



# Expedition

## TechNote: CSV Import Guide

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For Version: 1.1.x and earlier



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# TechNote Summary

This tech note will describe how to use the option to import configurations formatted in CSV format.

## Use Cases

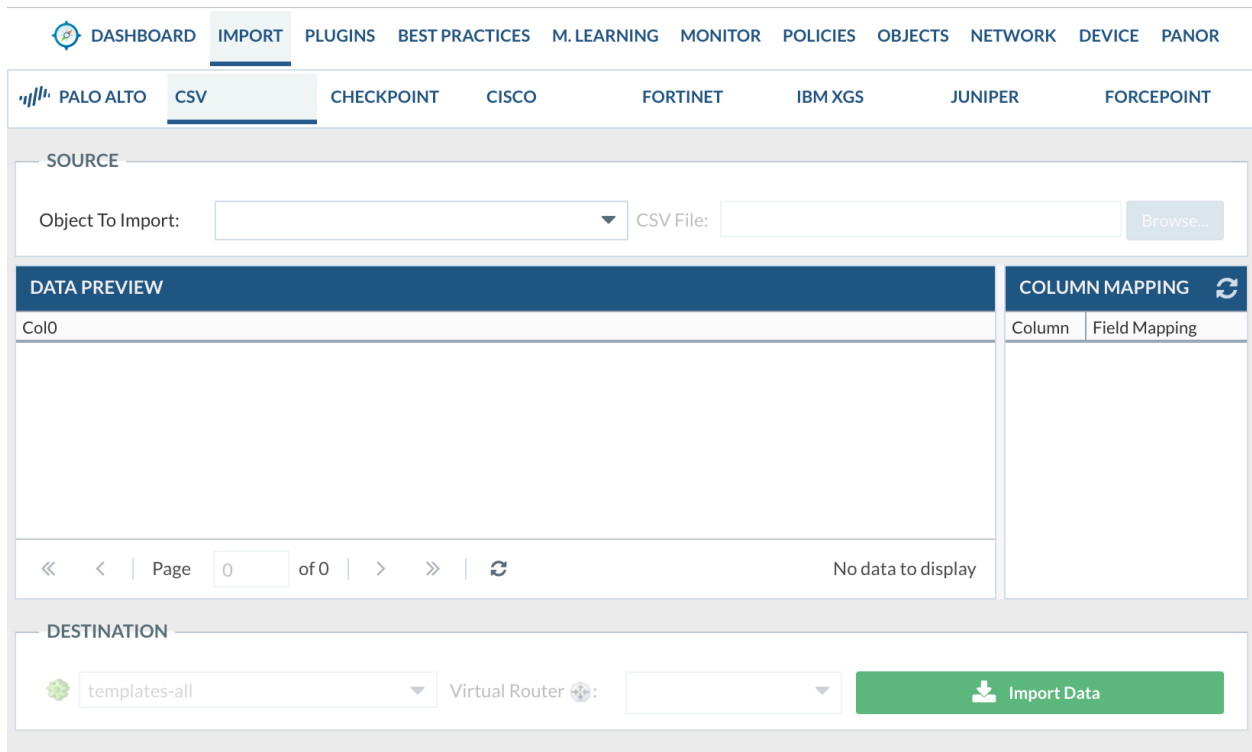
There are many use cases to utilize the CSV import feature with one of the main use cases being used to migrate 3<sup>rd</sup> party firewall configurations that Expedition currently does not have a native configuration parser for.

The process to parse a configuration file (from a 3<sup>rd</sup> party firewall) and save the output in the Expedition supported CSV format is up to the user to build a process for. Writing a script to parse a configuration file is one method but the writing of the actual script is left to the end user.

This document is meant to provide guidance on the needed format of the CSV files for import into Expedition and how to use the configurations into a PanOS XML file that can be merged into Panorama or a firewall configuration file.

