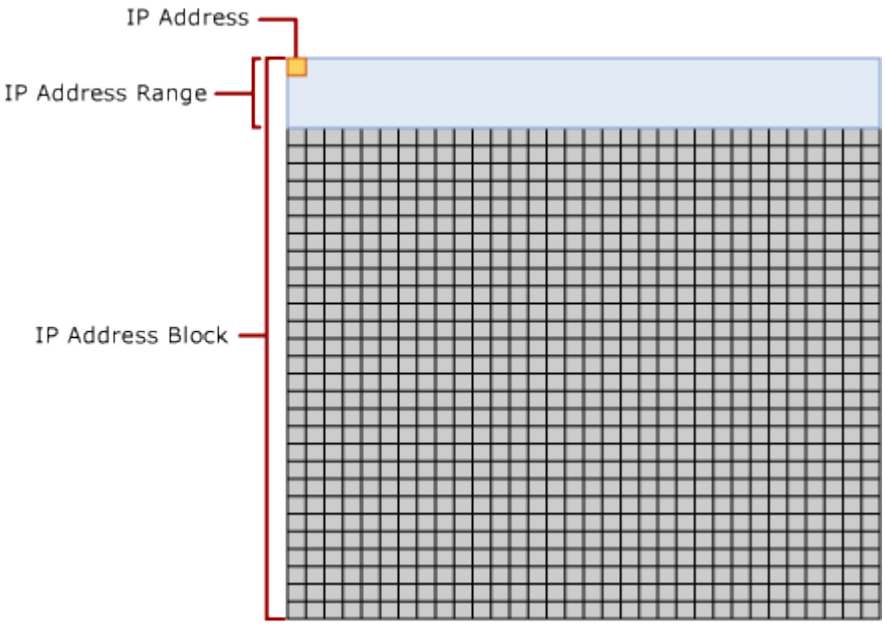
IPAM - CREATE AND MANAGE IP BLOCKS AND RANGES

Address space management

In IPAM, IP address blocks are large chunks of IP addresses that are used for organization of address space. IP address ranges are smaller chunks of IP addresses that typically correspond to a DHCP scope. IP address ranges are mapped to IP address blocks.



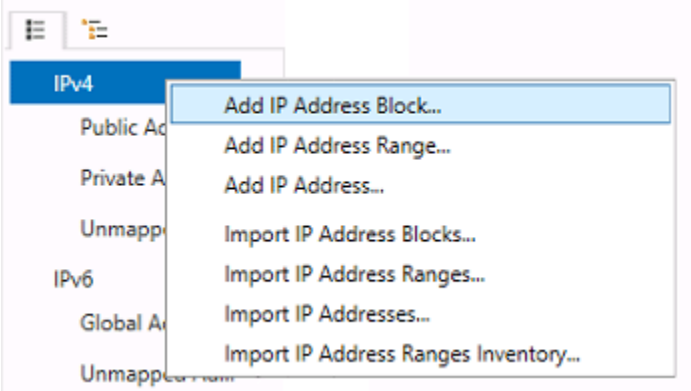
IP addresses can be entered into IPAM manually, or by importing from a comma-delimited file. Addresses can also be exported to a file in comma-delimited format.

Create, delete, import and export IP addresses

The following procedure demonstrates how IP address blocks, ranges, and addresses can be created, deleted, exported, and imported in IPAM.

To create, delete, import, and export IP addresses

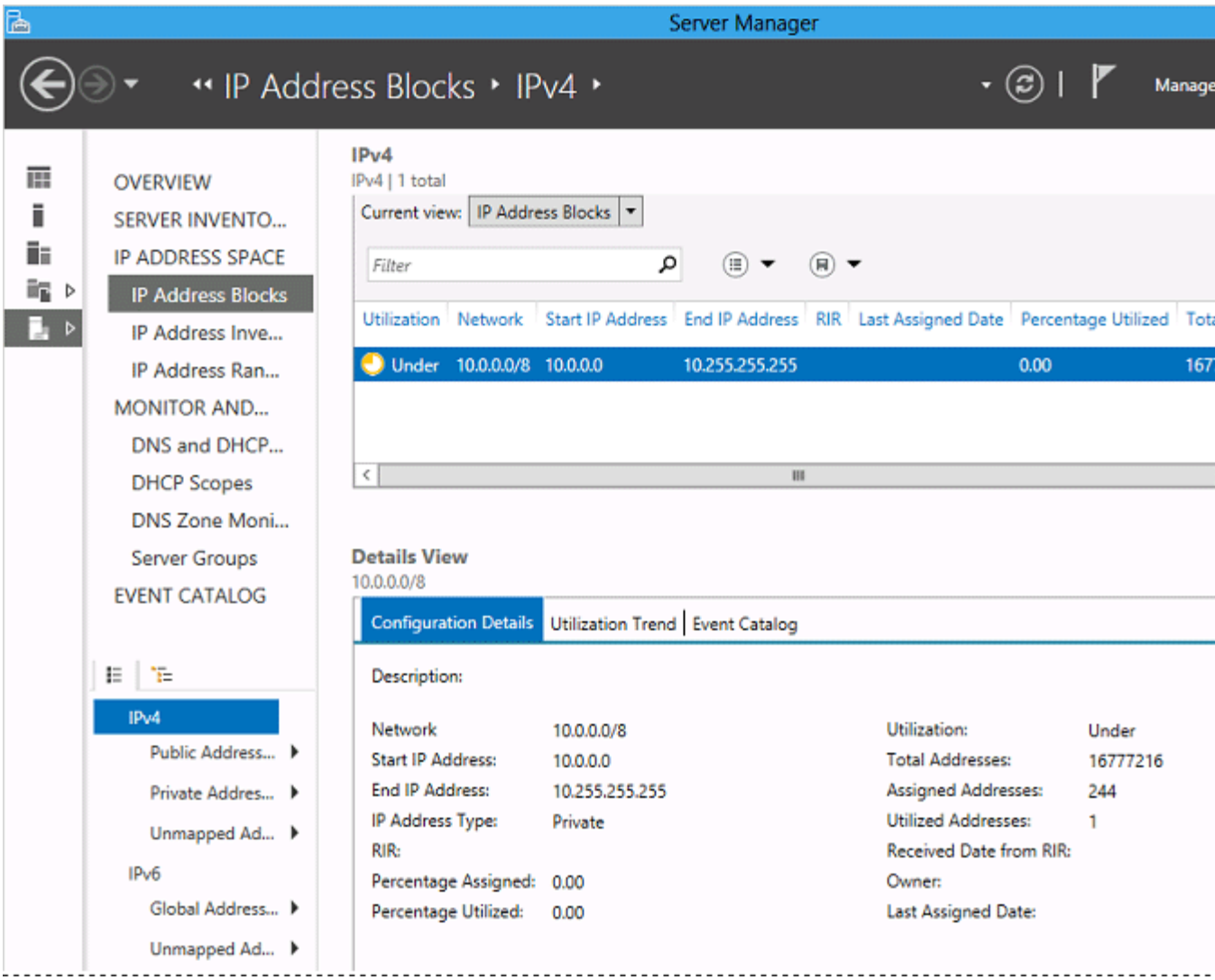
1. In the upper IPAM navigation pane, click **IP Address Blocks**.
2. In the lower navigation pane, right-click **IPv4** and then click **Add IP Address Block**.



