Application Note

Automate the configuration of routers for NetFlow export

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1   Overview

For a Cisco Router to export NetFlow records to an Entuity server a set of changes must be made to its configuration. Some of the additional configuration lines apply to the whole router and other are required for each port.

This application note describes an approach to automating the configuration of routers for NetFlow record export using Entuity Configuration Management facilities. This would allow one or multiple routers to be configured using a pair of Configuration Management tasks.

# 2   Configuration Management definitions

Two tasks will be used to apply the configuration changes. One task will make the device level changes and the other will make the port level changes.

2.1   Device Task and Step definitions

The Configuration Management Step for making the necessary changes at the device level should be created first so that it can be incorporated in the corresponding Task. Here's how such a Step would be created:

Main Menu -> Administration -> Configuration Management -> Steps

Click "New" then fill in the Name, Description, Context and Script fields as follows:
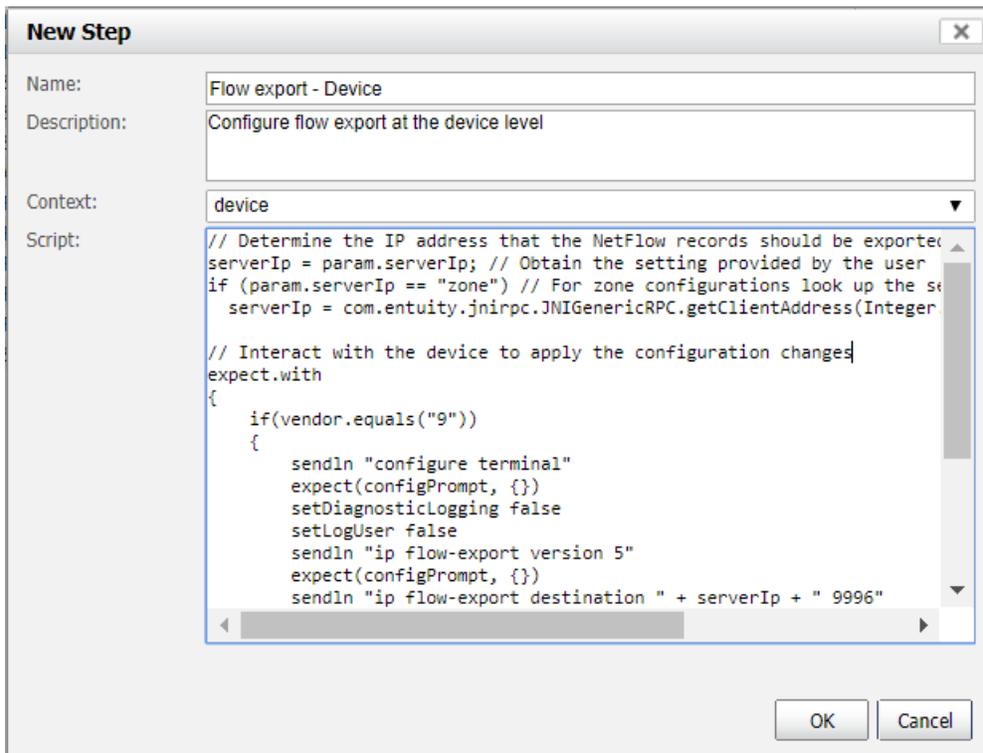
This is the text for the Script:

```
// Determine the IP address that the NetFlow records should be exported to
serverIp = param.serverIp; // Obtain the setting provided by the user