The option to import CSV files is found under the menu, from within a project:

IMPORT → CSV



The screenshot shows the Expedition web interface for importing CSV data. The navigation bar includes: DASHBOARD, **IMPORT**, PLUGINS, BEST PRACTICES, M. LEARNING, MONITOR, POLICIES, OBJECTS, NETWORK, DEVICE, PANOR. Below the navigation bar, there are tabs for different vendors: PALO ALTO, **CSV**, CHECKPOINT, CISCO, FORTINET, IBM XGS, JUNIPER, FORCEPOINT. The main content area is divided into three sections:

- SOURCE**: Contains a dropdown for "Object To Import:" and a text input for "CSV File:" with a "Browse..." button.
- DATA PREVIEW**: A table with a header "Col0" and a refresh icon. The table is currently empty, showing "No data to display".
- COLUMN MAPPING**: A table with headers "Column" and "Field Mapping".

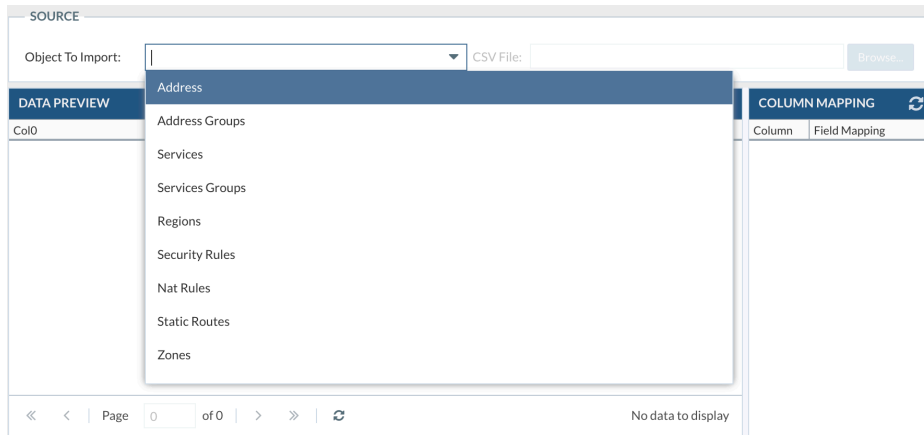
At the bottom, the **DESTINATION** section includes a dropdown for "templates-all", a dropdown for "Virtual Router", and a green "Import Data" button.

## Required Files

- **Configurations saved in the proper CSV format**

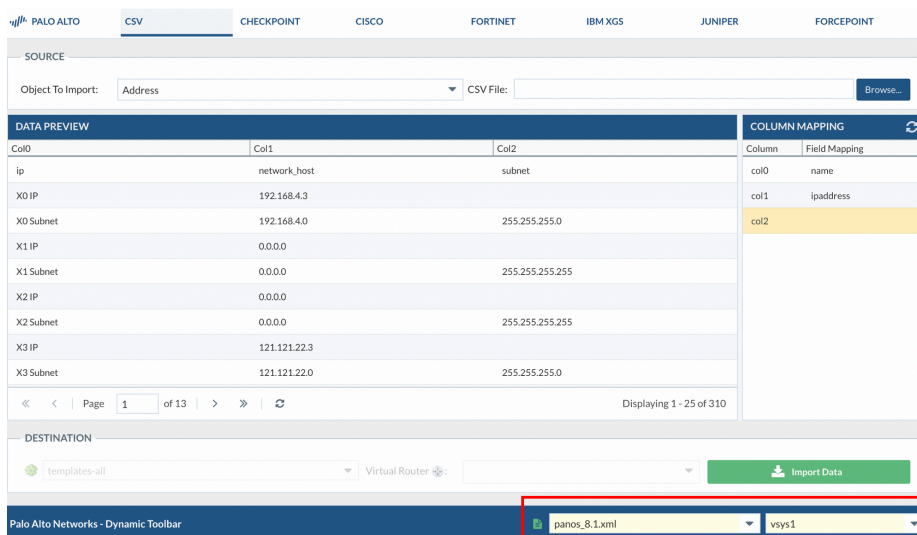
Configurations saved in CSV format. As noted earlier, the process to parse and save configurations into CSV format is up to the user to develop.

