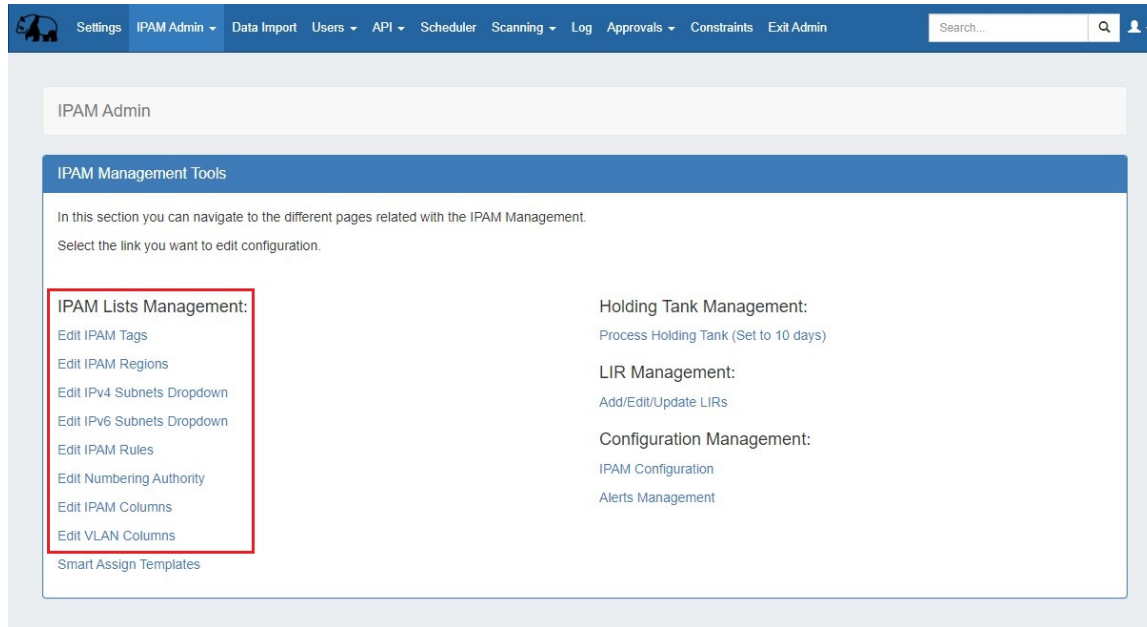


# IPAM Parameters

## IPAM Lists Management - Overview

IPAM Lists Management is accessed from the Admin section, under the [IPAM Admin](#) tab.

Through this area, admin users can update IPAM tags, IPAM Regions, IPv4 / IPv6 subnets, IPAM Rules, Numbering Authority, and IPAM / VLAN Columns.



- [Add / Edit IPAM Tags](#)
- [Add / Edit Regions](#)
  - [Applying a Geocoding API Key:](#)
  - [Managing Regions](#)
    - [Valid / Invalid Regions](#)
    - [Fill Empty Region Locations](#)
    - [Region Resource Generation](#)
- [Add / Edit IPv4 / IPv6 Subnet Dropdowns](#)
- [Edit IPAM Rules](#)
- [Numbering Authority](#)
  - [Available Domain Types](#)
  - [Working with Numbering Domains](#)
    - [Create a Numbering Domain](#)
    - [Number Domain Actions](#)
- [Edit IPAM or VLAN Columns](#)
  - [Adding Constraints to IPAM Columns](#)
- [Additional Information](#)

## Add / Edit IPAM Tags

When you are applying properties to IP blocks, you have the option to edit tags. IPAM Tags are used in a number of areas and can be added or edited from this screen.

To add a new IPAM tag, type the desired name value for the new tag in the box at the top of the Edit IPAM Tags page and click "Add".

Tags 53

Manage tags settings globally for all users. Add, edit, remove and reorder tags by clicking and dragging into the desired order. You can also order them alphabetically by clicking the Sort button. Save to persist changes.

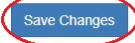
Options  Sort Alphabetically  

New Tag 

|                                                                                   |                |                                                                                     |                                                                                     |
|-----------------------------------------------------------------------------------|----------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|  | Another QA Tag |  |  |
|  | DHCP Available |  |  |
|  | Test Tag 27    |  |  |
|  | Test Tag 3008  |  |  |
|  | Alpha          |  |  |
|  | ActiveE DIA    |  |  |
|  | B              |  |  |

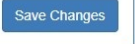
To **edit** a tag, simply type your changes in to the text box with the tag name.

|                                                                                    |                                         |                                                                                      |                                                                                      |
|------------------------------------------------------------------------------------|-----------------------------------------|--------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
|   | Internal                                |   |   |
|   | BugFixTest                              |   |   |
|  | <input type="text" value="PostQATest"/> |  |  |

Back to IPAM Admin 

To **reorder** the tag list, click and hold on the "list" icon (three lines) to the left of the tag name, then drag to the desired location in the list and release. You can also click the "Sort Alphabetically" button at the top.

|                                                                                     |            |                                                                                       |                                                                                       |
|-------------------------------------------------------------------------------------|------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
|  | Internal   |  |  |
|  | PostQATest |  |  |
|  | BugFixTest |  |  |

Back to IPAM Admin 

Tags 53

Manage tags settings globally for all users. Add, edit, remove and reorder tags by clicking and dragging into the desired order. You can also order them alphabetically by clicking the Sort button. Save to persist changes.

Options  Sort Alphabetically  



To **delete** a tag, click on the red "Delete" button to the right of the tag name.

|            |                        |
|------------|------------------------|
| Internal   | <a href="#">delete</a> |
| BugFixTest | <a href="#">delete</a> |
| PostQATest | <a href="#">delete</a> |

Back to IPAM Admin [Save Changes](#)

When complete, be sure to click on the "Save Changes" button to save your changes.

## Add / Edit Regions

If enabled, Regions can function as a way to further define your network segments (regional tie-downs, etc.). This gives you flexibility for allocations and assignments beyond simply using Tags. Regions are used by the [IPAM Gadget](#), the IPAM Manage UI, and IPAM Map View.

Access IPAM regions from [IPAM Admin](#) **Edit IPAM Regions**.