if (param.serverIp == "zone") // For zone configurations look up the server IP
  serverIp = com.entuity.jnirpc.JNIGenericRPC.getClientAddress(Integer.parseInt(device.devZoneID), false);

// Interact with the device to apply the configuration changes
expect.with
{
   if(vendor.equals("9"))
   {
      sendln "configure terminal"
      expect(configPrompt, {})
      setDiagnosticLogging false
      setLogUser false
      sendln "ip flow-export version 5"
      expect(configPrompt, {})
      sendln "ip flow-export destination " + serverIp + " 9996"
      expect(configPrompt, {})
      setLogUser true
      setDiagnosticLogging true
   }
   else
   {
      println "NO VALID METHOD FOR THIS DEVICE"
      throw new Exception("no valid method for this device")
   }
}
```
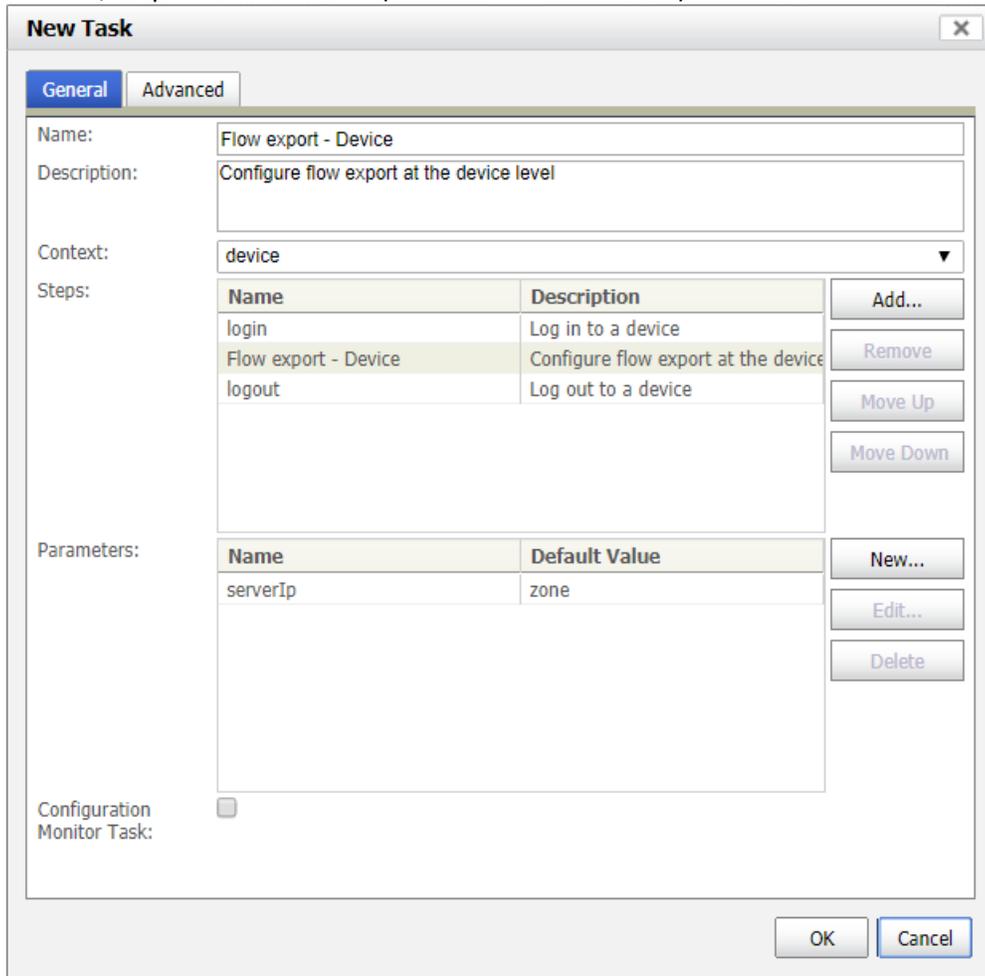
Once the new Step has been saved select the Tasks tab and click "New" and fill in the Name, Description, Context, Steps and Parameters (Name and Default Value):

This Task will log into the device, run the Step script defined earlier then log out. The user will be prompted for the serverIP which will default to "zone". If an explicit IP is entered, then it will be used. If the parameter is left with the default "zone" setting, then the appropriate IP will be looked up when used with a multi-zone configuration. If zones have not been configured, then the server IP that the flows should be exported to must be entered.