The graphic below shows the available PanOS configurations that can be imported via CSV files. Each object will be described later along with a short list of recommended minimum field mappings.



- **Base configuration imported into the project**

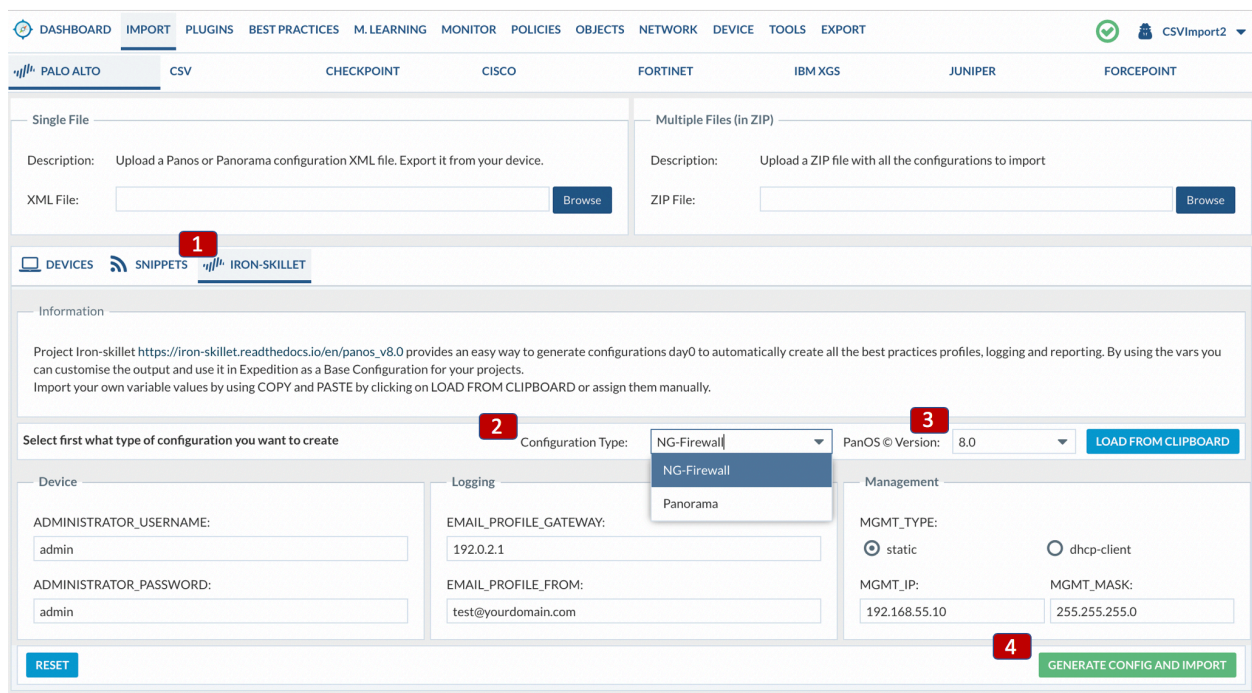
A base configuration is required to import, merge and export the imported configurations. Importing a PanOS base config should be the first task to perform after creating the project. Not having a base config in the project will prevent the importing of the configurations.



If a base config file is available, simply import that file and by default it will become the base configuration that the imported CSV configurations will be added to.

If a base config is not available, a quick option to generate a base configuration for the project is to generate an Iron Skillet. Using this option will have many benefits including having the best practices threat profiles and also log forwarding configurations that can be applied to imported security policies.

To generate an Iron Skillet base configuration, follow the steps below.