Edit Regions
Add Region
Geocode Api Key

Regions 24

Manage Regions
Items per page 10
Search by name...

| <input type="checkbox"/> | Region Code | Name                    | Address                         | Location Status |  |
|--------------------------|-------------|-------------------------|---------------------------------|-----------------|--|
| <input type="checkbox"/> | ASH         | Ashburn, VA             | Ashburn, VA                     |                 |  |
| <input type="checkbox"/> | AKL         | Auckland, NZ            | Auckland, New Zealand           |                 |  |
| <input type="checkbox"/> | BOS         | Boston, MA              |                                 |                 |  |
| <input type="checkbox"/> | CAI         | Cairo, Egypt            | Cairo, Cairo Governorate, Egypt |                 |  |
| <input type="checkbox"/> | CPT         | Cape Town, South Africa | Cape Town, South Africa         |                 |  |
| <input type="checkbox"/> | CMN         | Casablanca, Morocco     | Casablanca, Morocco             |                 |  |
| <input type="checkbox"/> | CHI         | Chicago, IL             | Chicago, IL, USA                |                 |  |
| <input type="checkbox"/> | DAL         | Dallas, TX              |                                 |                 |  |
| <input type="checkbox"/> | LIR         | Limerick, Ireland       | Limerick, Ireland               |                 |  |
| <input type="checkbox"/> | LJU         | Ljubljana, Slovenia     | Ljubljana, Slovenia             |                 |  |

Displaying 1 to 10 of 24 items.

Previous 1 2 3 Next

Back to IPAM Admin

The Regions display includes fields for Region Code, Name, and Address.

- 'Region Code' is the shorthand name that will show in the IPAM Gadget and IPAM Manage screens.
- 'Name' is the long form name value that will be written to the database, used for API calls, and is also used for some filter selectors.
- The 'Address' field is used by IPAM map view (via Geocode API) to geolocate aggregates with that assigned region. Address may be in the form of a City / State / Country, a full street address, a company name, or other search term that the Geocode API can return a location for. The more accurate your address information, the more accurate map view will be with your aggregate locations. To use regions, you will need to apply a Geocode API Key. An "address" value that appears invalid will display a yellow warning symbol.

## Applying a Geocoding API Key:

### Step 1: Obtain a Google Geocoding API Key

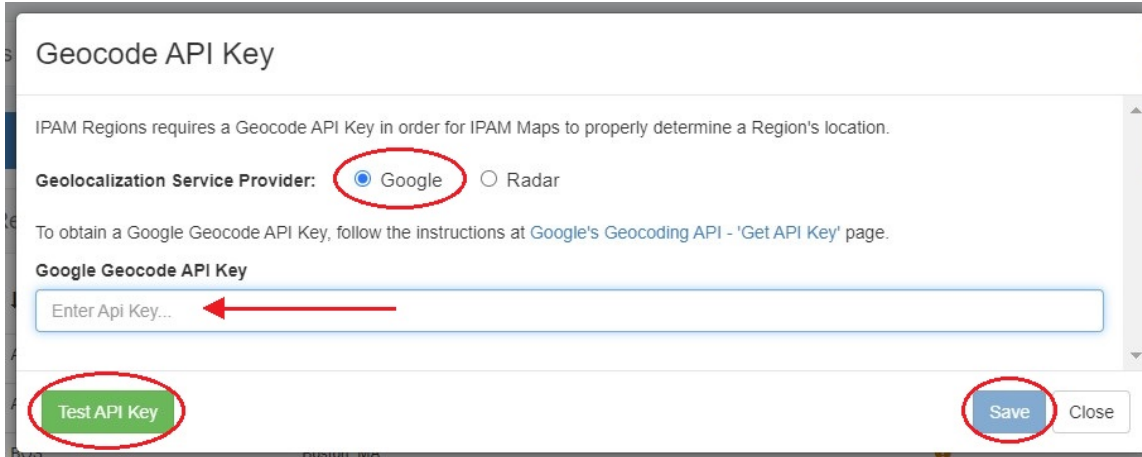
To get a Google Geocoding API Key, follow the instructions listed [here](#):

### How to get a Google Geocoding API Key

Note: In order to obtain a Google Geocoding API Key, a company must have a subscription enabled to Google Cloud Platform Console.

#### Step 2: Assign the API Key to IPAM Regions

Once assigned a Google Geocoding API Key, from the Edit Regions page, click "Geocode API Key". Then select the Google radio button, paste the API key into the Geocode API dialog, and click "Save". You can test the API Key by clicking the Test button at lower left.



The screenshot shows the 'Geocode API Key' dialog box. At the top, it says 'IPAM Regions requires a Geocode API Key in order for IPAM Maps to properly determine a Region's location.' Below this, the 'Geolocalization Service Provider' section has two radio buttons: 'Google' (selected and circled in red) and 'Radar'. A text instruction follows: 'To obtain a Google Geocode API Key, follow the instructions at [Google's Geocoding API - 'Get API Key' page](#).' Below this is a text input field labeled 'Google Geocode API Key' with the placeholder text 'Enter Api Key...'. A red arrow points to this field. At the bottom, there are three buttons: 'Test API Key' (green, circled in red), 'Save' (blue, circled in red), and 'Close' (grey).

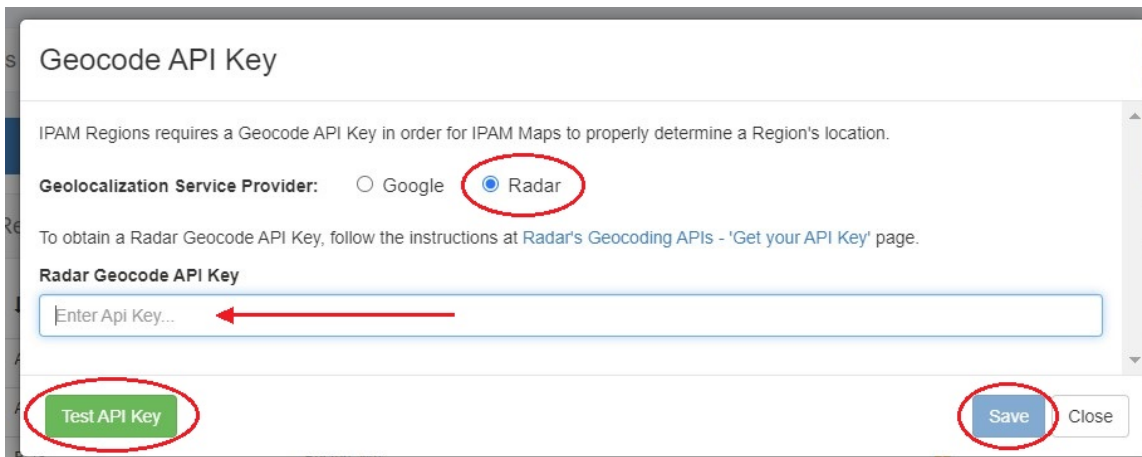
#### Step 1: Obtain a Radar Geocoding API Key

To get a Radar Geocoding API Key, follow the instructions listed [here](#):

