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“Starting out with Network Automation”

December 7, 2016

Brought to you by Vivit
Network Management SIG Leaders

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Getting Started with NA

Today we will cover some key areas as an introduction to the administration of Network Automation

- These areas will show you how to:
  - Add devices into Network Automation
  - Setup and Run Tasks that will collect data from devices
  - How to Report on that collected data
  - How to setup Compliance Policies, check them and discuss Remediation Scripts
  - How to use Command Scripts to perform changes on the network devices

Step #1

- We have NA installed, but there's still work to be done

  Step 1 involves adding devices into NA
  - We will discuss different methods of adding devices into NA
  - At the end of this step, we will have added four devices

Options for Adding Devices

- While this may go without saying, one of the first main steps with deploying NA is adding network devices
  - Wizard
    - You will see this option when you log into NA if you do not have any devices in Inventory
  - Import Task
    - This option is useful if you either are migrating from another tool to NA or if you have a listing of IPs or Hostnames
  - Discover Network Devices
    - This option will scan subnets for possible network devices.

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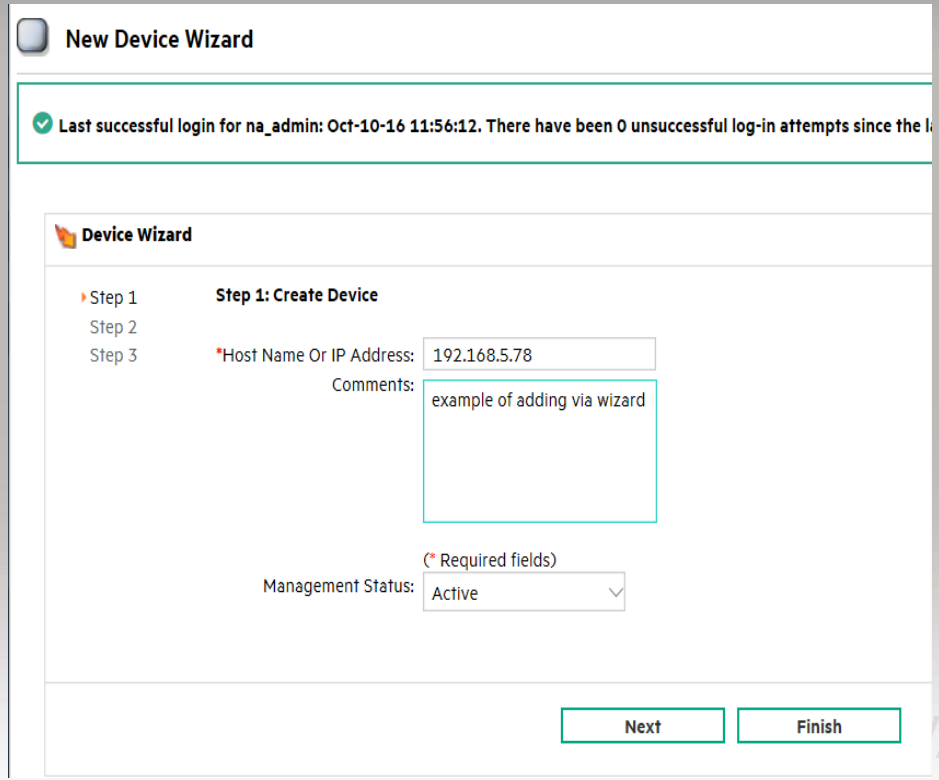
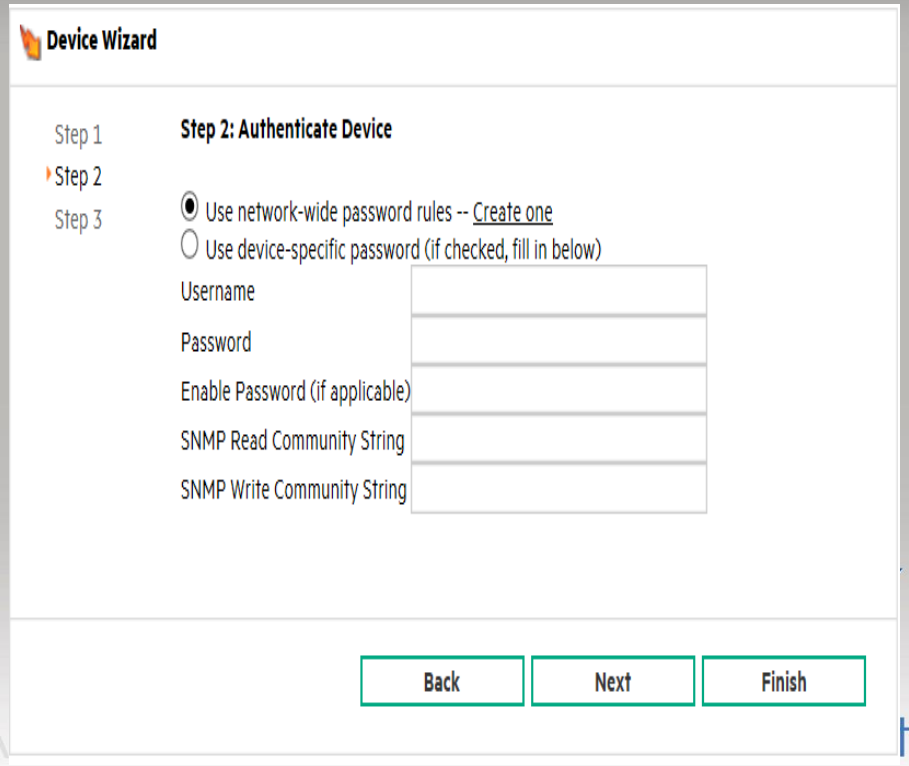
Options for Adding Devices