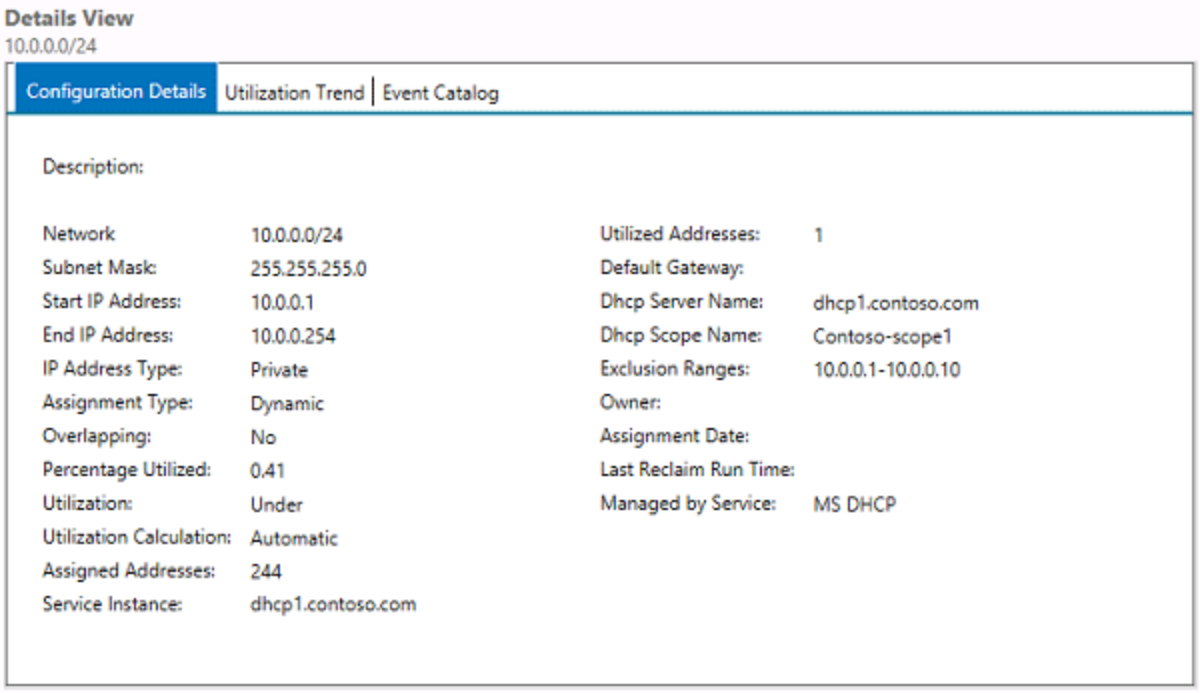
Note

The IP address block you create is automatically added to public or private address space according to the start and end IP addresses you specify.

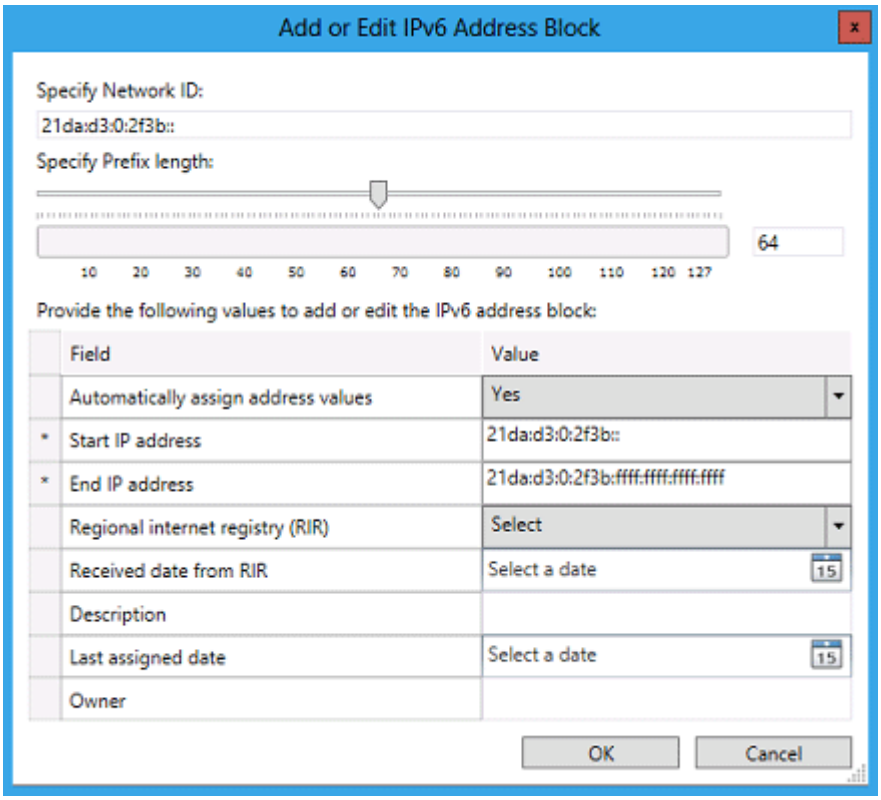
3. In the **Add or Edit IPv4 Address Block** dialog box, next to **Network ID**, type **10.0.0.0**.
4. Next to **Prefix Length**, choose **8**. This is the /8 corresponding to the /24 subnet that is being dynamically allocated by DHCP1.
5. Click **OK**, and then next to **Current View** choose **IP Address Blocks**.