### How to get a Radar Geocoding API Key

#### Step 2: Assign the API Key to IPAM Regions

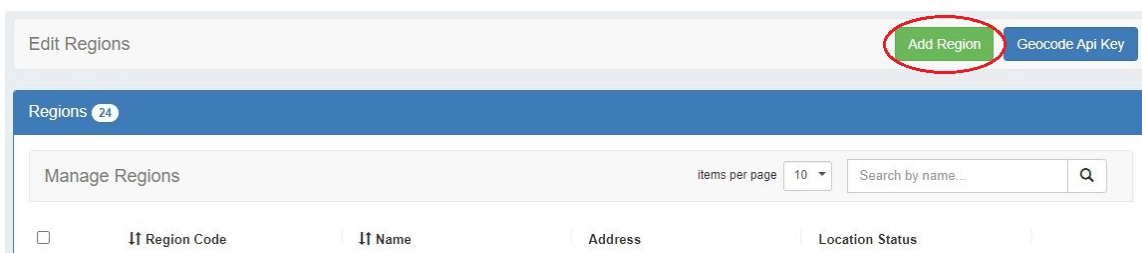
Once assigned a Radar Geocoding API Key, from the Edit Regions page, click "Geocode API Key". Then select the Radar radio button, paste the API key into the Geocode API dialog, and click "Save". You can test the API Key by clicking the Test button at lower left.



The screenshot shows the 'Geocode API Key' dialog box. At the top, it says 'IPAM Regions requires a Geocode API Key in order for IPAM Maps to properly determine a Region's location.' Below this, the 'Geolocalization Service Provider' section has two radio buttons: 'Google' and 'Radar' (selected and circled in red). A text instruction follows: 'To obtain a Radar Geocode API Key, follow the instructions at [Radar's Geocoding APIs - 'Get your API Key' page](#).' Below this is a text input field labeled 'Radar Geocode API Key' with the placeholder text 'Enter Api Key...'. A red arrow points to this field. At the bottom, there are three buttons: 'Test API Key' (green, circled in red), 'Save' (blue, circled in red), and 'Close' (grey).

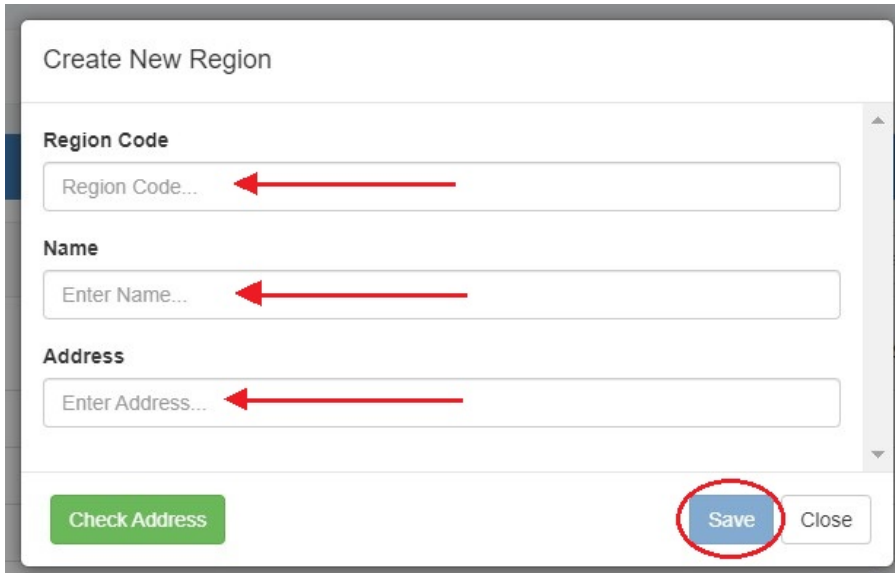
## Managing Regions

To **add** a new Region item, click the "Add Region" button at the top of the screen.



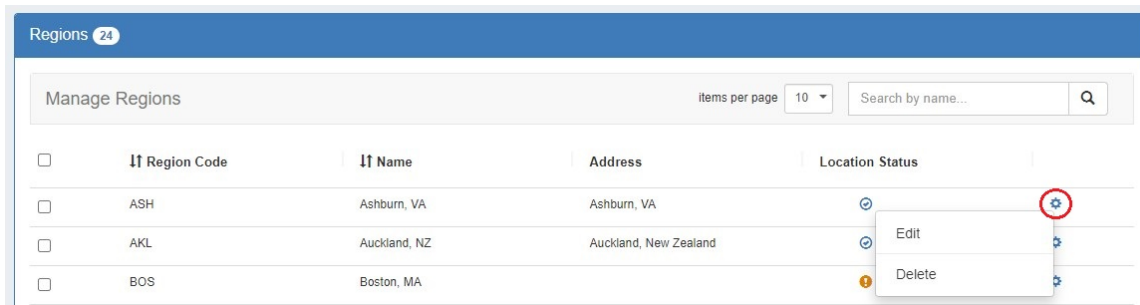
The screenshot shows the 'Edit Regions' page. At the top right, there are two buttons: 'Add Region' (green, circled in red) and 'Geocode Api Key' (blue). Below these is a blue header bar with the text 'Regions 24'. Underneath is a 'Manage Regions' section with a table. The table has columns: 'Region Code', 'Name', 'Address', and 'Location Status'. There are also controls for 'items per page' (set to 10) and a 'Search by name...' input field with a search icon.

In the form that appears, type in a new Region Code, Name, and Address into the empty fields and click "Save".



The "Create New Region" form contains three input fields: "Region Code" with placeholder "Region Code...", "Name" with placeholder "Enter Name...", and "Address" with placeholder "Enter Address...". Each field has a red arrow pointing to it. At the bottom, there is a green "Check Address" button, a blue "Save" button (circled in red), and a grey "Close" button.

The new Region will be added to the Region list.



The "Regions" table has columns: Region Code, Name, Address, and Location Status. It lists three regions: ASH (Ashburn, VA), AKL (Auckland, NZ), and BOS (Boston, MA). A red circle highlights the gear icon in the Location Status column for the ASH row, which has opened a context menu with "Edit" and "Delete" options.