Select the Advanced tab then fill in the Filter and Selection Limit and check the Show on View Selection option:
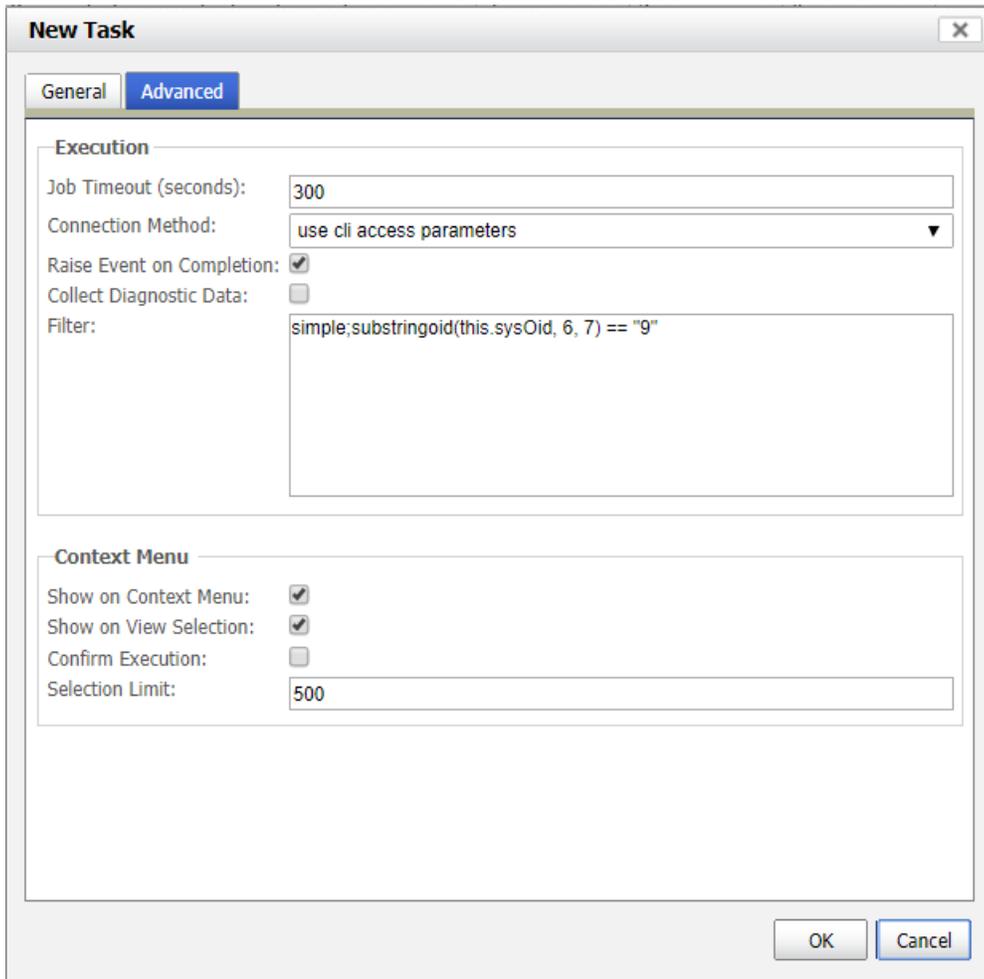
New Task ✕

General | Advanced

Execution

Job Timeout (seconds): 300

Connection Method: use cli access parameters ▼

Raise Event on Completion: ☑

Collect Diagnostic Data: ☐

Filter: simple;substringoid(this.sysOid, 6, 7) == "9"

Context Menu

Show on Context Menu: ☑

Show on View Selection: ☑

Confirm Execution: ☐

Selection Limit: 500

OK | Cancel

The statement used for the Filter restricts the use of this Task to Cisco devices only. Enabling the Show on View Selection option caused an option to be added to the view context menu that allows the task to be executed on all qualifying devices which, in this case, means all the Cisco devices. The Selection Limit is the largest number of devices that can be selected for a single Configuration Management operation.

