Virtual network requirements

The VNet that you deploy your Azure Databricks workspace to must meet the following requirements:

Region: The VNet must reside in the same region as the Azure Databricks workspace.

Subscription: The VNet must be in the same subscription as the Azure Databricks workspace.

Address space: A CIDR block between /16 and /24 for the VNet and a CIDR block up to /26 for the two subnets: a container subnet and a host subnet.

Subnets: The VNet must include two subnets dedicated to your Azure Databricks workspace: a container subnet (sometimes called the private subnet) and a host subnet (sometimes called the public subnet). However, for a workspace that uses secure cluster connectivity, both the container subnet and host subnet are private. It is unsupported to share subnets across workspaces or deploy other Azure resources on the subnets that are used by your Azure Databricks workspace.

The CIDR range for your VNet address space affects the maximum number of cluster nodes that your workspace can use:

* An Azure Databricks workspace requires two subnets in the VNet: a container subnet (also known as private subnet) and a host subnet (also known as public subnet). If the workspace uses [secure cluster connectivity](https://learn.microsoft.com/en-us/azure/databricks/security/secure-cluster-connectivity), both container and host subnets are private.
* Azure reserves [five IPs in each subnet](https://learn.microsoft.com/en-us/azure/virtual-network/virtual-networks-faq#are-there-any-restrictions-on-using-ip-addresses-within-these-subnets).
* Within each subnet, Azure Databricks requires one IP address per cluster node. In total, there are two IP for each cluster node: one IP address for the host in the host subnet and one IP address for the container in the container subnet.
* You may not want to use all the address space of your VNet. For example, you might want to create multiple workspaces in one VNet. Because you cannot share subnets across workspaces, you may want subnets that do not use the total VNet address space.
* You must allocate address space for two new subnets that are within the VNet’s address space and don’t overlap address space of current or future subnets in that VNet.

The following table shows maximum subnet size based on network size. This table assumes no additional subnets exist that take up address space. Use smaller subnets if you have pre-existing subnets or if you want to reserve address space for other subnets:

| **VNet address space (CIDR)** | **Maximum Azure Databricks subnet size (CIDR) assuming no other subnets** |
| --- | --- |
| /16 | /17 |
| /17 | /18 |
| /18 | /19 |
| /20 | /21 |
| /21 | /22 |
| /22 | /23 |
| /23 | /24 |
| /24 | /25 |

To find the maximum cluster nodes based on the subnet size, use the following table. The IP addresses per subnet column includes the [five Azure-reserved IP addresses](https://learn.microsoft.com/en-us/azure/virtual-network/virtual-networks-faq#are-there-any-restrictions-on-using-ip-addresses-within-these-subnets). The rightmost column indicates the number of cluster nodes that can simultaneously run in a workspace that is provisioned with subnets of that size.

| **Subnet size (CIDR)** | **IP addresses per subnet** | **Maximum Azure Databricks cluster nodes** |
| --- | --- | --- |
| /17 | 32768 | 32763 |
| /18 | 16384 | 16379 |
| /19 | 8192 | 8187 |
| /20 | 4096 | 4091 |
| /21 | 2048 | 2043 |
| /22 | 1024 | 1019 |
| /23 | 512 | 507 |
| /24 | 256 | 251 |
| /25 | 128 | 123 |
| /26  With secure cluster connectivity enabled, customer virtual networks have no open ports and Databricks Runtime cluster nodes have no public IP addresses. Secure cluster connectivity is also known as No Public IP (NPIP).  At a network level, each cluster initiates a connection to the control plane secure cluster connectivity relay during cluster creation. The cluster establishes this connection using port 443 (HTTPS) and uses a different IP address than is used for the Web application and REST API.  When the control plane logically starts new Databricks Runtime jobs or performs other cluster administration tasks, these requests are sent to the cluster through this tunnel.  The data plane (the VNet) has no open ports, and Databricks Runtime cluster nodes have no public IP addresses. | 64 | 59 |