.

If you have [defined a firewall rule](#) (#adding_firewall_rules) that allows access on port 22, you can connect to a Linux VM using common SSH tools.

Google Cloud provides two connection methods. You can connect through the Cloud Console or you can connect from a terminal by using a `gcloud` command.

New VMs can take some time to boot up before an SSH connection is established. If you fail to connect to a new instance after a few minutes.

You can also generate a new key-pair for your Linux VM and apply it to your project, which allows you to connect using third-party tools such as [PuTTY on Windows workstations](#) (/compute/docs/instances/connecting-advanced#thirdpartytools). For more details, see [Creating a new SSH key pair](#) (/compute/docs/instances/adding-removing-ssh-keys#createsshkeys).

Other connection options, which aren't discussed here, are also possible.

For more detailed information about connecting to a Linux VM on Google Cloud, see [Connecting to Linux instances](/compute/docs/instances/connecting-to-instance#gctools) (/compute/docs/instances/connecting-to-instance#gctools).

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

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.

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 station 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 2446441 - Linux on Google Cloud \(IaaS\): Adaptation of your SAP License](https://launchpad.support.sap.com/#/notes/2446441) (https://launchpad.support.sap.com/#/notes/2446441).

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 [2460297 - SAP on Linux on Google Cloud Platform: Enhanced Monitoring](https://launchpad.support.sap.com/#/notes/2460297) (https://launchpad.support.sap.com/#/notes/2460297).
- 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. In the Cloud Console, open Cloud Shell.

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

2. Connect to the VM instance you want to monitor. For details on how to connect, see [Connecting to your VM](#) (#connecting_to_your_vm).
3. At the command prompt, enter the following command:

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).

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

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.

If you are having issues connecting to your VM through `ssh`, ensure that you have created a firewall rule to open port 22 on the Google Cloud network you are using.

For other possible issues, see Known issues ([/compute/docs/ssh-in-browser#known_issues](#)) for SSH from the browser.

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