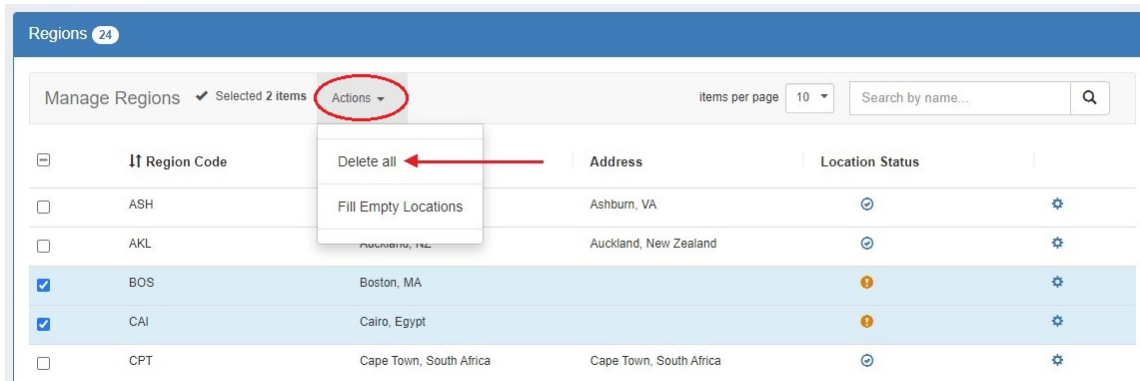
|                          | Region Code | Name         | Address               | Location Status |
|--------------------------|-------------|--------------|-----------------------|-----------------|
| <input type="checkbox"/> | ASH         | Ashburn, VA  | Ashburn, VA           |                 |
| <input type="checkbox"/> | AKL         | Auckland, NZ | Auckland, New Zealand |                 |
| <input type="checkbox"/> | BOS         | Boston, MA   |                       |                 |

To **sort** the regions list, click on a column header to sort by Region Code or Name.

To **edit** a region, right click on the row and select "Edit" from the Action Menu. This will bring up the edit modal. Input your desired changes, then click "Save".

To **delete** a single region, select "Delete" from the the Action Menu (gear icon).

To **delete multiple** regions, select the regions to delete by clicking the checkboxes at left. Then, click on the "Actions" menu at the top of the list and select "Delete All".



The "Regions" table shows two regions selected (BOS and CAI). The "Actions" menu at the top is open, showing "Delete all" and "Fill Empty Locations" options. A red arrow points to "Delete all".

|                                     | Region Code | Name                    | Address                 | Location Status |
|-------------------------------------|-------------|-------------------------|-------------------------|-----------------|
| <input type="checkbox"/>            | ASH         | Ashburn, VA             | Ashburn, VA             |                 |
| <input type="checkbox"/>            | AKL         | Auckland, NZ            | Auckland, New Zealand   |                 |
| <input checked="" type="checkbox"/> | BOS         | Boston, MA              |                         |                 |
| <input checked="" type="checkbox"/> | CAI         | Cairo, Egypt            |                         |                 |
| <input type="checkbox"/>            | CPT         | Cape Town, South Africa | Cape Town, South Africa |                 |

You may also right click on the selected items to open a context menu to either "Unselected all" or "Delete all".

Regions 24

Manage Regions ✓ Selected 2 items Actions Items per page 10 Search by name...

|                                     | Region Code | Name                    | Address                 | Location Status |    |
|-------------------------------------|-------------|-------------------------|-------------------------|-----------------|----|
| <input type="checkbox"/>            | ASH         | Ashburn, VA             | Ashburn, VA             | ✓               | ⚙️ |
| <input type="checkbox"/>            | AKL         | Auckland, NZ            | Auckland, New Zealand   | ✓               | ⚙️ |
| <input checked="" type="checkbox"/> | BOS         | Boston, MA              |                         | ⚠️              | ⚙️ |
| <input checked="" type="checkbox"/> | CAI         | Cairo, Egypt            |                         | ⚠️              | ⚙️ |
| <input type="checkbox"/>            | CPT         | Cape Town, South Africa | Cape Town, South Africa | ✓               | ⚙️ |

Unselect all  
Delete all

## Valid / Invalid Regions

Valid addresses will show a check mark in the "Location Status" field, invalid/empty addresses (unable to be mapped) will show a yellow exclamation point. When adding or editing a region, click the "Check Address" button at the lower left of the modal to check the validity of an address.

Update Region

**Region Code**

DAL

**Name**

Dallas, TX

**Address**

Dallas, TX

**Location:** Dallas, TX, USA

Check Address Save Close

## Fill Empty Region Locations

To quickly fill empty addresses for multiple regions, select "Fill Empty Locations" from the "Actions" menu at the top of the Regions list. This will fill the addresses based on their supplied "Name" value.

Regions 24

Manage Regions ✓ Selected 2 items Actions Items per page 10 Search by name...

|                                     | Region Code | Name                    | Address                 | Location Status |    |
|-------------------------------------|-------------|-------------------------|-------------------------|-----------------|----|
| <input type="checkbox"/>            | ASH         | Ashburn, VA             | Ashburn, VA             | ✓               | ⚙️ |
| <input type="checkbox"/>            | AKL         | Auckland, NZ            | Auckland, New Zealand   | ✓               | ⚙️ |
| <input checked="" type="checkbox"/> | BOS         | Boston, MA              |                         | ⚠️              | ⚙️ |
| <input checked="" type="checkbox"/> | CAI         | Cairo, Egypt            |                         | ⚠️              | ⚙️ |
| <input type="checkbox"/>            | CPT         | Cape Town, South Africa | Cape Town, South Africa | ✓               | ⚙️ |

Delete all  
Fill Empty Locations

Please confirm

Are you sure you want to fill empty/invalid locations for **2 Regions**?  
This process attempts to fill empty locations based on the supplied name value.

Fill Locations

Close

## Region Resource Generation

Optionally, users may generate a resource entry for a region, in order to associate items such as contacts, notes, linked resources, or fields with that region.

Clicking on a region link from IPAM Manage will automatically generate a resource entry for that region, under the "SystemRegion" section.

| Manage aggregate    |         |               |              |                       |               |                |           |                                 |              |          |        |             |
|---------------------|---------|---------------|--------------|-----------------------|---------------|----------------|-----------|---------------------------------|--------------|----------|--------|-------------|
| 4.4.0.0/16 - LACNIC |         |               |              | Switch to Parent view | Netblock Tree | export to CSV  | actions + | Search within this aggregate... |              |          |        |             |
| IP Address          | IP Mask | IP Location   | IP Block ... | IP Tags               | IP ASN        | IP Assigned to | IP VLA... | IP Updated                      | IP LIR Test  | IP Notes | IP NAT | IP Metad... |
| 4.4.0.0/32          | 32      | St. Louis, MO | abc          |                       | -             | holding        | -         | 2022-09-12 17:...               | -            | -        | -      | -           |
| 4.4.0.1/32          | 32      | St. Louis, MO | -            |                       | -             | Analogic Co... | -         | 2022-09-12 16:...               | -            | -        | -      | -           |
| 4.4.0.2/31          | 31      | St. Louis, MO | abc          |                       | -             | holding        | -         | 2022-09-13 15:...               | LACNIC Te... | -        | -      | -           |
| 4.4.0.4/30          | 30      | St. Louis, MO | -            |                       | 88588         | 1 Beacon St... | -         | 2022-08-30 19:...               | -            | -        | -      | -           |

The (non-editable) SystemRegion section includes the following Gadgets: Resource View, IPAMv2, Contacts, Resource Linkage, Notes, Document Storage, and Fields.