1. **Browse to: IMPORT → PALO ALTO → IRON-SKILLET**
2. **Choose the Configuration Type: NG Firewall or Panorama**
3. **Choose the PanOS version: 8.0 or 8.1 are currently supported**
4. **Generate the config and import into the project. This will provide a based config that the CSV imported configurations can be added to directly.**

## Post CSV Importing

After objects have been imported using the CSV import, they are identified by looking at the source file (src File) column. Those objects imported via a CSV imported will be shown to originate from 'csv'.

DASHBOARD IMPORT PLUGINS BEST PRACTICES M.LEARNING MONITOR POLICIES **OBJECTS** NETWORK DE

Address Services Applications Contents Users Regions Tags Other

**ADDRESS** + - ☰

<input type="checkbox"/>		Name	IP Address	Cidr	Vsys	src File
<input type="checkbox"/>	● 🖥️	121.121.3.54	121.121.3.54	0	vsys1	csv
<input type="checkbox"/>	● 🖥️	121.121.3.56	121.121.3.56	0	vsys1	csv
<input type="checkbox"/>	● 🖥️	121.121.3.64	121.121.3.64	0	vsys1	csv
<input type="checkbox"/>	● 🖥️	121.121.30.0	121.121.30.0	24	vsys1	csv
<input type="checkbox"/>	● 🖥️	121.121.4.191	121.121.4.191	0	vsys1	csv
<input type="checkbox"/>	● 🖥️	121.121.4.192	121.121.4.192	0	vsys1	csv
<input type="checkbox"/>	● 🖥️	121.121.4.54	121.121.4.54	0	vsys1	csv
<input type="checkbox"/>	● 🖥️	121.121.4.56	121.121.4.56	0	vsys1	csv

## CSV Formats

Files to be imported need to follow the format described below.

For configurations with individual members (Address, Services, Regions, Security Rules, NAT rules, Zones, Interfaces) the configurations need to be delimited with a semi-colon (;).

**Note:** the number of columns delimited by a semi-colon must match for each line. If even one line has fewer or more columns, the import of the CSV file will not be read.

For script writing guidelines, it is recommended to first build a list of columns, if a specific line does not contain a value for a column, leave that column blank but include a semi-colon for that column so each line will have the same number of columns.

See Appendix A and Appendix B for recommended CSV file formatting.

Examples:

**Security rules:**

from;to;action;source address;service;destination address;comment

CMI\_DMZ;CMI\_DMZ;allow;any;SNMP;X5:V2325;Auto-added

**Addresses:**

name;network\_host;subnet

X0 Subnet;192.168.4.0;255.255.255.0

**Services:**

name;protocol;destination-port  
HTTP Management,TCP,80-80

For configurations with multiple members (Address Groups, Services Groups) the primary objects need to be delimited with a semi-colon (;) with the individual members delimited with a comma (,).

**Address Groups**

name;members  
Firewalled;LAN\_Subnets,DMZ\_Subnets,WLAN\_Subnets,VPN\_INT\_ZONE\_Subnets,CHD Subnets,PubDMZ Subnets,ClientDMZ Subnets,CMI\_DMZ Subnets

**Services Groups**

name;members  
NT;LDAP,Kerberos,NetBios,NT Domain Login Port 1025,DCE EndPoint

Note: There should be no spaces between members in the list. If the first character after a comma is a space those members will not be included as members in the group.

## CSV Importing Workflow

This section will describe the workflow to import configurations via CSV. As stated earlier, a PanOS base configuration is needed in the project to continue with this step.

1. **Choose the 'Object to Import'**
2. **Browse to the appropriate CSV file**
3. **If the source file meets the formatting requirements, the output will be displayed in the 'DATA PREVIEW' window.**
4. **Choose the 'Field Mapping' for each column. The field mappings determine how each value in a column will be imported.**

Note: As a best practice, the order to import configuration files should consider dependencies. Individual objects such as address objects should be imported before address-groups and address and address-groups should be imported before security rules that referene those objects are imported.