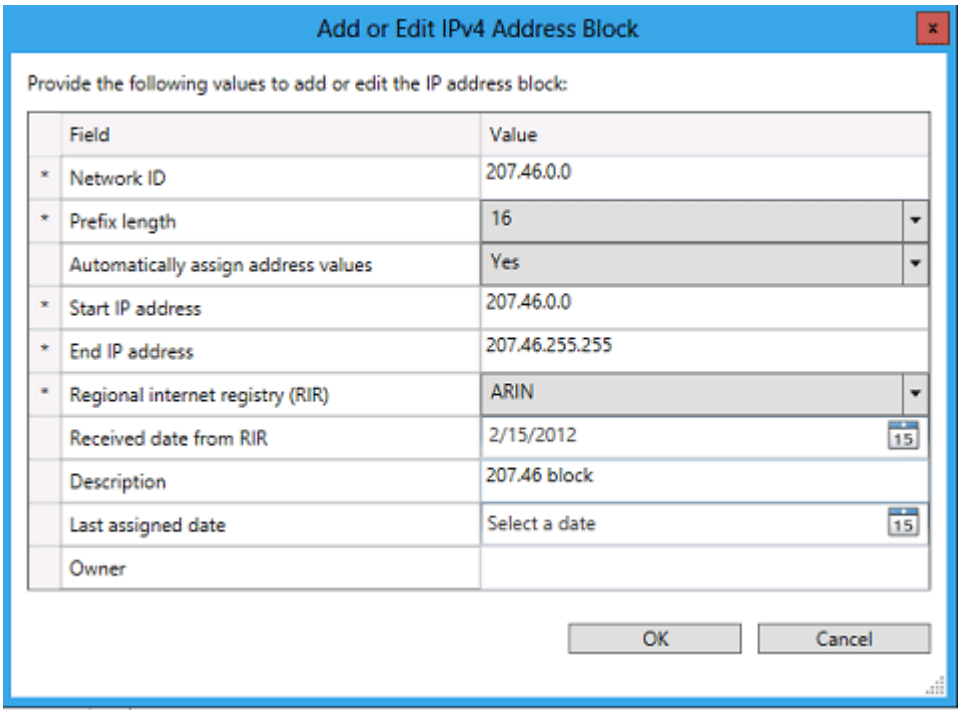
6. On the **Configuration Details** tab, next to **Utilized Addresses**, note that one IP address is currently in use. This corresponds to the lease issued by DHCP1 for Client1.
7. Next to **Current view**, choose **IP Address Ranges**.
8. On the **Configuration Details** tab, review the information displayed. Details are provided for Contoso-scope1 supplied by dhcp1.contoso.com.



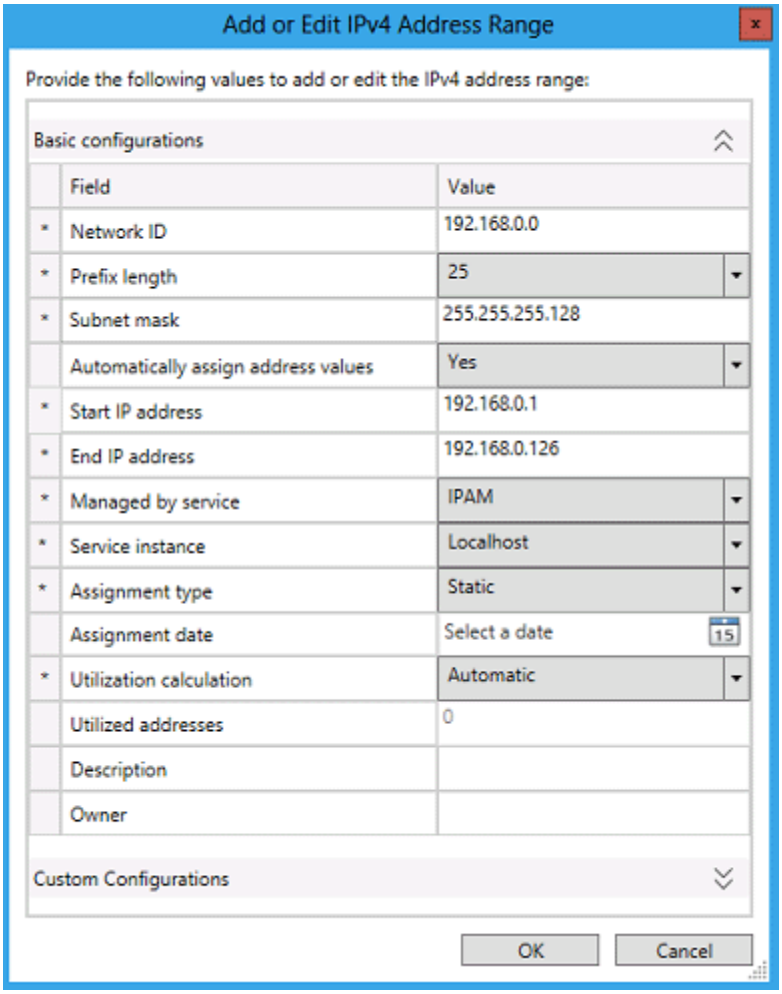
9. In the lower navigation pane, right-click **IPv6** and then click **Add IP Address Block**.
10. Under **Specify the Network ID**, type **21da:d3:0:2f3b::** and then move the slider next to **Specify Prefix length** to that the prefix is **64**, and then click **OK**.