Resources

Open Chart View

Export as CSV

Resources / Entries / St. Louis, MO

Resource View

Name:

St. Louis, MO

ID:

54974

Section:

SystemRegion

Category:

Uncategorized

edit

Users may then use those Gadgets on the region resource to associate contacts, notes, custom fields, or other information to that region.

## Add / Edit IPv4 / IPv6 Subnet Dropdowns

When assigning blocks using the "Smart Assign" function in the [IPAM Gadget](#), the user has an option to assign an IP resource by allocation size. Assignments down to a single host level (/32 for IPv4, /128 for IPv6) are supported.

### Note on Editing the Subnet Dropdown

Keep in mind that this is a global edit. If the values in the dropdown are changed, it will affect ALL users.

To add a new Subnet item, click on "Add Item" at the top of the Edit List: IPv4 or IPv6 Subnets page.

Edit IPv4 Subnets

Sort Numerically

Add Item

Subnets List 13

Drag to change order, add, update or remove subnet value for IPv4 up to 32. Save changes to preserve order and modifications.

| Value          | Display | Options |
|----------------|---------|---------|
| <div></div> 20 | /20     | Delete  |
| <div></div> 21 | /21     | Delete  |
| <div></div> 22 | /22     | Delete  |
| <div></div> 23 | /23     | Delete  |
| <div></div> 24 | /24     | Delete  |
| <div></div> 25 | /25     | Delete  |
| <div></div> 26 | /26     | Delete  |
| <div></div> 27 | /27     | Delete  |
| <div></div> 28 | /28     | Delete  |
| <div></div> 29 | /29     | Delete  |
| <div></div> 30 | /30     | Delete  |
| <div></div> 31 | /31     | Delete  |
| <div></div> 32 | /32     | Delete  |

Back to IPAM Admin

Save Changes

Then, type in the desired Value and Display value for the Subnet, and hit "Create".

Create Subnet

Value

19

Display

/19

Create

Close

After adding a new item, it will show at the bottom of the list. Hit "Save Changes" to save your changes.

30

/30

Delete

31

/31

Delete

32

/32

Delete

Back to IPAM Admin

Save Changes

To **edit** a subnet, simply type your changes in to the text box. Remember to click "Save Changes" before exiting.

To **reorder** the subnet list, click and hold on the "list" icon (three lines) to the left of the subnet, then drag to the desired location in the list and release.

After adding or editing a subnet, you may wish to clean up the list order by hitting "Sort Numerically" at the top of the page to reset the list order, including the new entry.

To **delete** a subnet, click on the red "Delete" button to the right of the subnet entry.

When complete, be sure to click on the "Save" button to save your changes.

## Edit IPAM Rules

IPAM Rules allow for certain address positions within an IP Block to be reserved when utilizing Direct Assign and Smart Assign. These rulesets may be managed in the "Edit IPAM Rules" section of IPAM Admin.

| IPAM rules                                                                                                                                                                                                                                                                                                                                                                                                                                     |                          |           |                                               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|-----------|-----------------------------------------------|
| IPAM Rules allow users to exclude IP addresses from being assigned by Smart Assign or Direct Assign, based on the IP address position in the block. Admin users may view all existing IP Rules, the blocks affected by each rule, create new rules, and delete rules from this page. Changing the positions in a ruleset applies that change to all blocks using that rule - ensure that changes are desired universally when updating a rule. |                          |           |                                               |
| <div>Search for a rule</div>                                                                                                                                                                                                                                                                                                                                                                                                                   |                          |           |                                               |
| Rule name                                                                                                                                                                                                                                                                                                                                                                                                                                      | Creation date            | Positions | Actions                                       |
| Reserve 1st                                                                                                                                                                                                                                                                                                                                                                                                                                    | 2021-08-02T16:51:30+0000 | 1         | <div>View Affected IP BlocksDelete rule</div> |
| Reserve 3rd                                                                                                                                                                                                                                                                                                                                                                                                                                    | 2021-08-03T17:55:45+0000 | 1         | <div>View Affected IP BlocksDelete rule</div> |
| Reserve first 3                                                                                                                                                                                                                                                                                                                                                                                                                                | 2021-08-10T16:31:00+0000 | 3         | <div>View Affected IP BlocksDelete rule</div> |

For additional details, see [IPAM Rules](#).

## Numbering Authority

Numbering Authority allows Admin users to configure domain sets of values, for use with associated functions or external number tracking.

| Numbering Authority                                                                                                                                        |                |                                                                    |                                                     |
|------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|--------------------------------------------------------------------|-----------------------------------------------------|
| <div>Create New</div>                                                                                                                                      |                |                                                                    |                                                     |
| Configure Authority                                                                                                                                        |                |                                                                    |                                                     |
| Numbering Authority is a configurable set of values and the associated functions to track which values have been handed out and which are still available. |                |                                                                    |                                                     |
| <div>Filter by Type: none<div>Search...Q</div></div>                                                                                                       |                |                                                                    |                                                     |
| ↑ Name                                                                                                                                                     | ↑ Reuse values | ↑ Type                                                             | Actions                                             |
| Cisco Router VLAN Numbering Domain Template                                                                                                                | Yes            | Multi-range<br>Ranges: 1-1001<br>Excluded Ranges: 1002-1005        | <div>Get Next ValueView Assigned ValuesDelete</div> |
| Cisco Router VLAN Extended Numbering Domain Template                                                                                                       | Yes            | Multi-range<br>Ranges: 1-4094<br>Excluded Ranges: 1,3968-4047,4094 | <div>Get Next ValueView Assigned ValuesDelete</div> |

With Numbering Authority, you can create new numbering domains, track which values have been handed out, free values no longer in use, generate the next sequence value, and associate keys-value pairs to a number value. Numbering Domains may be used with APIv2 to generate numbers for use within ProVision instances or custom applications.

## Available Domain Types

Six numbering domain types are available in Numbering Authority: Sequential, Multi-Range, Meta Multi-range, UIUDv4, IPv6 Sparse Allocation, and Meta IPv6.