2.2   Port Task and Step definitions

The Configuration Management Step for making the necessary changes at the port level should be created first so that it can be incorporated in the corresponding Task. Here's how such a Step would be created:

Administration -> Configuration Management -> Steps
Click "New" then fill in the Name, Description, Context and Script fields as follows:
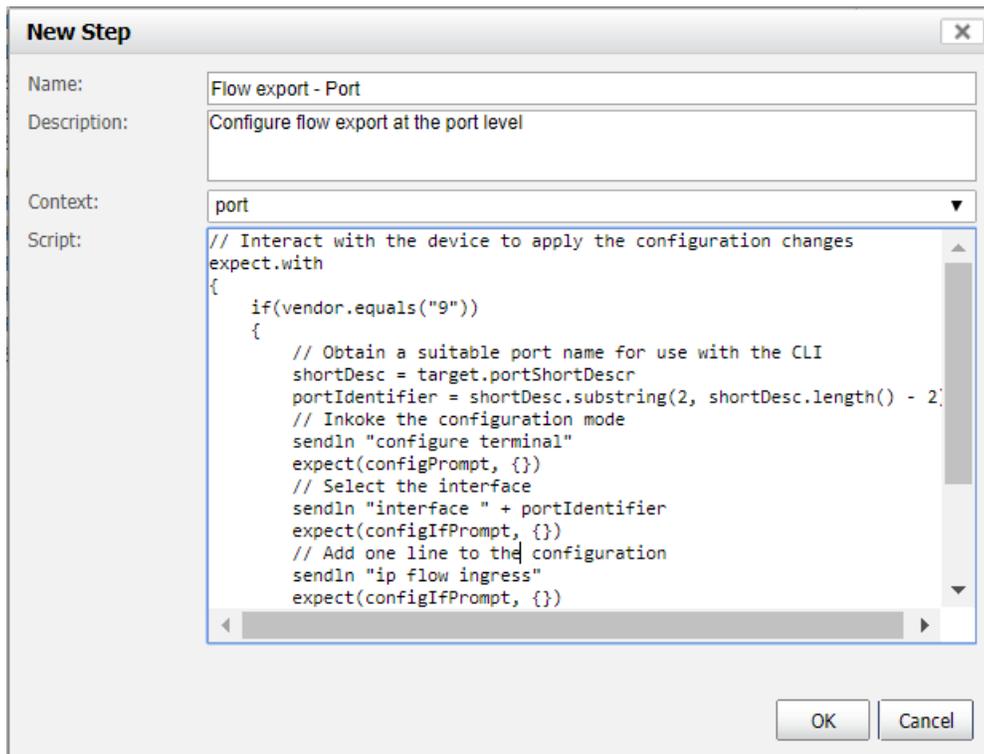
```
New Step                                                              [X]

Name:          Flow export - Port
Description:   Configure flow export at the port level

Context:       port                                                    ▼

Script:        // Interact with the device to apply the configuration changes
               expect.with
               {
                   if(vendor.equals("9"))
                   {
                       // Obtain a suitable port name for use with the CLI
                       shortDesc = target.portShortDescr
                       portIdentifier = shortDesc.substring(2, shortDesc.length() - 2
                       // Inkoke the configuration mode
                       sendln "configure terminal"
                       expect(configPrompt, {})
                       // Select the interface
                       sendln "interface " + portIdentifier
                       expect(configIfPrompt, {})
                       // Add one line to the configuration
                       sendln "ip flow ingress"
                       expect(configIfPrompt, {})

                                                    OK      Cancel
```

This is the text for the Script:

```
// Interact with the device to apply the configuration changes
expect.with
{
   if(vendor.equals("9"))
   {
         // Obtain a suitable port name for use with the CLI
      shortDesc = target.portShortDescr
      portIdentifier = shortDesc.substring(2, shortDesc.length() - 2)
         // Inkoke the configuration mode
      sendln "configure terminal"
      expect(configPrompt, {})
         // Select the interface
      sendln "interface " + portIdentifier
      expect(configIfPrompt, {})
         // Add one line to the configuration
      sendln "ip flow ingress"
      expect(configIfPrompt, {})
   }
   else
   {
      println "NO VALID METHOD FOR THIS DEVICE"
      throw new Exception("no valid method for this device")
   }
}
```