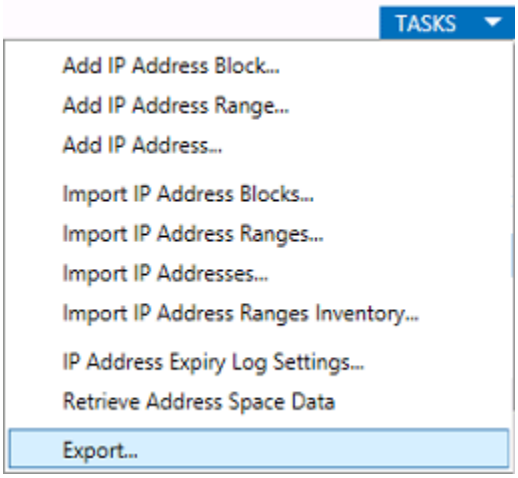
11. Choose **IP Address Blocks** next to **Current view** and confirm that the **21da:d3:0:2f3b::/64** block was successfully added.
12. Right-click **IPv4** and add the following IP address blocks:
    - **192.168.0.0/24**
    - **192.168.1.0/24**
13. Right-click **IPv4** and add the **207.46.0.0/16** address block. Since this is public address space, you must choose a regional Internet registry. Choose **ARIN**, and if desired, supply dates and a description for this block of public IP address space.



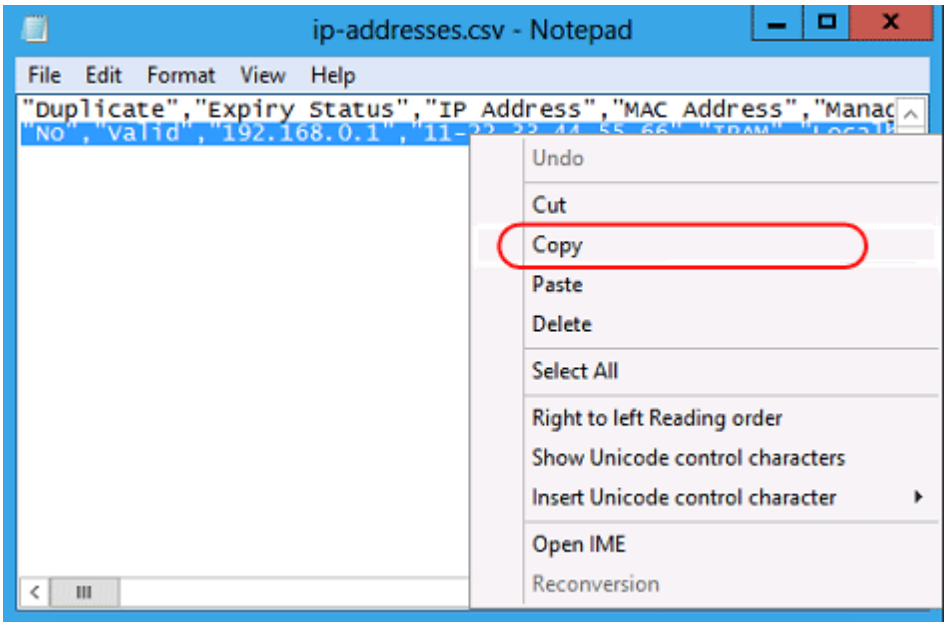
14. Ensure that the **Current view** selected is **IP Address Blocks** and click the **Network** field to sort by highest to lowest network ID. Also try sorting by some other fields.
15. In the lower navigation pane, under **IPv4**, click **Public Address Space** and verify that the **207.46.0.0/16** IP address block is displayed.
16. Right-click **IPv4** and then click **Add IP Address Range**.
17. Next to **Network ID**, type **192.168.0.0**, choose **25** next to **Prefix length**, and then click **OK**.



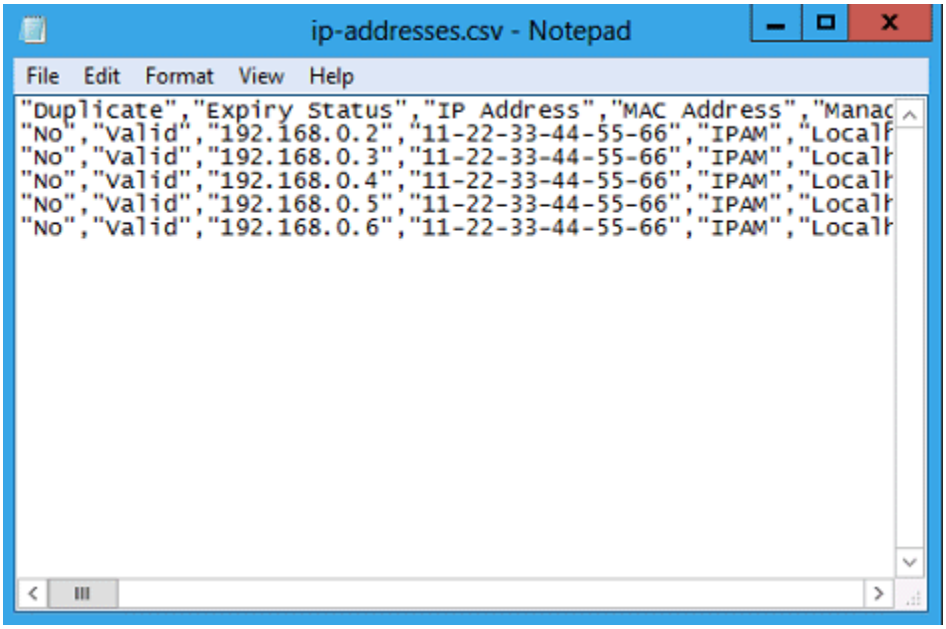
18. Right-click IPv4 and add the following IP address ranges:
    - **192.168.0.128/25**
    - **192.168.1.0/25**
    - **192.168.1.128/25**
19. Right-click **IPv4**, and then click **Add IP Address**.
20. In the **Add IP Address** dialog box, next to **IP address**, type **192.168.0.1**.
21. Next to **MAC address**, type **112233445566** and then click **OK**.
22. Next to **Current view**, choose **IP Addresses** and verify that the static IP address **192.168.0.1** was added, and that it is automatically assigned to the **192.168.0.1-192.168.0.126** range.
23. With the current view set to IP Addresses, click TASKS and then click Export.