If importing groups and rules into an existing configuration, any objects (address, address-groups, services, services-groups) referenced by those configurations should already be in the base configuration prior to importing.

SOURCE

Object To Import: Address CSV File:  Browse...

DATA PREVIEW			COLUMN MAPPING	
Col0	Col1	Col2	Column	Field Mapping
ip	network_host	subnet	col0	
X0 IP	192.168.4.3		col1	
X0 Subnet	192.168.4.0	255.255.255.0	col2	
X1 IP	0.0.0.0			
X1 Subnet	0.0.0.0	255.255.255.255		
X2 IP	0.0.0.0			
X2 Subnet	0.0.0.0	255.255.255.255		
X3 IP	121.121.22.3			
X3 Subnet	121.121.22.0	255.255.255.0		
X4 IP	192.168.168.1			

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The example above, the CSV file contained address objects from the address.csv file shown below.

```
name;network_host;subnet
X0 IP;192.168.4.3;
X0 Subnet;192.168.4.0;255.255.255.0
X1 IP;0.0.0.0;
X1 Subnet;0.0.0.0;"255.255.255.255""
X2 IP;0.0.0.0;
X2 Subnet;0.0.0.0;"255.255.255.255""
X3 IP;121.121.22.3;
X3 Subnet;121.121.22.0;255.255.255.0
X4 IP;192.168.168.1;
```

Note: the first line (name;network\_host;subnet) was added as a guide by the script to configure the field mappings. This first line is not needed but can be helpful for use as a guide. This line will result in an address object being imported but it can be deleted after importing.

The field mapping configurations for the imported address objects above should be:

COLUMN MAPPING	
Column	Field Mapping
col0	name
col1	ipaddress
col2	netmask



To modify the field mapping value, click on the box for each 'col' to display the available mappings.

COLUMN MAPPING	
Column	Field Mapping
col0	Name
col1	Name
col2	IP Address
	Netmask
	Address TYPE
	CIDR
	IP Address/CIDR
	IP
	Address/Netmask
	IP Range START
	IP Range END

**Note:** each object type has specific field mappings. Not all field are required. The appendix in this document will contain the available field mappings for each object and the minimum field mappings needed.

The completed configuration of the CSV import shown below can now be imported into a base config.

1. Choose the vsys
2. Choose 'Import Data'

The imported objects can now be seen as objects within the base config file. Note the 'src File' showing as 'csv'.

Note that the objects are showing as unused (marked with a red dot). After the groups and policies are imported that reference those objects they will turn green (indicating those objects are used).

Next steps, import the additional configuration files and review and optimize (merge and consolidate like objects for example) where possible.

The screenshot shows the Palo Alto Networks configuration interface. The top navigation bar includes: DASHBOARD, IMPORT, PLUGINS, BEST PRACTICES, M.LEARNING, MONITOR, POLICIES, **OBJECTS**, NETWORK, DEVICE, TOOLS, EXPORT, CSV/Imp. Below this is a secondary navigation bar with: Address, Services, Applications, Contents, Users, Regions, Tags, Other, and Filters [No Filters].

The main content area is split into two panels:

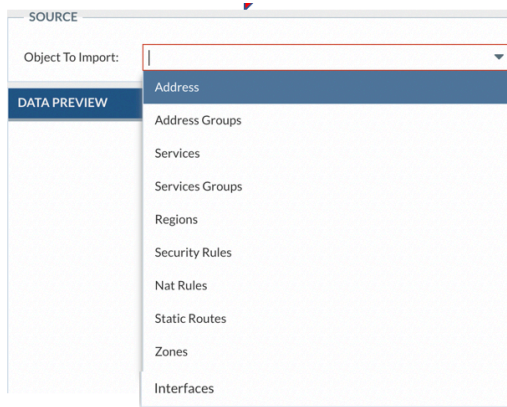
- ADDRESS:** A table with columns: Name, IP Address, Cidr, Vsys, and src File. It contains 16 rows of address objects, all marked as unused (red dot) and associated with 'vsys1' and 'csv' source files. The IP addresses and CIDR values are partially obscured by ellipses.
- ADDRESS GROUPS:** A table with columns: Name, Members, Vsys, and src File. It is currently empty, displaying "No Address Groups".