### **Sequential:**

Provides a sequential number domain starting with '0' and progressing in numerical order. Potential Applications: Ticketing Queues, Customer Numbers

### **Multi-Range:**

User-defined numbers and number ranges (e.g.: 2-3,4-6, 25, 27-28) to include or exclude as available. Potential Applications: VLANs

### **Meta Multi-Range:**

The Meta Multi-range numbering type is similar to Multi-range, but includes additional options to specify the ordering sequence.

Users define individual numbers and number ranges (e.g.: 2-3,4-6, 25, 27-28) to include or exclude as available, and then may also specify a Selection name and algorithm to specify the order.

### **UIUD v4:**

Generates a Universally Unique Identifier according to v4 (Random) standard. Potential Applications: Unique Identifiers

### **IPv6 Sparse Allocate:**

Determines the next IPv6 block to assign to evenly distribute assignments throughout the provided range. Used with the IPAM IPv6 Aggregate Sparse Allocate function. See: [Working with IP Aggregates](#) . Applications: IPv6 Sparse Allocation

### **Meta IPv6:**

The Meta IPv6 numbering type generates the next IPv6 block of the specified mask from a larger aggregate. Users may specify a Selection name and algorithm to specify the order (forwards/backwards).

Optionally, new sub numbering domains may be created automatically at each number generation in order to generate assignment blocks for hierarchical IPv6 relationships.

## Working with Numbering Domains

See below for additional information on creating Numbering Domains and using domain actions.

### Create a Numbering Domain

Go to Admin IPAM Admin, and select the "Numbering Authority" page.

Create a new numbering domain by expanding the "Create New Numbering Domain" section, then typing in a name for the new domain and selecting a domain type.

Create New Numbering Domain

Name:

Custom Range Domain

Type:

Multi-range

Ranges:

1-100

e.g.: 15, 20-29, 32, 1-10

Exclude ranges:

2-10

e.g.: 2-3,4-6, 25, 27-28

☒ Reuse values

Create

Enter information for the specific domain type, if necessary, and select whether to allow number reuse. When done, click "Create".

All Numbering Domains must have, at minimum "Name" provided and a "Type" selected.

Additional options may exist based on the selected Numbering Domain type:

### Multi-Range:

- **Ranges:** Enter the numbers / number ranges to include
- **Exclude Ranges (optional):** Enter any numbers / number ranges to exclude

### Meta Multi-range:

- **Domain**
  - **Ranges:** Enter the numbers / number ranges to include
  - **Exclude Ranges (optional):** Enter any numbers / number ranges to exclude
- **Selection Types:**
  - **Selection Name:** Enter a nickname for each desired selection order to add
  - **Selection algorithm:** Choose the number ordering method to use for each selection type added. Options are: Forwards, Backwards, Even first, or Odds First.

### Meta IPv6:

- **Domain**
  - **IP Block:** Enter the parent IP Block from which to generate the IPv6 addresses
  - **IP Mask:** Enter the mask of the parent IP Block
- **Selection Types:**
  - **Selection Name:** Enter a nickname for each desired selection type to add
  - **Mask:** Enter the desired mask of the child blocks to generate
  - **Selection algorithm:** Choose the number ordering method to use for each selection type added. Options are: Forwards, Backwards.
  - **Create Numbering Domain:** If other Meta IPv6 Numbering Authority Domains exist, you may opt to create a new numbering domain from an existing domain each time a number is generated. The automatically generated sub-domain may then have numbers generated independently. This may be useful in cases of complicated hierarchical IPv6 relationships, or which multiple levels of exclusions exists.

### IPv6 Sparse Allocate:

- **Starting IPv6:** The starting IPv6 block, e.g ABCD:EF01:2345::
- **Starting Block Prefix:** Prefix for the starting IPv6 block, e.g 48
- **Increments:** the size / increment to use when sparse allocating, e.g. 64
- **Allocation Type:** the allocation direction to use - Leftmost, Center, or Rightmost

## Number Domain Actions

Numbering Authority

Create New >

Configure Authority

Numbering Authority is a configurable set of values and the associated functions to track which values have been handed out and which are still available.

Filter by Type: none Search...

| ↕ Name                                               | ↕ Reuse values | ↕ Type                                                                 | Actions                                          |
|------------------------------------------------------|----------------|------------------------------------------------------------------------|--------------------------------------------------|
| Cisco Router VLAN Numbering Domain Template          | Yes            | Multi-range<br><br>Ranges: 1-1001<br>Excluded Ranges: 1002-1005        | Get Next Value<br>View Assigned Values<br>Delete |
| Cisco Router VLAN Extended Numbering Domain Template | Yes            | Multi-range<br><br>Ranges: 1-4094<br>Excluded Ranges: 1,3968-4047,4094 | Get Next Value<br>View Assigned Values<br>Delete |

Once a numbering domain is created, you may perform the following actions:

### Get Next Value:

Gets the next value in the domain, adds it to the list of used domain values (assigns to the domain), and displays that value to the user.

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### Numbering Domain Values: UIUD

Next generated value: **202631f9-a307-49fb-9f41-d7a190846135**

Close

### Get Next Value with Selection Types:

If the numbering domain has associated Selections, such as the Meta Multi-range Example below, then the Selection type (pick order) will need to be set prior to generating the next number.

Configure Authority

Numbering Authority is a configurable set of values and the associated functions to track which values have been handed out and which are still available.

Filter by Type: Meta Multi-range Search...

| ↕ Name                   | ↕ Reuse values | ↕ Type                                                                                                                                                                                                      | Actions                                          |
|--------------------------|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|
| Meta Multi Range Example | Yes            | Meta Multi-range<br><br>Ranges: 1-10, 15-25<br>Excluded Ranges: 5, 17-20<br>Selections<br>Example Forwards: forwards<br>Example Backwards: backwards<br>Example Even: even-first<br>Example Odd: odds-first | Get Next Value<br>View Assigned Values<br>Delete |

1

Displaying 1 to 10 of 1 items

[Back To IPAM Admin](#)

- To get the next value, Click "Get Next Value" under "Actions", then choose the selection name to use for the number generation.

**Get next value for Meta Multi Range Example**

Please enter selection

Example Forwards

Confirm Close

Click "Confirm". The next number, according to the chosen selection order, will be displayed.

**Numbering Domain Values: Meta Multi Range Example**

Next generated value: **1**

Close

### Get Next Value with Selection Types:

If "Create numbering domain" was set to create a new domain from an existing Meta IPv6 setup, then each time a number is generated a new Meta-IPv6 sub-domain item will be created using the settings from the referenced domain.

- Here, we've created a new Meta IPv6 Numbering Authority "Meta IPv6 Example with Domain", where the selection creates a new domain based off "Meta IPv6 Example".