24. Choose a location where you want to save the file.
25. In the **Save As** dialog box, type **ip-addresses** next to **File name** and then click **Save**.
26. Right-click the **ip-addresses.csv** file and then click **Edit**.
27. Highlight the line containing the 192.168.0.1 IP address, right-click the line, and then click **Copy**.



28. Paste the contents of the copied line underneath the text four times, so that you create a total of six rows of text, with the first row containing the column headers.
29. Change the IP address in all five lines from 192.168.0.1 to values ranging from 192.168.0.2 – 192.168.0.6 and then save the file.



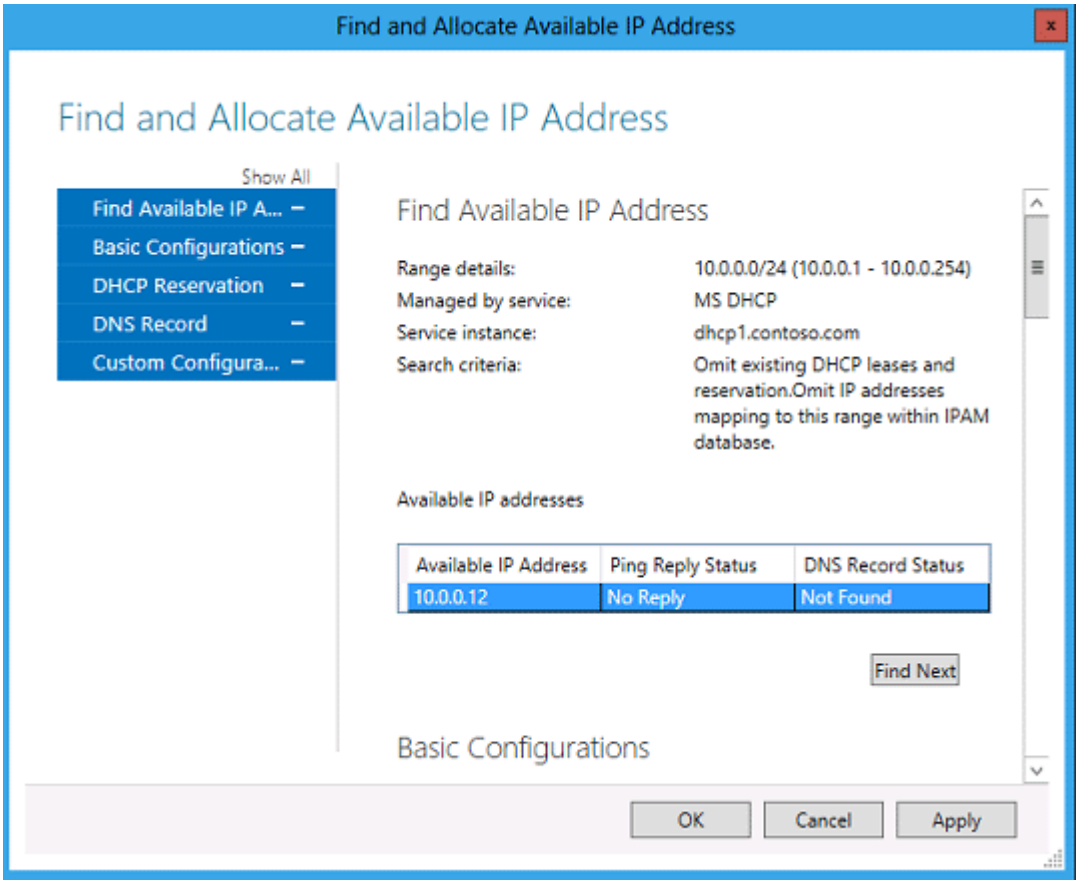
30. Right-click **IPv4** and then click **Import IP Addresses**.
31. Select the **ip-addresses.csv** file and then click **Open**.
32. In the **Import IP Addresses** dialog box, verify that **5 out of 5 records successfully imported** is displayed, and then click OK.
33. Verify that five new IP addresses were added to the **192.168.0.1-192.168.0.126** range.
34. Right-click the **192.168.0.6** IP address and then click **Delete**.
35. Verify that the 192.168.0.6 IP address was removed from the list.