Once the new Step has been saved select the Tasks tab and click "New" and fill in the Name, Description, Context and Steps fields:
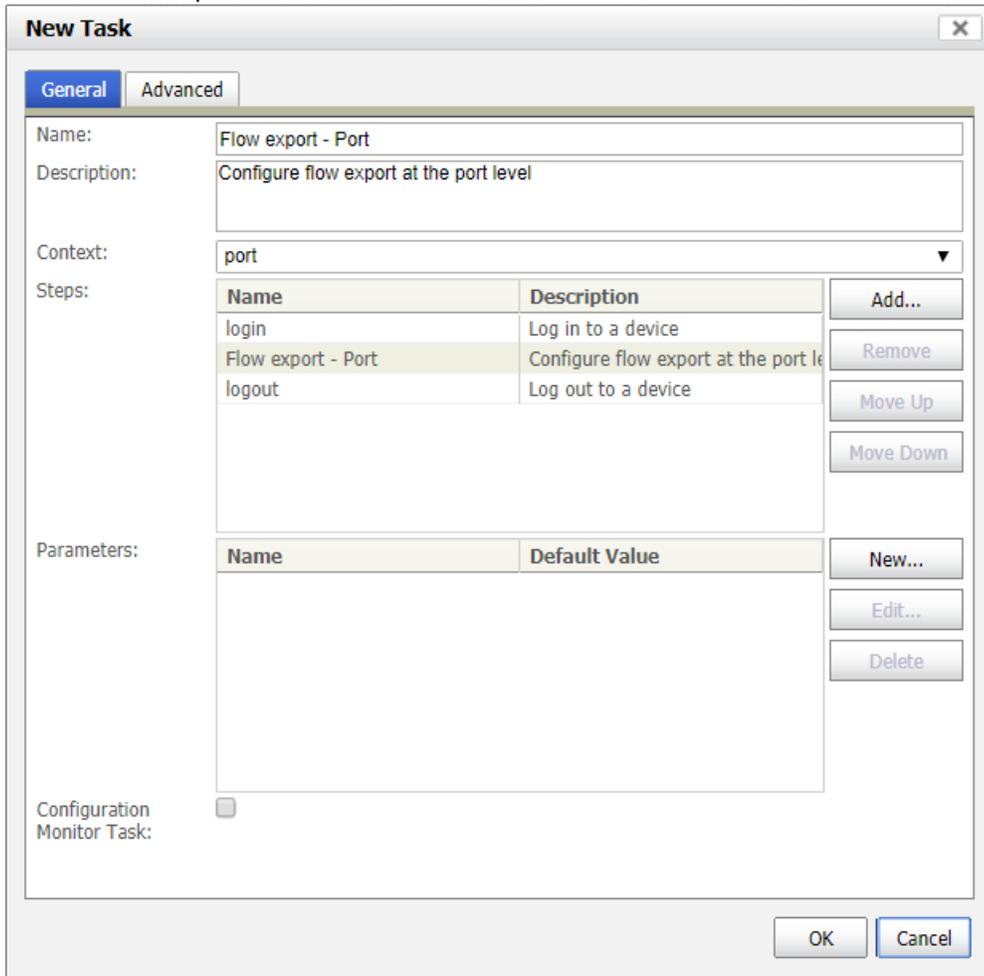
New Task ✕

| General | Advanced |

Name: Flow export - Port

Description: Configure flow export at the port level

Context: port ▼

Steps:

Name	Description
login	Log in to a device
Flow export - Port	Configure flow export at the port l
logout	Log out to a device

Add...
Remove
Move Up
Move Down

Parameters:

Name	Default Value

New...
Edit...
Delete

Configuration Monitor Task: ☐

OK Cancel

For each physical port on a device, this Task will log into the device, run the Step script defined earlier then log out.