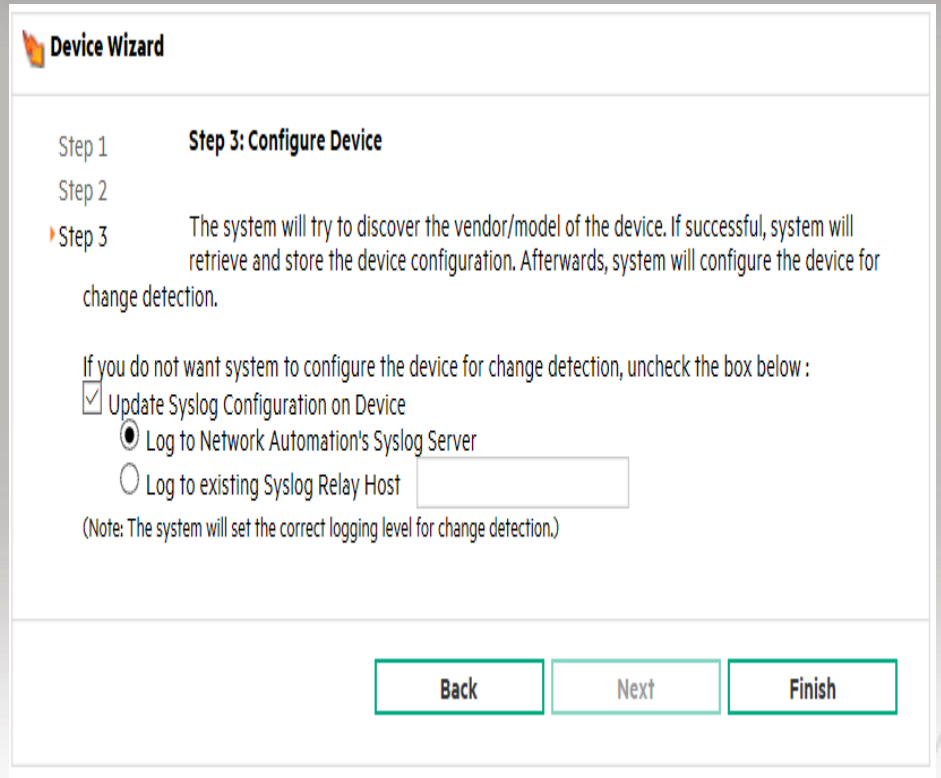
- Via Integrations (NNMi)
  - If you use NNMi, this is an excellent option, as you can configure NNMi to talk with NA and they will share information. NNMi will send the devices that are specified by a particular node group.