At the bottom of the interface, there is a dynamic toolbar showing: Palo Alto Networks - Dynamic Toolbar, panos\_8.1.xml, vsys1, and status indicators (green, red, and a document icon).

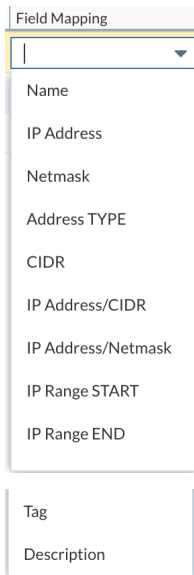
## Appendix A – Field Mappings

This section will display the field mappings for each object type to import via CSV. Minimum field mappings will also be listed where possible.

**Note:** not all field mappings need to be configured as there are field mappings specific to PanOS. If migrating objects from a 3<sup>rd</sup> party firewall configuration those configurations will likely not contain equivalent fields.



### Address




Minimum field mapping recommendations:

***Name, IP Address, Netmask or CIDR***

The above will provide enough information for IP and FQDN type address objects.

The IP Range START and IP Range END will be needed for Address objects that represent a range.

## Address Groups

COLUMN MAPPING 	
Column	Field Mapping
col0	<input type="text"/>
col1	Name
col2	Description
	Tag
	Members

Minimum field mapping recommendations:

***Name, Members***

The above will provide enough information for an address group and its members.

## Services


<input type="text"/>
Name
Description
Tag
Source Port
Destination Port
Protocol
Protocol/Port

Minimum field mapping recommendations:

***Name, Protocol, Port (this will represent the destination port)***

The above will provide enough information to create service objects.

## Services Groups


COLUMN MAPPING 	
Column	Field Mapping
col0	<input type="text"/>
col1	Name
col2	Description
	Tag
	Members

Minimum field mapping recommendations:

***Name, Members***

The above will provide enough information for a services group and its members.

## Regions


COLUMN MAPPING 	
Column	Field Mapping
col0	<input type="text"/>
col1	Name
col2	Latitude
	Longitude
	Address

Minimum field mapping recommendations:

***Name, Address***

The above will provide enough to import regions based on their Address which will be an IP subnet.

## Security Rules


COLUMN MAPPING 	
Column	Field Mapping
col0	<input type="text"/>
col1	Name
col2	From
	To
	Source
	User
	Destination
	Service
	Application
	Action
col1	Action
col2	Description
	isDisabled
	Tag
	Negate Source
	Negate Destination
	Log Start
	Log End
	Protocol
	Source Port
	Destination Port

Minimum field mapping recommendations:

***Name, From, To, Source, Destination, Service, Action, Description***

The above will provide enough information to import security policies from a 3<sup>rd</sup> party firewall.

## NAT rules


COLUMN MAPPING 	
Column	Field Mapping
col0	<input type="text"/>
col1	Name
col2	Description
	Tag
	From
	Source
	To
	Destination
	Service
	Interface
	[TP] source
	[TP] Destination
	[TP] Port
	isDisabled

Minimum field mapping recommendations:

***Name, Description, From, Source, To, Destination, [TP] Source, [TP] Destination***

The above will provide enough information to migrate NAT policies from a 3<sup>rd</sup> party firewall configuration.




## Static routes

COLUMN MAPPING 	
Column	Field Mapping
col0	<input type="text"/>
col1	Name
col2	IP Address
	Netmask
	CIDR
	IP Address/CIDR
	IP Address/Netmask
	NextHop
	Metric
	To Interface


Minimum field mapping recommendations:

***Name, IP Address, Netmask of CIDR, Next Hop***

The choosing of the virtual router to import the static route into will be prompted by the option to choose the template prior to the 'Import Data' function.