Select the Advanced tab then fill in the Filter and Selection Limit and check the Show on View Selection option:
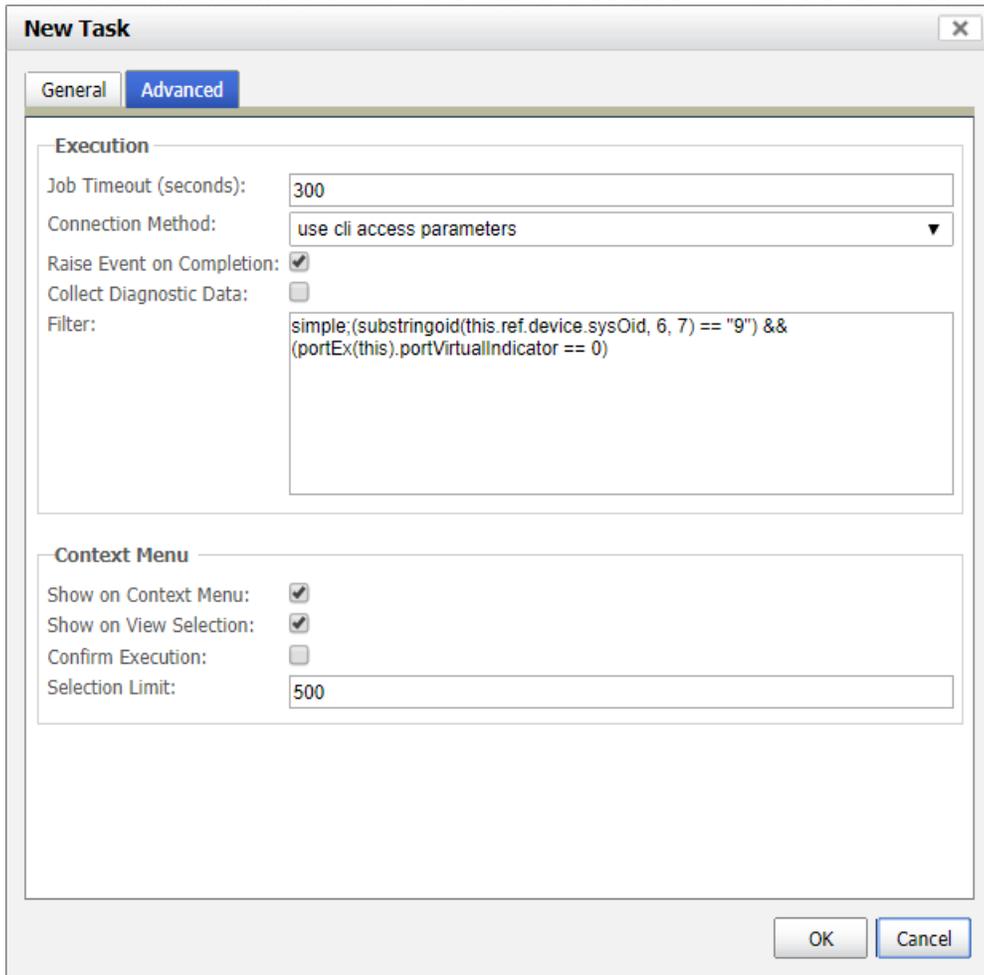
New Task

General | **Advanced**

Execution

Job Timeout (seconds): `300`

Connection Method: `use cli access parameters` ▼

Raise Event on Completion: ☑

Collect Diagnostic Data: ☐

Filter:
```
simple;(substringoid(this.ref.device.sysOid, 6, 7) == "9") &&
(portEx(this).portVirtualIndicator == 0)
```

**Context Menu**

Show on Context Menu: ☑

Show on View Selection: ☑

Confirm Execution: ☐

Selection Limit: `500`

OK | Cancel

The Filter statement not only restricts the use of this task to Cisco devices but also limits it to ports that are flagged as Physical via the Classification attribute. This avoids any attempt to enter NetFlow commands for virtual ports that don't exist in the CLI configuration.