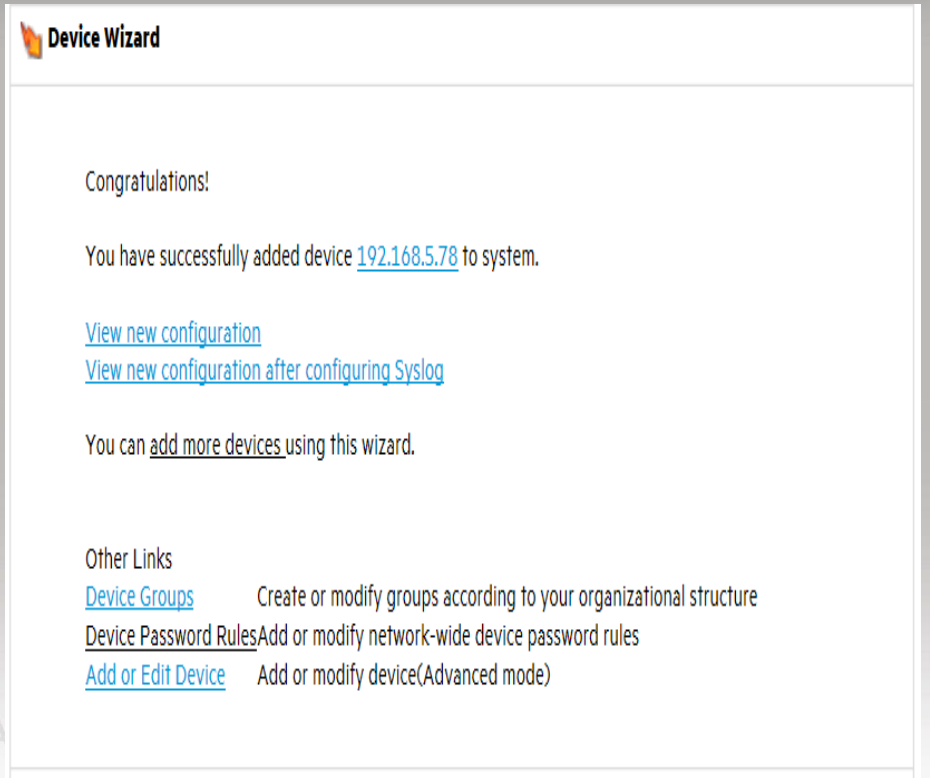
New Device Wizard



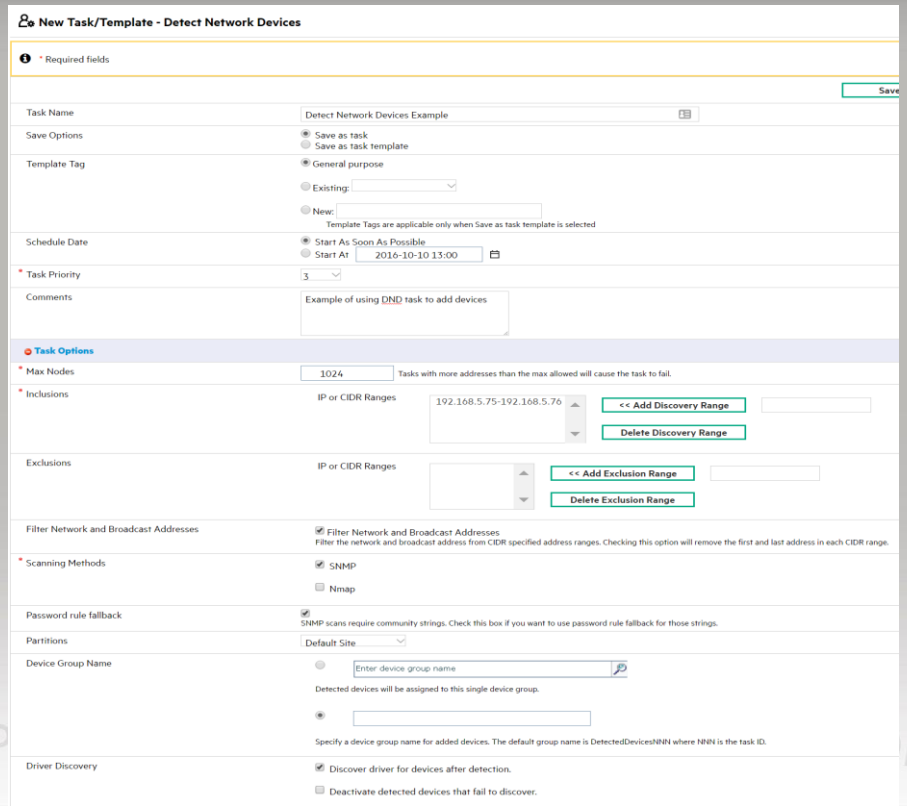


New Device Wizard





Detect Network Devices



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Detect Network Devices

General Information

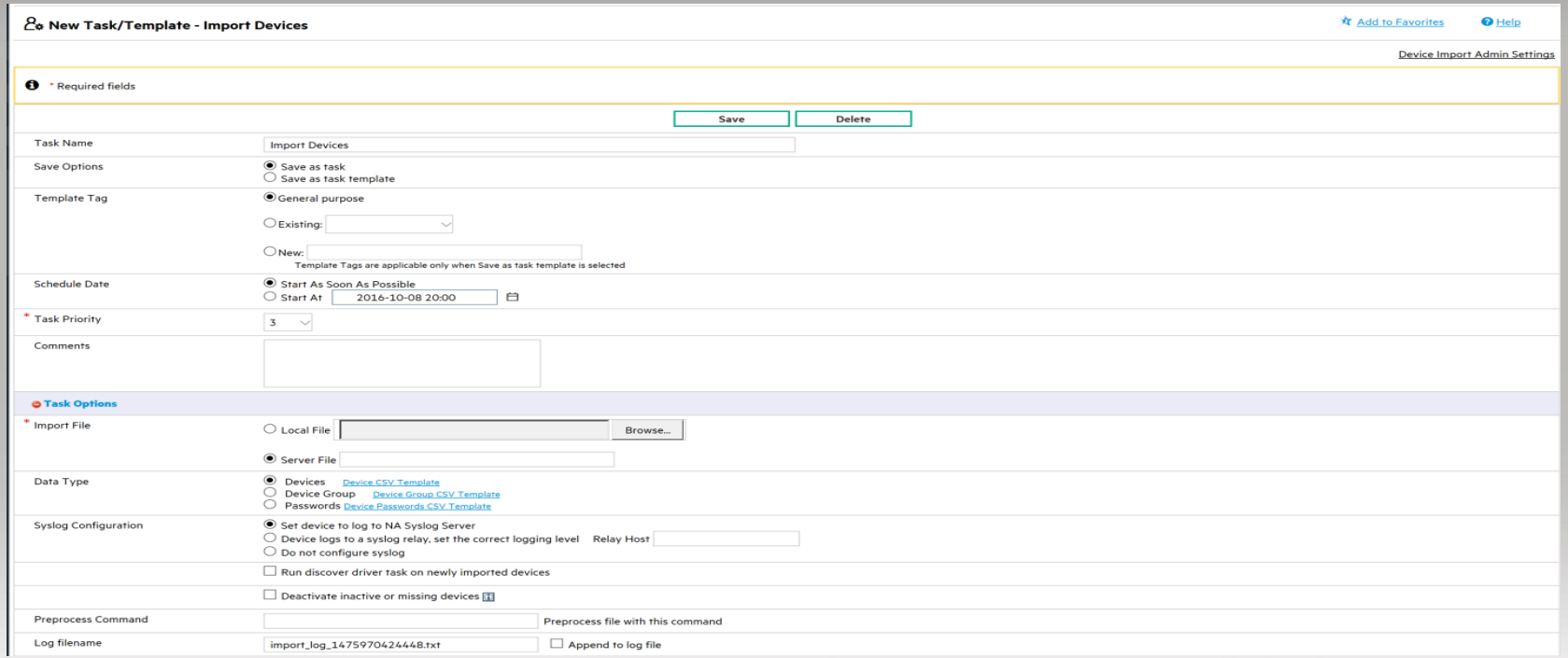
Task Name	Detect Network Devices Example
Task Status	**Succeeded**
Comments	Example of using DND task to add devices
Originator	na_admin
Task Priority	3
Create Date	Oct-10-16 12:17:58
Schedule Date	Oct-10-16 12:17:58
Start Date	Oct-10-16 12:17:58
Complete Date	Oct-10-16 12:18:00
Duration	2 second(s)
Repeat Type	Non-recurring