Find available IP addresses and create reservations

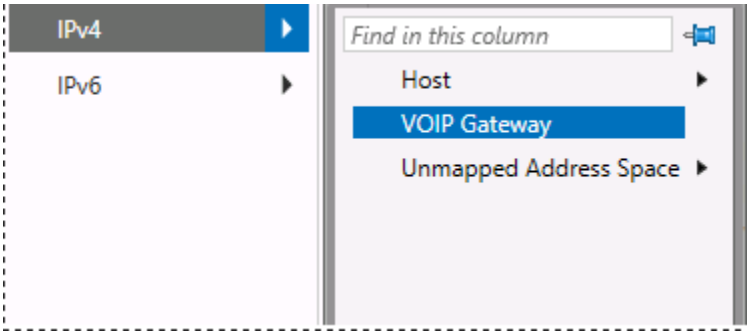
A network administrator might wish to locate an available IP address and use it for static assignment to a network device. The following steps demonstrate how to use the **Find and Allocate Available IP Address** function in IPAM for this scenario.

To find, reserve, and reclaim IP addresses

1. With the **Current view** set to **IP Address Ranges**, right-click the 10.0.0.1/24 range that is assigned by DHCP1 and then click **Find and Allocate Available IP Address**.
2. Because the first ten IP addresses are reserved in the Contoso-scope1 DHCP scope, and Client1 has been allocated the first available IP address, the first available IP address will be 10.0.0.12.
3. Wait a few seconds for **Ping Reply Status** and **DNS Record Status** to resolve and display **No Reply** and **Not Found**, respectively.



4. Click **Basic Configurations**.
5. Next to **MAC address**, type **112233445566** and next to **Device type** choose **VOIP Gateway**.
6. Click **DHCP Reservation**.
7. Next to **Reservation server name**, choose **dhcp1.contosoc.com**. The **Reservation scope name** will automatically display **Contoso-scope1**.
8. Next to **Reservation name**, type **voip-gw**, and then next to **Reservation type**, choose **Both**.
9. Click **DNS Record**.
10. Next to **Device name**, type **voip-gw**, next to **Forward lookup zone**, choose **contoso.com**, and then next to **Forward lookup primary server** choose **DC1.contoso.com**.
11. If a reverse lookup zone has not been created yet, no in-addr.arpa zone is available to select.
12. Click **OK**, and then in the IPAM navigation pane under **IP ADDRESS SPACE**, click **IP Address Inventory**.
13. In the lower navigation pane, click the arrow next to **IPv4** to expand IPv4 and then click **VOIP Gateway**.

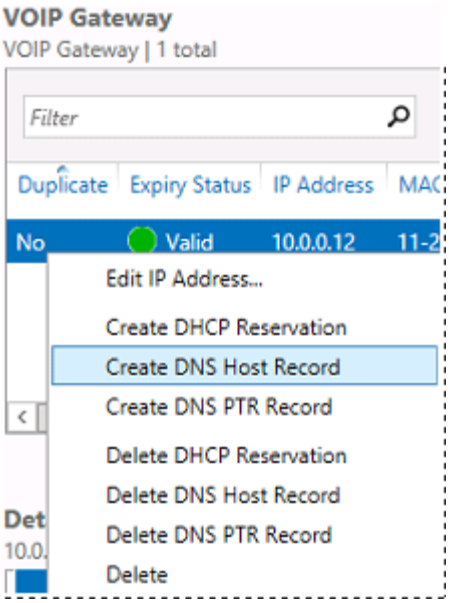


14. Verify that the **10.0.0.12** IP address is displayed.

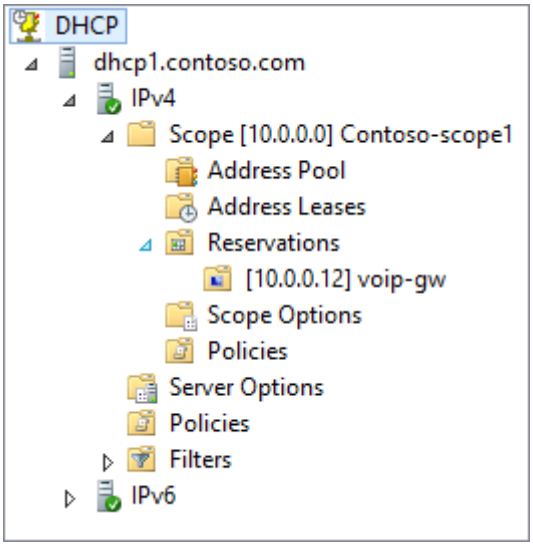
Tip

So far, changes have only been made to the IPAM database. The following steps will be used to create a DHCP reservation and DNS host record.

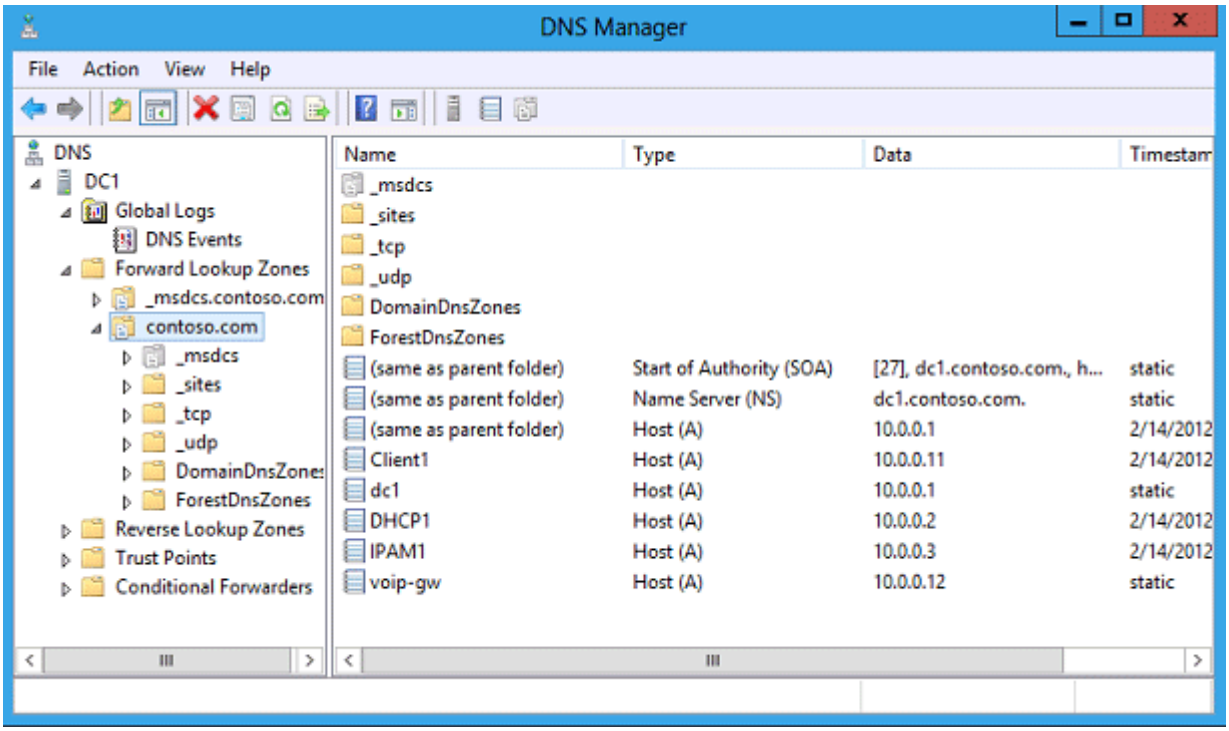
15. Right-click the 10.0.0.12 IP address and then click **Create DNS Host Record**.