DESTINATION		
 <input type="text" value="template3"/>	Virtual Router  : <input type="text" value="default"/>	 Import Data

## Zones

COLUMN MAPPING 	
Column	Field Mapping
col0	<input type="text"/>
col1	Name
col2	Type
	Interfaces
	Protection Profile
	Log Setting
	Include List
	Exclude List
	Enable User Id.

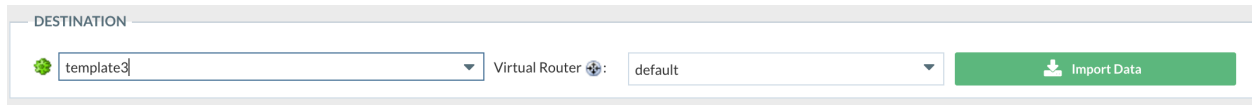
Minimum field mapping recommendations:

***Name, Type***



The above will provide enough information to create the zones. The interfaces can be included after the Zones have been imported.

The choosing of the template to import the zones into will be prompted by the option to choose the template prior to the 'Import Data' function.



DESTINATION

template3 Virtual Router: default Import Data

## Interfaces

COLUMN MAPPING	
Column	Field Mapping
col0	
col1	Name
col2	IP Address
	Netmask
	CIDR
	IP Address/CIDR
	IP Address/Netmask
	Secondary
	IP/Netmask
	Zone
	Vlan Tag
	Media



Minimum field mapping recommendations:

***Name, IP Address, Netmask of CIDR, Media***

The above will provide enough information to import the interfaces. After importing the interfaces, they can then be added to zones and virtual routers.

The choosing of the template to import the interfaces into will be prompted by the option to choose the template prior to the 'Import Data' function.

DESTINATION

  Virtual Router :  [Import Data](#)

## Appendix B – CSV File Formatting

When preparing your CSV files, a new feature added in Expedition ver 1.1.16 and newer will auto-populate the field mappings upon import of the CSV files.

This section will describe recommended formatting to take advantage of this feature.

On file import, the CSV reader will read the first line (column header) and look for the field mapping information. To take advantage of the automated field mapping feature, the headers need to match the spelling of the field mappings for each type of configuration file to be imported.

The writing of the column headers should be incorporated into scripts to parse and write the output to the CSV file.

The example below shows the recommended header for security rules. Each column header needs to be delimited with a semi-colon.

`from;to;action;src;service;dst;description`

A sample output from a CSV file for the security rules will look similar to the output.

```

access-rules.csv
1 from;to;action;src;service;dst;description
2 LAN;LAN - Public Comcast;allow;any;any;any;IPv4:From Any to Any for Any service
3 LAN;ARUBA-WiFi_DMZ;allow;any;any;any;IPv4:From Any to Any for Any service
4 LAN;ARUBA-WiFi_DMZ;allow;Group - Aruba - ClearPass Servers;Group - Aruba DMZ Ctrlr<->ClearPass;Group - Aruba - DMZ Controllers;
5 LAN;ARUBA-WiFi_DMZ;allow;Aruba Campus APs;Group - Aruba Controlr<->AP;Group - Aruba - DMZ Controllers;
6 LAN;ARUBA-WiFi_DMZ;allow;Group - Aruba - AirWave Servers;Group - Aruba AirWave to Controller;Group - Aruba - DMZ Controllers;
7 LAN;ARUBA-WiFi_DMZ;allow;Group - Aruba - Controllers;Group - Aruba Controlr<->Controlr;Group - Aruba - DMZ Controllers;
  
```

On file import, the CSV reader will read the column headers and will compare them against the available field mappings for the object type. If there is a matched field mapping, the field mapping will be auto-populated.