Additional Information

Result Details

Details: Task Completed	
Active nodes (Device Group: Detected Devices2481)	
192.168.5.75	Found via SNMP scan, SysOID: 1.3.6.1.4.1.9.1.222
192.168.5.76	Found via SNMP scan, SysOID: 1.3.6.1.4.1.9.1.222
Non-active nodes	
Unrecognized hosts	
Existing devices	
Total	

Import Devices



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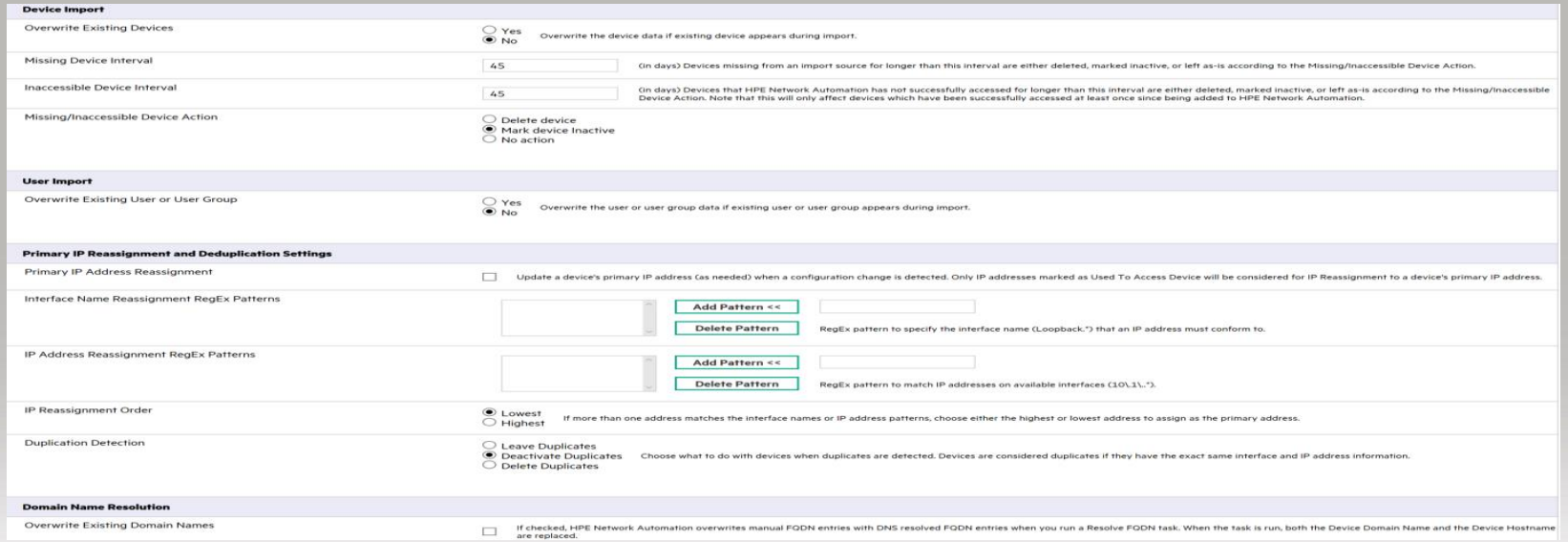
Options for Handling New Device

- There are also options you can change that are specific to how devices are handled during the import / add process



Device Import

Overwrite Existing Devices	○ Yes ◉ No	Overwrite the device data if existing device appears during import.
Missing Device Interval	45	(in days) Devices missing from an import source for longer than this interval are either deleted, marked inactive, or left as-is according to the Missing/Inaccessible Device Action.
Inaccessible Device Interval	45	(in days) Devices that HPE Network Automation has not successfully accessed for longer than this interval are either deleted, marked inactive, or left as-is according to the Missing/Inaccessible Device Action. Note that this will only affect devices which have been successfully accessed at least once since being added to HPE Network Automation.
Missing/Inaccessible Device Action	○ Delete device ◉ Mark device Inactive ○ No action	

User Import

Overwrite Existing User or User Group	○ Yes ◉ No	Overwrite the user or user group data if existing user or user group appears during import.