**Create New**

Name: Meta IPv6 Example with Domain

Type: Meta IPv6

**Domain**

IP Block: ABCD:aaaa:2345::  
e.g.: ABCD:EF01:2345::

IP Mask: /32  
e.g.: /48

**Selection types**

| Selection name:        | Mask:           | Selection algorithm: | Create numbering domain: |
|------------------------|-----------------|----------------------|--------------------------|
| Example with Domain Fr | /64<br>e.g. /64 | Forwards             | Meta IPv6 Example        |

+ Add more

☒ Reuse values

Create

Once created, the new Meta IPv6 domain will be added to the Numbering Authority list. When you are ready, click "Get Next Value" for the domain we just created.

Note: Above our newly created domain, you can see the domain "Meta IPv6 Example", that we referenced under the "Create numbering domain" setting.

| ↑ Name                        | ↑ Reuse values | ↑ Type                                                                                                                                                 | Actions                                                                                          |
|-------------------------------|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|
| Meta IPv6 Example             | Yes            | Meta IPv6<br><br>IP Block: ABCD:EF01:2345::<br>IP Mask: /32<br>Selections<br>/64 Forward: forwards (Mask: /64)<br>/64 Backwards: backwards (Mask: /64) | <a href="#">Get Next Value</a><br><a href="#">View Assigned Values</a><br><a href="#">Delete</a> |
| Meta IPv6 Example with Domain | Yes            | Meta IPv6<br><br>IP Block: ABCD:aaaa:2345::<br>IP Mask: /32<br>Selections<br>Example w Domain Forwards: forwards (Mask: /64)                           | <a href="#">Get Next Value</a><br><a href="#">View Assigned Values</a><br><a href="#">Delete</a> |

Pick the ordering selection to use with the Meta IPv6 domain to generate the next number, then click "Confirm".

API Scheduler Scanning Log Approvals Constraints Exit Admin

### Get next value for Meta IPv6 Example with Domain

Please enter selection

Example w Domain Forwards

[Confirm](#)[Close](#)

Once confirmed, the next IPv6 value will be provided.

API Scheduler Scanning Log Approvals Constraints Exit Admin

### Numbering Domain Values: Meta IPv6 Example with Domain

Next generated value: **abcd:ef01:2345::**

[Close](#)

After closing out of the value result, you will see that an entirely new numbering domain was created - ("Meta IPv6) Automatic domain for abcd:ef01:2345:1::/64" using the settings referenced from "Meta IPv6" example (Note: the browser page may need to be refreshed in order to see the update).

| ↑ Name                                                 | ↑ Reuse values | ↑ Type                                                                                                                                                 | Actions                                                                                          |
|--------------------------------------------------------|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|
| Meta IPv6 Example                                      | Yes            | Meta IPv6<br><br>IP Block: ABCD:EF01:2345::<br>IP Mask: /32<br>Selections<br>/64 Forward: forwards (Mask: /64)<br>/64 Backwards: backwards (Mask: /64) | <a href="#">Get Next Value</a><br><a href="#">View Assigned Values</a><br><a href="#">Delete</a> |
| Meta IPv6 Example with Domain                          | Yes            | Meta IPv6<br><br>IP Block: ABCD:aaaa:2345::<br>IP Mask: /32<br>Selections<br>Example w Domain Forwards: forwards (Mask: /64)                           | <a href="#">Get Next Value</a><br><a href="#">View Assigned Values</a><br><a href="#">Delete</a> |
| (Meta IPv6) Automatic domain for abcd:ef01:2345:1::/64 | Yes            | Meta IPv6<br><br>IP Block: abcd:ef01:2345::<br>IP Mask: /64<br>Selections<br>/64 Forward: forwards (Mask: /64)<br>/64 Backwards: backwards (Mask: /64) | <a href="#">Get Next Value</a><br><a href="#">View Assigned Values</a><br><a href="#">Delete</a> |

Once an Automatic domain has been created, it can have values generated and be managed independently from the original parent domain.

This allows for more complicated hierarchy assignment systems to have numbers generated at each tier separately, using different masks and/or selection ordering.

## View Assigned Values:

View values that are assigned to the domain, view used/free status, free assigned blocks, and save key-value metadata to values.

Numbering Authority

**(3) Numbering Domain Values For: Custom Range Domain**

| ↕ Value | ↕ Free | Metadata |           |      | Actions |
|---------|--------|----------|-----------|------|---------|
| 1       | No     | New key  | New value | Save | Free    |
| 11      | No     | New key  | New value | Save | Free    |
| 12      | No     | New key  | New value | Save | Free    |

Close

Increment: 64

Sort by Value and Free/Used values by clicking the column names

To add metadata to a value, enter your information into the "Key" and "Value" fields under Metadata, then click "Save".

Free a value for reuse, if allowed, by clicking "Free" under the value Actions column.

## Delete:

Deletes the numbering domain.

## Edit IPAM or VLAN Columns

The Edit IPAM Columns and Edit VLAN Columns pages lets you change the order, column name, and visibility of IPAM / VLAN columns globally for IPAM / VLAN areas, respectively.

Editing IPAM Columns will affect the order, name, and visibility of columns in IPAM Manage and the IPAM Gadget, and the available fields in Edit Block for both VLAN and IPAM.

Editing VLAN columns will affect the order, name, and visibility of columns in VLAN Manage, VLAN Advanced, and the available fields in Edit Domain / Edit VLAN.

Additionally, for both IPAM and VLAN, any disabled fields will not be filterable or accessible in IPAM / VLAN Reports.

Eleven default fields and ten user-defined "Metadata" fields are available for customization.

Edit IPAM Columns 24

Manage column settings globally for all users. Edit column names, toggle visibility, reorder columns by dragging the a row and dropping in the desired order. Optionally, you can define **constraints** associated to each column that allows IPAM data to be entered only if it meets the predefined conditions. Some columns do not allow constraints.

| Field Name         | Column Name | Options |
|--------------------|-------------|---------|
| CIDR               | Address     | 👁       |
| MASK               | Mask        | 👁       |
| RESOURCEHOLDERNAME | Assigned to | 👁       |
| TAGS               | Tags        | 👁       |

Keep in mind that "Edit Columns" is a global edit. If the values for order, header, or visibility are changed, it will affect ALL users!

To **edit** a column name, simply type your changes into the text box. and click the "Save Changes" button.

|        |             |  |  |
|--------|-------------|--|--|
| META6  | Metadata654 |  |  |
| META7  | Metadata7   |  |  |
| META8  | Metadata8   |  |  |
| META9  | Metadata9   |  |  |
| META10 | Metadata10  |  |  |

Back to IPAM Admin **Save Changes**

To **reorder** the columns, click and hold on the "list" icon (three lines) to the left of the subnet, then drag to the desired location in the list and release.

|        |            |  |  |
|--------|------------|--|--|
| META8  | Metadata8  |  |  |
| META10 | Metadata10 |  |  |
| META9  | Metadata9  |  |  |

Back to IPAM Admin **Save Changes**

To **toggle visibility** for a column, click the eye icon to the right of the column name to enable / disable visibility.