3   Using the configuration automation tasks

In the Explorer, right click either an individual device or a view and select the *Configuration Management -> Flow export – Device* menu option. This corresponds to the new device level Task that's been created:
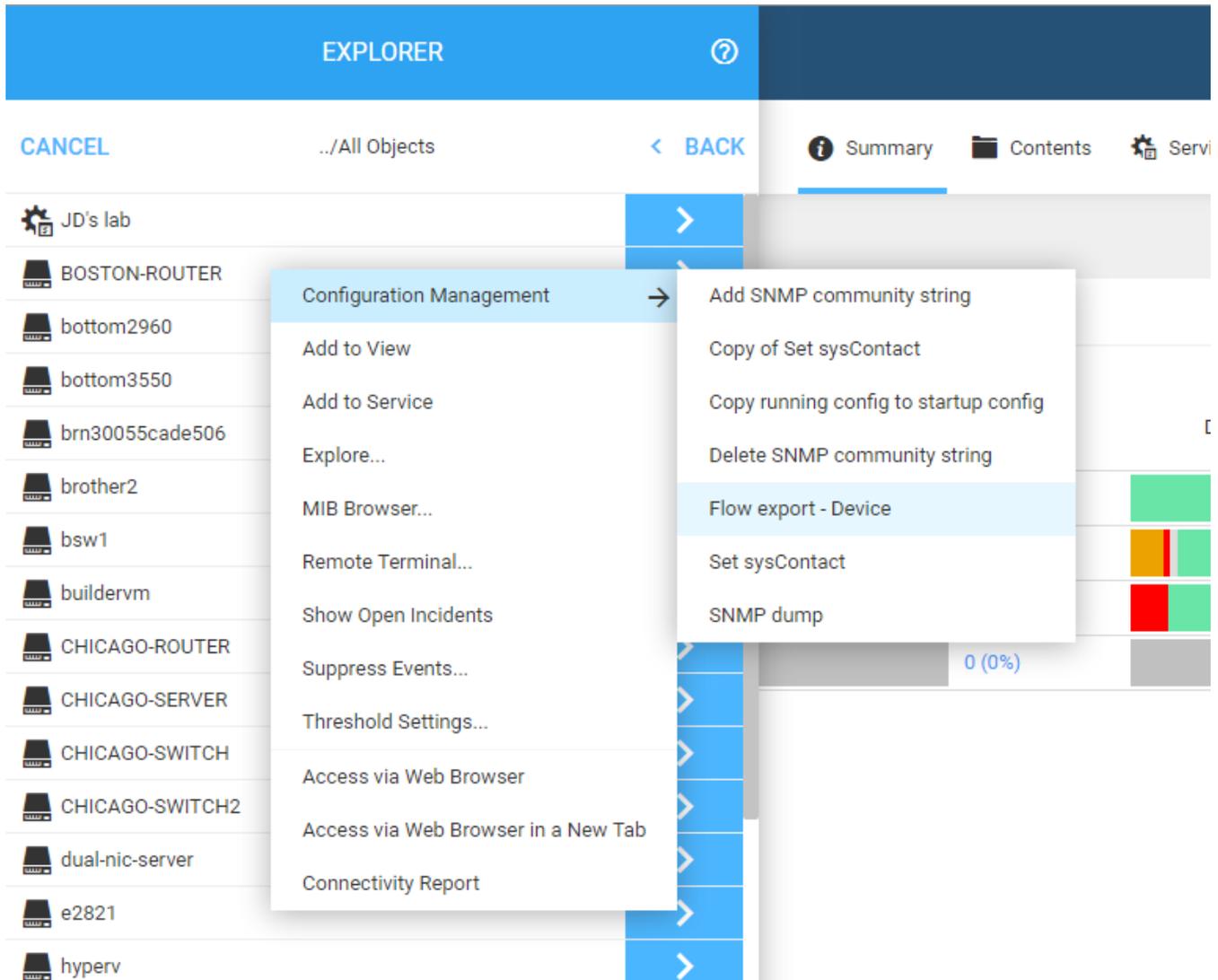
You'll be prompted for the IP address that the devices will need to be configured to export the flows to. If your server isn't configured to use Zones you must enter the appropriate IP address before clicking OK. If you're using Zones then leave the setting as "zone":
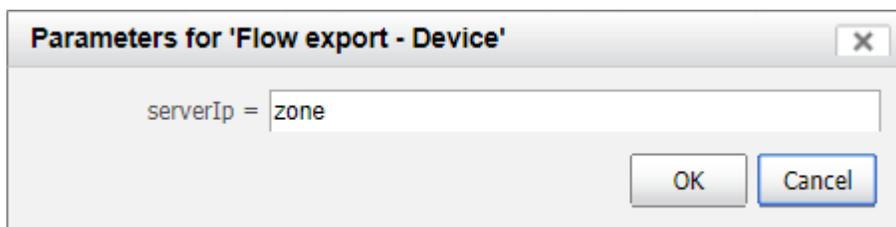
The port task can be run against all the ports of a device by multi-selecting those ports in the ports dashboard then selecting *Configuration Management -> Flow Export – Port* from the context menu. This option is also available from the view context menu which is how all the ports on all the devices in that view could be configured in one operation: