

# Calculate Subnet Requirements

Last updated by | Zoltan Toth | Nov 6, 2024 at 9:32 AM GMT+1

## Not using CNI Overlay

One needs to consider the values of specific fields to determine the **minimum** size of a Subnet an AKS cluster can use:

- `maxCount` if autoscaling is *enabled*, `count` if autoscaling is *disabled*.  
One needs the **maximum, total** number of Nodes **all** the cluster's node pool will scale out to as a whole.  
Ignore whether or not the node pool will autoscale, consider instead the largest number of Nodes you will **ever** need to scale out to.
- `maxPods` .  
One needs the [maximum number of Pods allowed to run on any one Node at any time](#) .  
The default value is `30` .

Once you have them, calculate the **minimum** number of IP addresses required by any **one node pool** using the following formula:

$$\text{ipAddressNumber} = (\text{maxPods} * (\text{maxCount} + 1)) + (\text{maxCount} + 1)$$


where:

$(\text{maxPods} * (\text{maxCount} + 1))$  is the total number of Pods for all Nodes  
 $(\text{maxCount} + 1)$  is the total number of Nodes

Since node pools can have different values, if you plan to have more than one node pool the resulting number of **each** needs to be added together.

To this, you will **also** need to add `5` , which is the number of [reserved IP addresses in an Azure Subnet](#) .

For example:

- You want a **single** node pool with a maximum of **5** Nodes, each capable of hosting up to **30** Pods.  
The number of IP addresses you require will be  $(30 * (5+1)) + (5+1) + 5 = (30*6) + 6 + 5 = 191$  .  
This means the Subnet size must be `/24` or bigger.
- You want **2** node pools.  
The first, with a maximum of **3** Nodes, each capable of hosting up to **45** Pods.  
The second, with a maximum of **5** Nodes, each capable of hosting up to **30** Pods.  
The number of IP addresses you require will be  $184 + 191 + 5 = 380$  , where:
  - $(45 * (3+1)) + (3+1) = (45*4) + 4 = 184$  are used by the first node pool.
  - $(30 * (5+1)) + (5+1) = (30*6) + 6 = 191$  are used by the second node pool.

This means you need (either/or):

- A single Subnet which size must be `/23` or bigger.
- 2 `/24` or bigger Subnets: one for the first node pool, one for the second.

## Using CNI Overlay

With the [CNI Overlay](#) feature enabled, Pods are assigned IP addresses from the dedicated, separated, private Subnet specified during creation.

For this reason, the number of Pods will **not** impact on the Subnet size.

The cluster's Nodes will **still** use the IP addresses from the SSNS Subnet pool.

One needs to consider the value of only one specific field to determine the **minimum** size of a Subnet an AKS cluster can use:

- `maxCount` if autoscaling is *enabled*, `count` if autoscaling is *disabled*.  
One needs the **maximum, total** number of Nodes **all** the cluster's node pool will scale out to as a whole.  
Ignore whether or not the node pool will autoscale, consider instead the largest number of Nodes you will **ever** need to scale out to.

Once you have it, calculate the **minimum** number of IP addresses required by any **one node pool** using the following formula:

$$\text{ipAddressNumber} = (\text{maxCount} + 2)$$



where:

$(\text{maxCount} + 2)$  is the total number of Nodes + 1 ip for node upgrade and 1 ip for Ingress controller

Since node pools can have different values, if you plan to have more than one node pool the resulting number of **each** needs to be added together.

To this, you will **also** need to add 5, which is the number of [reserved IP addresses in an Azure Subnet](#).

For example:

- You want a **single** node pool with a maximum of **5** Nodes.  
The number of IP addresses you require will be  $(5 + 2) + 5 = (7 + 5) = 12$ .  
This means the Subnet size must be /28 or bigger.
- You want **2** node pools.  
The first, with a maximum of **3** Nodes.  
The second, with a maximum of **8** Nodes.  
The number of IP addresses you require will be  $(5 + 5) + (10 + 5) = 25$ , where:
  - $(3 + 2) + 5 = 10$  are used by the first node pool.
  - $(8 + 2) + 5 = 15$  are used by the second node pool.

This means you need (either/or):

- A single Subnet which size must be /28 or bigger.
- one /28 or bigger Subnet for the first node pool, one /27 or bigger Subnet for the second node pool.