Col0	Col1	Col2	Col3	Col4	Col5	Col6
from	to	action	src	service	dst	description
LAN	LAN - Public Comcast	allow	any	any	any	IPv4:From Any to Any for An...
LAN	ARUBA-WIFI_DMZ	allow	any	any	any	IPv4:From Any to Any for An...
LAN	ARUBA-WIFI_DMZ	allow	Group - Aruba - ClearPass S...	Group - Aruba DMZ Ctrlr<->C...	Group - Aruba - DMZ Contr...	
LAN	ARUBA-WIFI_DMZ	allow	Aruba Campus APs	Group - Aruba Controlr<->AP	Group - Aruba - DMZ Contr...	
LAN	ARUBA-WIFI_DMZ	allow	Group - Aruba - AirWave Ser...	Group - Aruba AirWave to C...	Group - Aruba - DMZ Contr...	
LAN	ARUBA-WIFI_DMZ	allow	Group - Aruba - Controllers	Group - Aruba Controlr<->C...	Group - Aruba - DMZ Contr...	

Column	Field Mapping
col0	from
col1	to
col2	action
col3	src
col4	service
col5	dst
col6	description

The minimum recommended column headers for each object type is shown in the table below. Using these column headers will auto-populate the field mappings.

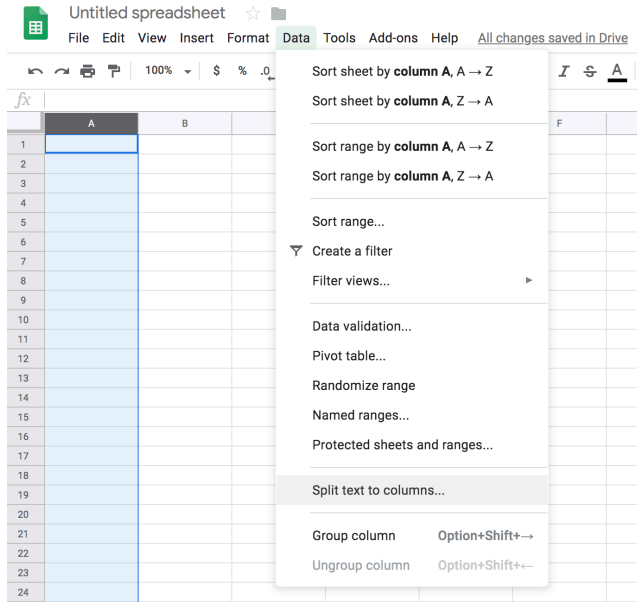
If the source configurations included additional field mappings that can be included, refer to Appendix A for the object type for the field mapping name for each specific object type.

Object Type	Required Column Headers
Address	name;ipaddress;network_host;netmask;ipaddress_range
Address Groups	name;members (members are delimited with a comma)
Services	name;protocol;dport
Services Groups	name;members (members are delimited with a comma)
Regions	name;address
Security rules	from;to;action;src;service;dst;description (A default name will be assigned)
Nat rules	from;to;src;dst;tp_source;tp_destination;description (A default name will be assigned)
Static routes	ipaddress;netmask;gateway;metric (A default name will be assigned)
Zones	name;type (for importing, recommend to make the Type as 'Layer3' as a default which can be changed later)
Interfaces	name;tag;ipaddress;netmask;media (for importing, recommend to make the 'media' as 'ethernet' as a default which can be changed later)

To check your CSV files that each line has the same number of columns, open the file in MS Excel or Google Sheets (if available for your use).

Using Google Sheets.

- **Create a new sheet**
- **Copy and paste your CSV data**
- **Use the option Data → Split text to columns**
- **Choose the delimiter as the semi-colon**



Using MS Excel.

- **Create a new sheet**
- **Copy and paste your CSV data**
- **Use the option Data → Text to columns**
- **Choose the delimiter as the semi-colon**