16. Right-click the 10.0.0.12 IP address and then click **Create DHCP Reservation**.
17. On the **Configuration Details** tab, verify that **Create Success** is displayed next to **DHCP reservation sync** and **DNS Host Record sync**.
18. On DHCP1, in the DHCP console, verify that the reservation is present in the Contoso-scope1 DHCP scope.



19. On DC1, in DNS Manager, verify that the host record is present.



20. On IPAM1, right-click the 10.0.0.12 IP address and then click **Edit IP Address**.
21. Under **Basic Configurations**, click **Select a date** next to **Assignment date** and enter today's date.
22. Click **Select a date** next to **Expiry date**, select a date one month from today, and then click **OK**.

Important

Expiry settings are alerts you can create for objects in the IPAM database. When a

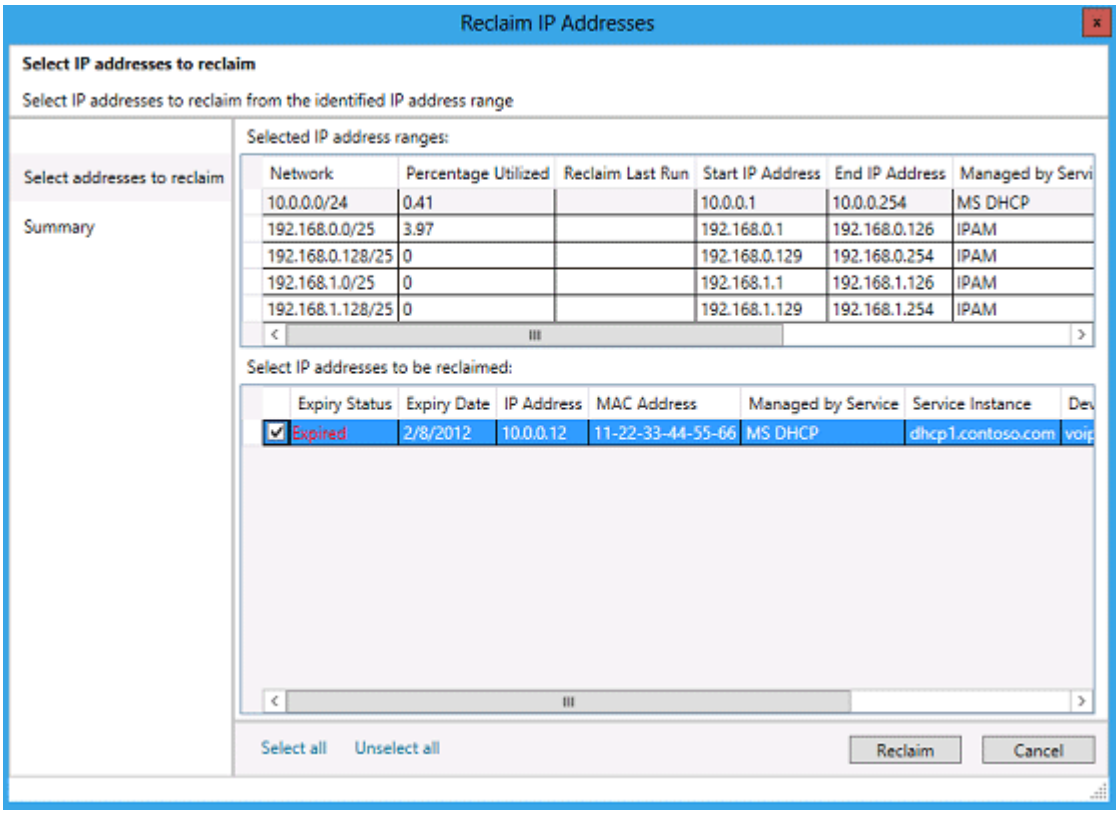
reserved IP address passes the expiry date, it is not removed from reservations on the DHCP server, but IPAM will provide events and alerts when the expiry date is close.

23. Verify that **Valid** is displayed under **Expiry Status**.
24. Click **TASKS** and then click **IP Address Expiry Log Settings**.
25. Under **Expiry Alert Threshold**, type **31**.
26. Under **Logging Frequency**, choose **Log all expiry status messages periodically** and then click OK.

Tip

By default, expiry logging begins 10 days before the expiration date. When you choose to log alerts periodically, they will be logged each time the expiry task runs. The expiry task runs once each day by default, but can be configured to run more or less frequently.