This shows or hides the column in both IPAM Manage and the IPAM Gadget, and affects all users.

|        |            |  |  |
|--------|------------|--|--|
| META9  | Metadata9  |  |  |
| META10 | Metadata10 |  |  |

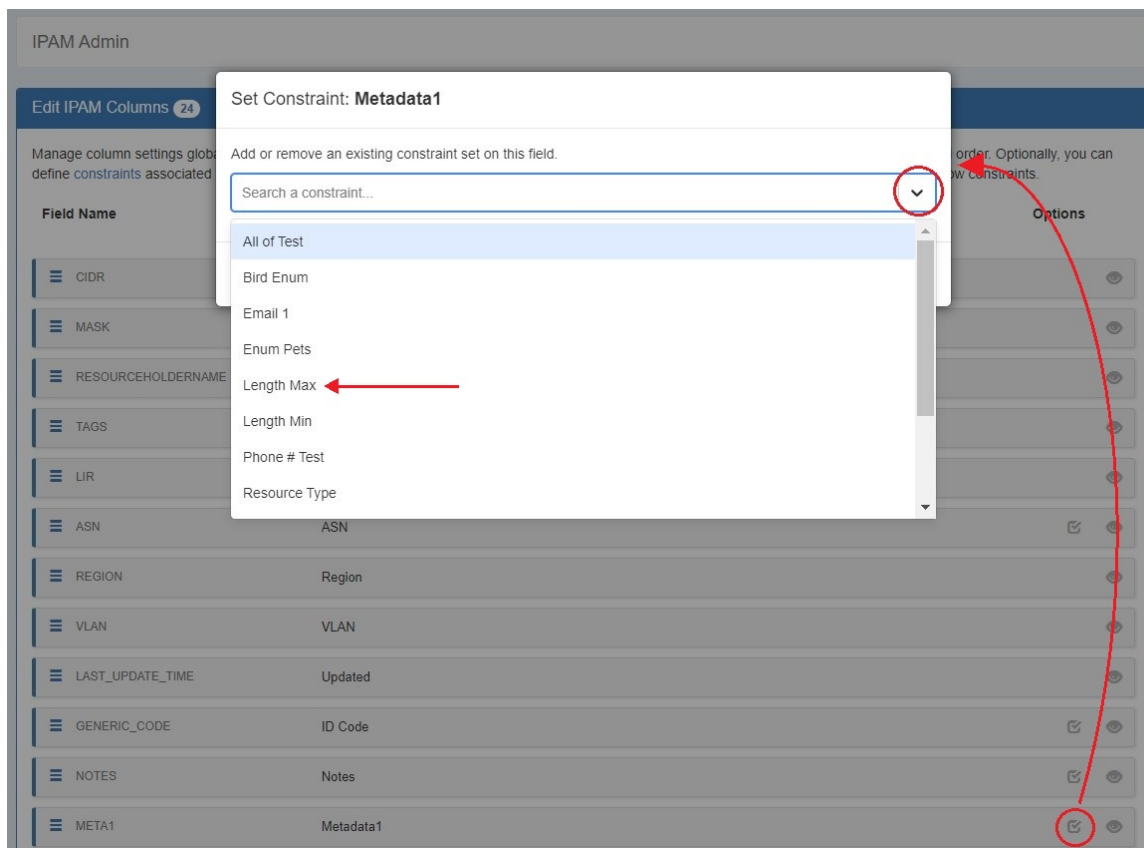
Back to IPAM Admin **Save Changes**

When complete, be sure to click on the "Save Changes" button to save your changes.

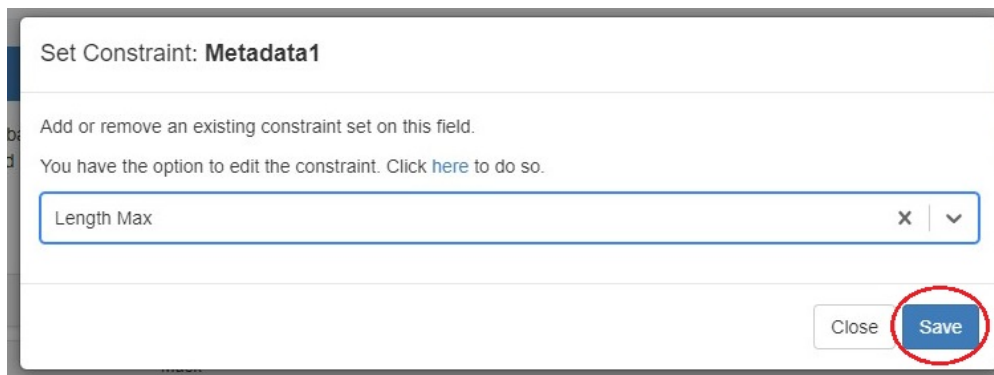
## Adding Constraints to IPAM Columns

The Constraints system allows for custom field validation and field restrictions to be created for IPAM fields. The applied constraint may be anything from a numerical comparison operation, a check against a pre-determined text string, ensuring selections from a pre-set list, or forcing entries into a specific format, such as IPv4/IPv6, phone number, or RegEx. For more detail on available types of constraints and creating them see the Constraints section.

A column that may have a constraint applied will have a checkmark icon in the "Options" column. Click the icon and select a constraint from the dropdown.



Click "Save".



The applied constraint name will then be displayed in the column row.

|        |            |            |  |
|--------|------------|------------|--|
| NOTES  | Notes      |            |  |
| META1  | Metadata1  | Length Max |  |
| META2  | Metadata2  |            |  |
| META3  | Metadata3  |            |  |
| META4  | Metadata4  | Bird Enum  |  |
| META5  | Metadata5  | Length Max |  |
| NAT    | NAT        |            |  |
| META6  | Metadata6  |            |  |
| META7  | Metadata7  |            |  |
| META8  | Metadata8  |            |  |
| META9  | Metadata9  |            |  |
| META10 | Metadata10 |            |  |

Back to IPAM Admin **Save Changes**

Click "Save Changes" before exiting the IPAM Column page to retain changes.

## Additional Information

Continue on to the following pages for additional information on IPAM Admin tasks:

- [IPAM Rules](#)
- [Holding Tank Management](#)
- [LIR Management and Use](#)
- [Constraints](#)

For additional information on non-admin IPAM areas, see:

- [IPAM Tab](#)