27. Refresh the IPAM console view and verify that **Expiry Due** is displayed under **Expiry Status**.
28. Edit the IP address again and change the assignment date and expiry date to one week in the past. Verify that the address is now displayed as **Expired**.
29. Right-click the 10.0.0.12 address and then click **Delete DHCP Reservation**. This removes the DHCP reservation from the DHCP server.
30. Right-click the 10.0.0.12 address and then click **Delete DNS Host Record**. This removes the forward lookup record from the authoritative DNS server.
31. Click **IP Address Blocks** in the IPAM navigation pane and change the current view to **IP Address Ranges**.
32. Highlight all the available ranges by holding down the SHIFT key and clicking the top and bottom ranges.
33. Right-click the highlighted IP address ranges, and then click **Reclaim IP Addresses**.
34. Under **Select IP addresses to be reclaimed**, select the checkbox next to the 10.0.0.12 address, click **Reclaim** and then click **Close**. This removes the IP address from the IPAM database.



Tip

Reclaiming IP addresses allows you visualize expiry status and delete multiple IP addresses. You can also right-click one or more IP addresses and click **Delete** to remove IP addresses from the IPAM database.

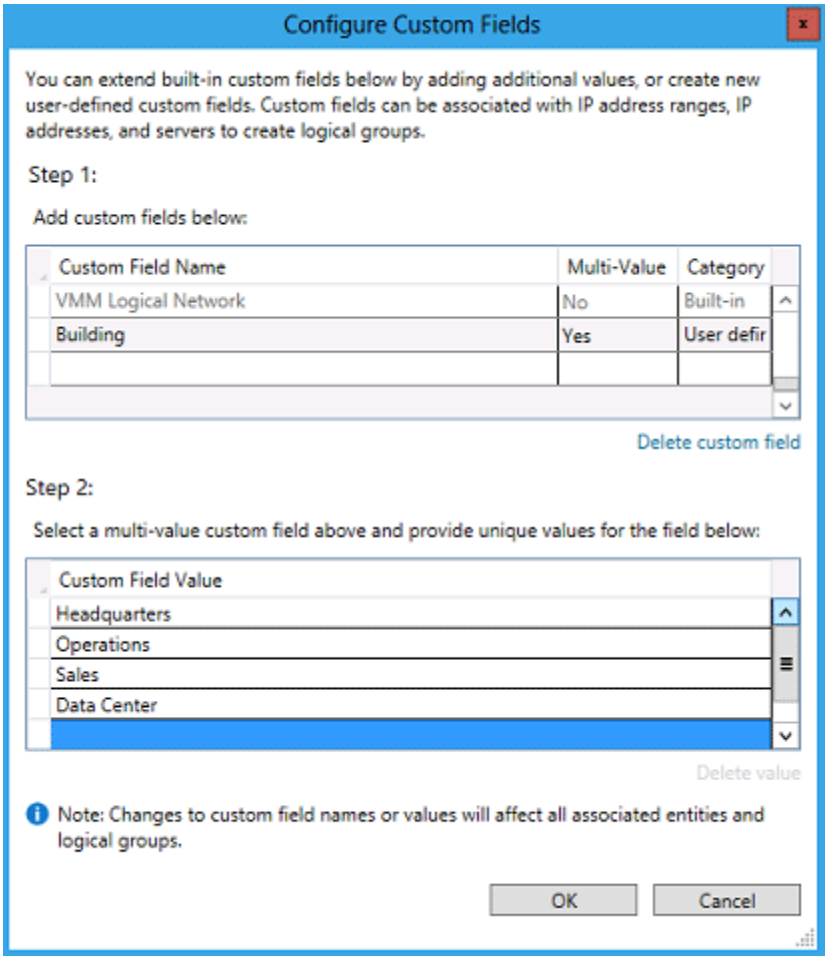
Create custom logical groups

The **IP Address Inventory** group is a built-in group with IP addresses organized by device type. In addition, IPAM allows you to create custom logical groups. To create custom groups:

To create custom logical groups

1. In the IPAM navigation pane, under **IP ADDRESS SPACE**, click **IP Address Range Groups**.
2. On the Server Manager menu, click **Manage** and then click **IPAM settings**.
3. In the **IPAM settings** dialog box, click **Configure custom fields**.
4. In the **Configure Custom Fields** dialog box, under **Add custom fields below**, scroll to the bottom of the list, type **Building** for the **Custom Field Name**, and then select **Yes** under **Multi-Value**.
5. Press ENTER or TAB to commit the new custom field name. A blank line will open that can be used for additional custom fields.
6. Click **Building** and then under **Custom Field Value** type the following values. Press ENTER after you type each one:

1. **Headquarters**
2. **Operations**
3. **Sales**
4. **Data Center**



7. Repeat the previous step to add another custom field named **Floor** with the following two custom field values:
   - **First**
   - **Second**
8. Click **OK** twice, and then click **Close**.
9. Click **IP Address Ranges**, right-click the **192.168.0.0/25** range, and then click **Edit IP Address Range**.
10. Click **Custom Configurations**, and then next to **Custom field to configure**, choose **Building**.
11. Next to Specify a value, choose **Headquarters** and then click **Add**.

12. Choose **Floor** next to **Custom field to configure**, choose **First**, and then click **Add**.
13. Edit the other three IP address ranges and add a unique building and a floor to each.

> **Tip**
>
> You can also select multiple IP address ranges and add custom fields to all the ranges in one step.

14. Refresh the IP Address Ranges view, right-click the column header and then select **Building** and **Floor** two of the fields to display. The building and floor is now displayed with each IP address range in the list.
15. Right-click **IPv4** and then click **Add IP Address Range Group**.
16. Under **Provide name of the address range group**, type **Building/Floor**.
17. Under **Custom Fields**, select **Building** and then select **Floor** so that items are grouped first by Building and then by Floor.
18. Click OK, and then click the arrow next to IPv4.
19. Verify that you can view IP address ranges by building and floor.