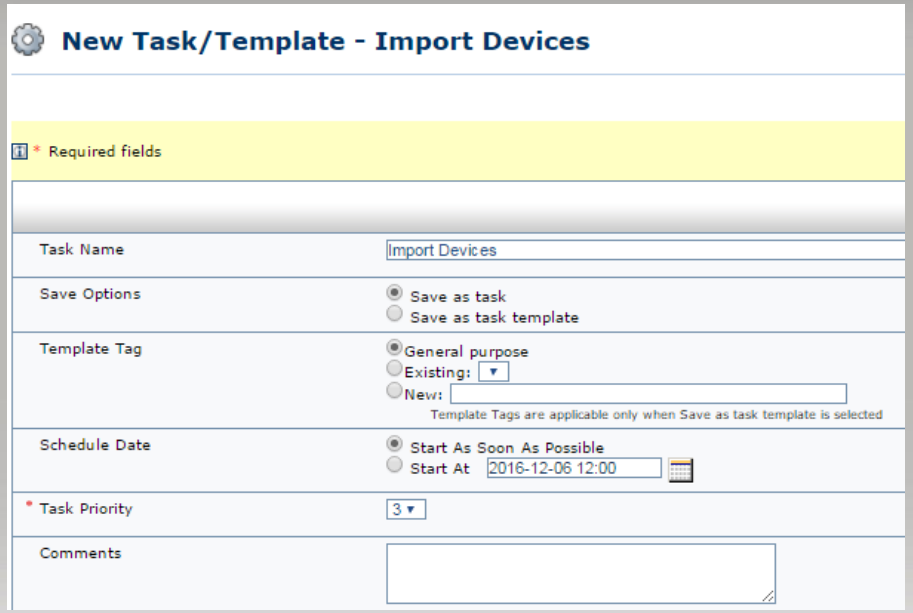
Primary IP Reassignment and Deduplication Settings

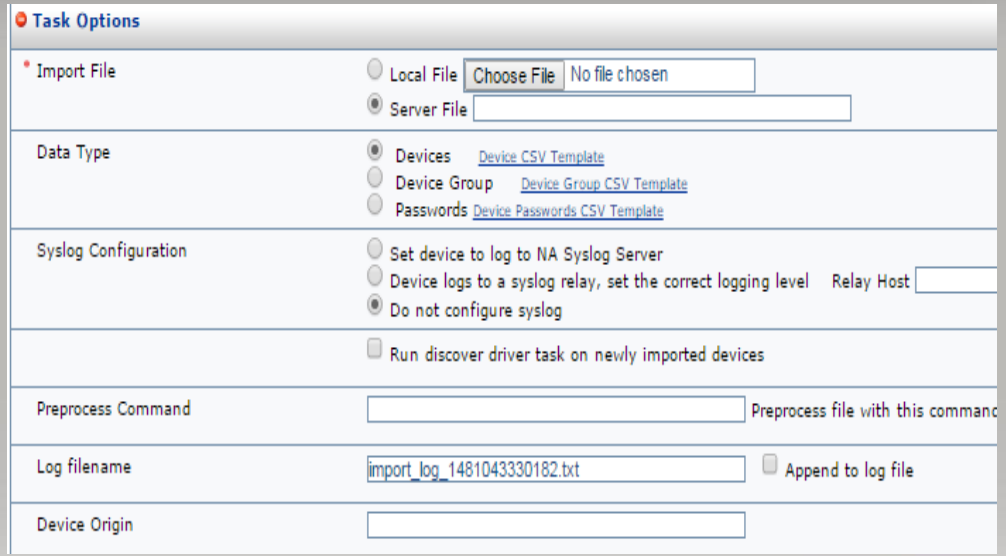
Primary IP Address Reassignment	☐	Update a device's primary IP address (as needed) when a configuration change is detected. Only IP addresses marked as Used To Access Device will be considered for IP Reassignment to a device's primary IP address.
Interface Name Reassignment RegEx Patterns	Add Pattern << / Delete Pattern	RegEx pattern to specify the interface name (Loopback.*) that an IP address must conform to.
IP Address Reassignment RegEx Patterns	Add Pattern << / Delete Pattern	RegEx pattern to match IP addresses on available interfaces (10\.1\..*).
IP Reassignment Order	◉ Lowest ○ Highest	If more than one address matches the interface names or IP address patterns, choose either the highest or lowest address to assign as the primary address.
Duplication Detection	○ Leave Duplicates ◉ Deactivate Duplicates ○ Delete Duplicates	Choose what to do with devices when duplicates are detected. Devices are considered duplicates if they have the exact same interface and IP address information.

Domain Name Resolution

Overwrite Existing Domain Names	☐	If checked, HPE Network Automation overwrites manual FQDN entries with DNS resolved FQDN entries when you run a Resolve FQDN task. When the task is run, both the Device Domain Name and the Device Hostname are replaced.

Import Devices





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Device.csv Template for Import Task

- This is an example of the device.csv template
  - I have taken a basic approach and just specified the IP or hostname for a few devices
  - As you will notice when you work with the file, there are many columns (options) you can specify.
    - These are detailed in the help text (next page)

A	B	C	D
primaryIPAddress	hostName	siteName	deviceGroupName
192.168.5.77			

Import Template Fields

Device Data Import File

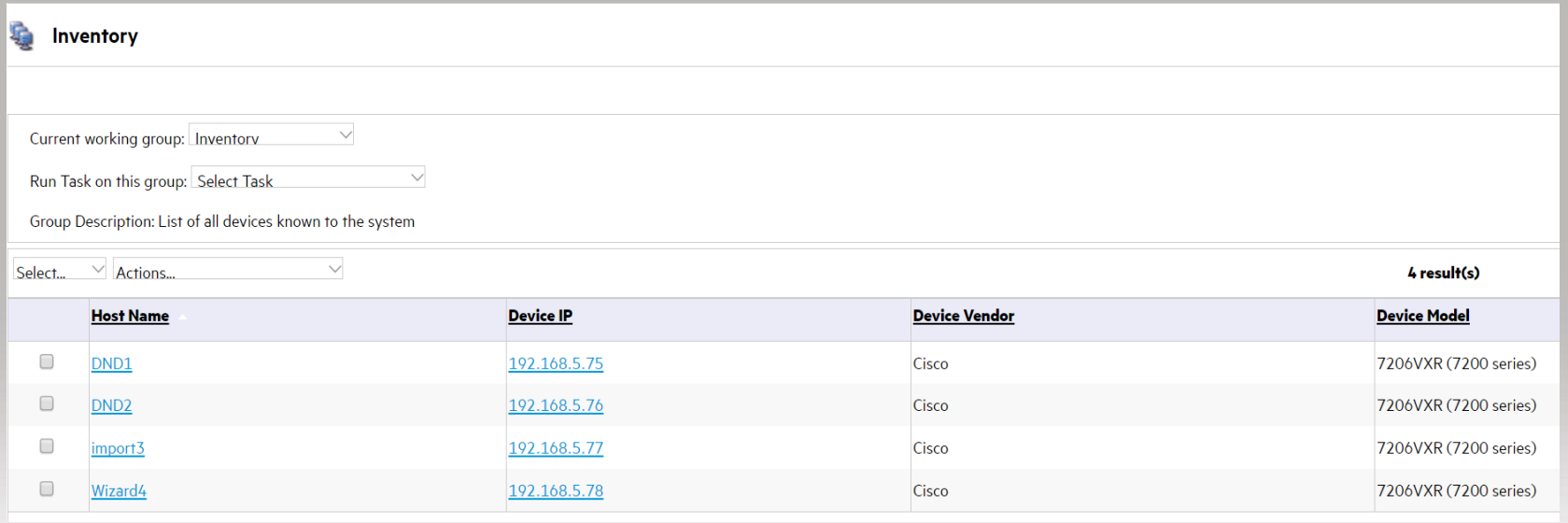
The *device.csv* template file contains the NA database column names for device data. During import, NA uses the values in the primaryIPAddress and hostName columns, combined
Populate at least one of the primaryIPAddress or hostName columns.

Device Import File Fields

Column Name	Description/Action
primaryIPAddress	The primary IP address for the device. Either the primaryIPAddress or the hostName column must be included in each device data import file. **Note**: In a NAT environment, specify the IP address that NA should use to access the device. **Note:** This value can be set at device creation only.
hostName	The host name of the device. Either the primaryIPAddress or the hostName column must be included in each device data import file. **Note:** This value can be set at device creation only.
siteName	The name of the site (partition) to which the device belongs. **Note:** This value can be set at device creation only. It takes precedence over the Site selected on the Import Devices task page.
deviceGroupName	A colon-separated list of the device groups that contain the device. If a device group name does not exist, NA creates that device group with default properties.
deviceDriver	The name of the device driver. **Tip:** It is recommended to not specify a device driver and let NA determine which driver to use.
excludeFromPoll	The polling setting for the device. Specify one of the following numeric values: • 1 — Disabled (do not poll the device automatically) • 2 — Polling Only (poll the device for changes as part of the regular polling task only)
managementStatus	The management status of the device. Specify one of the following numeric values: • 0 — Active (managed)

New Devices

So, after our different methods of adding devices into NA, we have these devices managed by NA



Inventory

Current working group: Inventory

Run Task on this group: Select Task

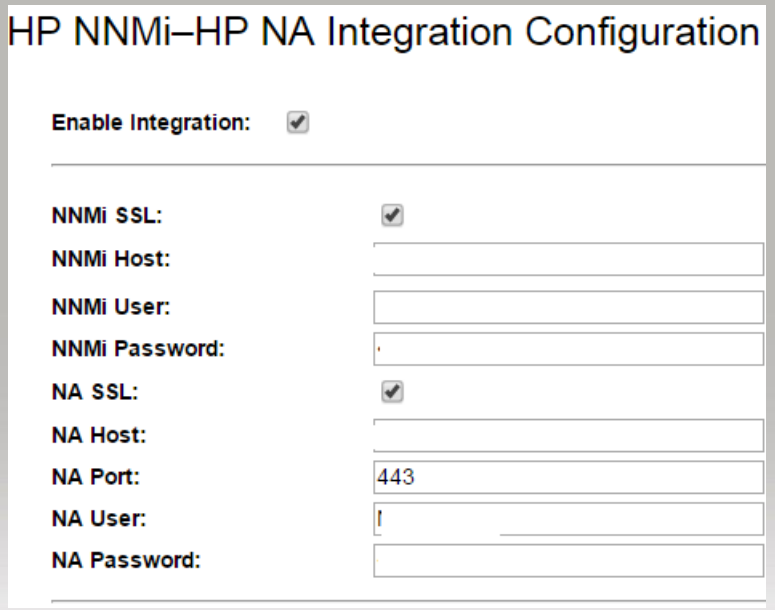
Group Description: List of all devices known to the system

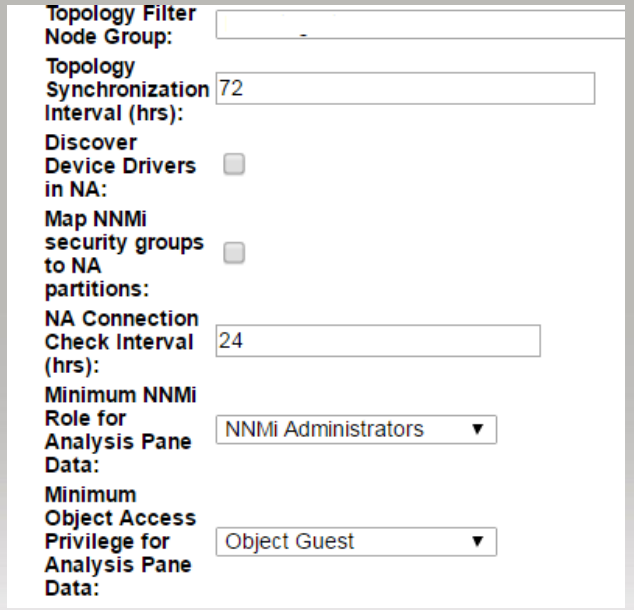
Select... Actions... 4 result(s)

Host Name	Device IP	Device Vendor	Device Model
DND1	192.168.5.75	Cisco	7206VXR (7200 series)
DND2	192.168.5.76	Cisco	7206VXR (7200 series)
import3	192.168.5.77	Cisco	7206VXR (7200 series)
Wizard4	192.168.5.78	Cisco	7206VXR (7200 series)

NNMi Integration

This is done on the NNMi side





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Step #2

We completed getting our devices into NA

- Now we will talk about some basic tasks that collect information from the devices and store in the database

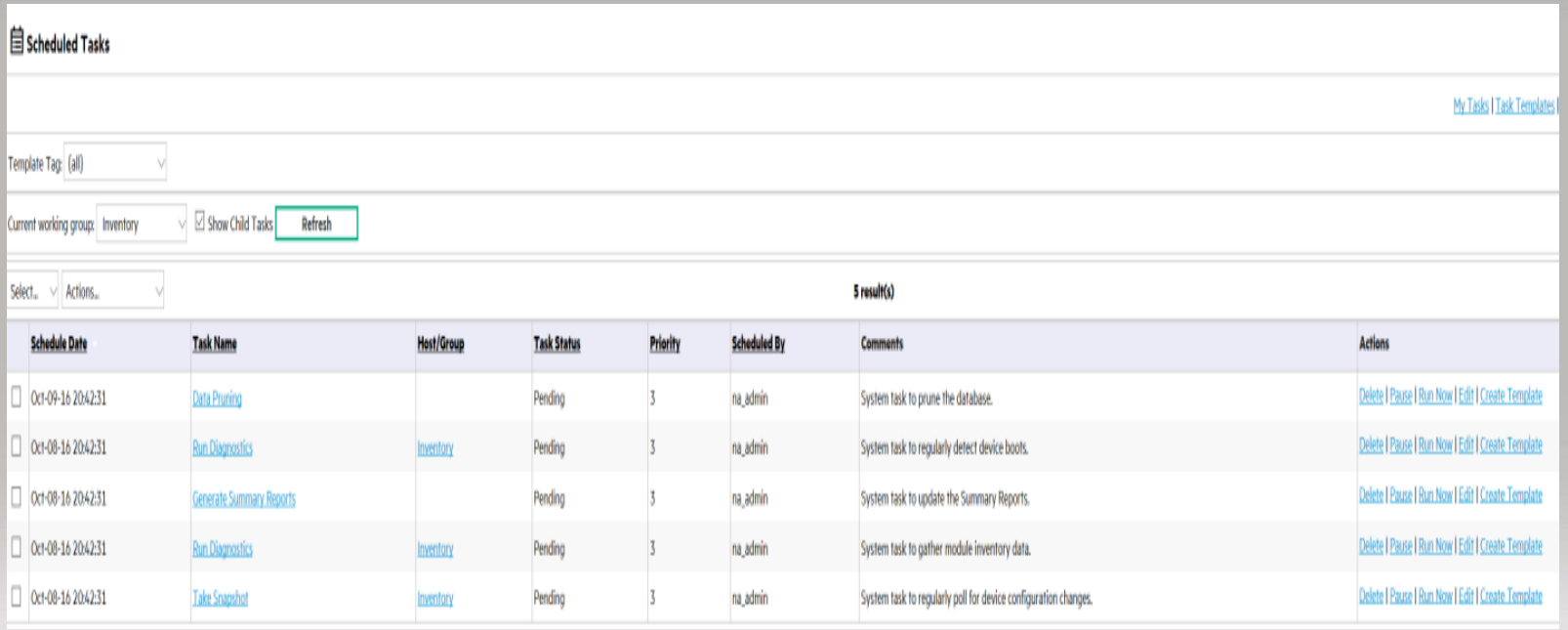
Setup and Run Tasks that will Collect Data from Devices

- There are numerous “tasks” within NA, each that has a purpose
- Here I’ll talk about a couple that are responsible for collecting data

  This data could be:

  - Configurations (Snapshots)
  - Statistical data (Diagnostics)
    - Interface information
    - Routing tables
    - Custom information that is important for you / your company

Default Scheduled Tasks



Scheduled Tasks

My Tasks | Task Templates |

Template Tag: (all)

Current working group: Inventory ☑ Show Child Tasks Refresh

Select... Actions... 5 result(s)

Schedule Date	Task Name	Host/Group	Task Status	Priority	Scheduled By	Comments	Actions
Oct-09-16 20:42:31	Data Pruning		Pending	3	na_admin	System task to prune the database.	Delete | Pause | Run Now | Edit | Create Template
Oct-08-16 20:42:31	Run Diagnostics	Inventory	Pending	3	na_admin	System task to regularly detect device boots.	Delete | Pause | Run Now | Edit | Create Template
Oct-08-16 20:42:31	Generate Summary Reports		Pending	3	na_admin	System task to update the Summary Reports.	Delete | Pause | Run Now | Edit | Create Template
Oct-08-16 20:42:31	Run Diagnostics	Inventory	Pending	3	na_admin	System task to gather module inventory data.	Delete | Pause | Run Now | Edit | Create Template
Oct-08-16 20:42:31	Take Snapshot	Inventory	Pending	3	na_admin	System task to regularly poll for device configuration changes.	Delete | Pause | Run Now | Edit | Create Template

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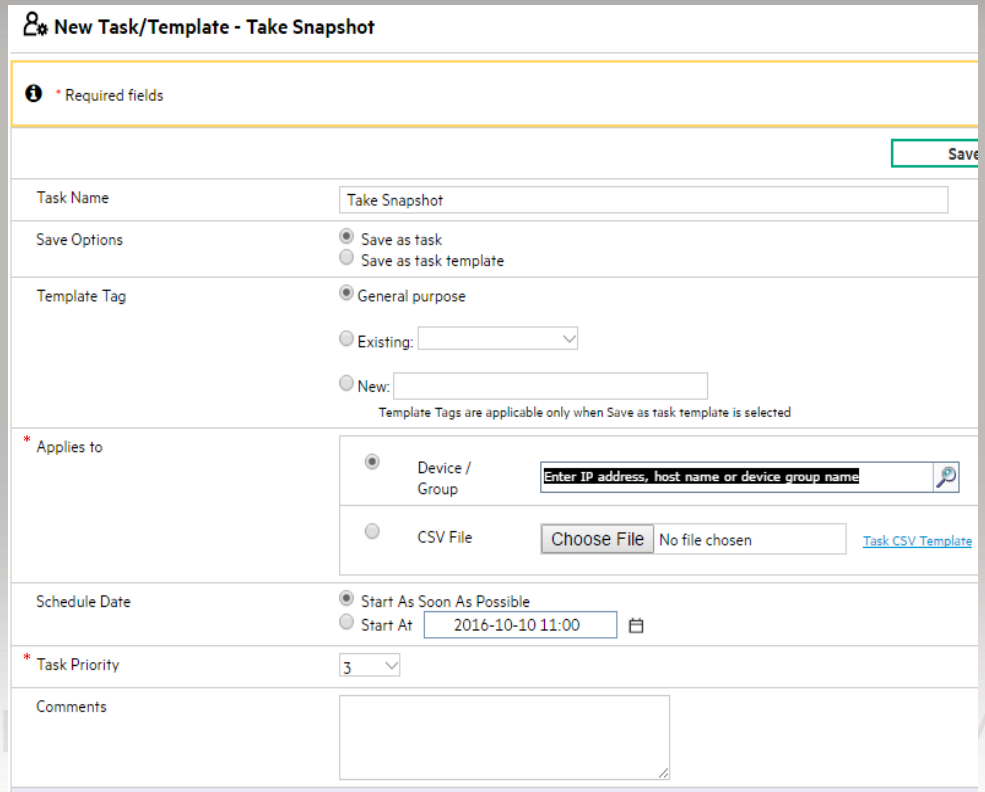
Snapshot Task Form



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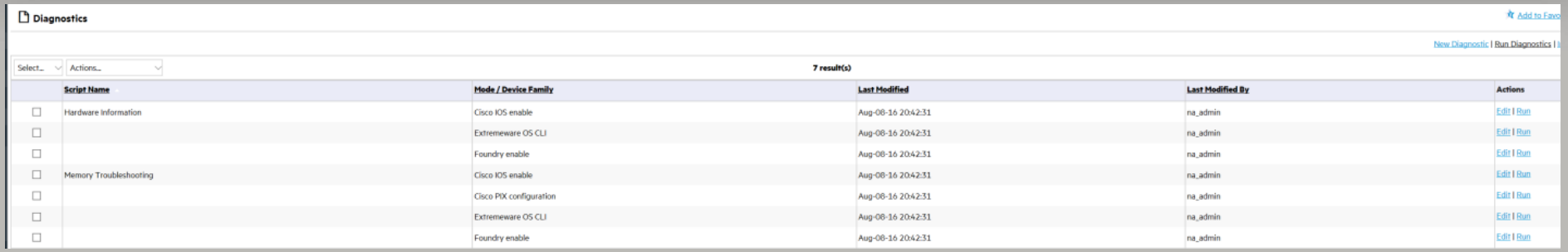
Default Diagnostics



It is very simple to add your own “custom” diagnostics

- It can be just a single “show” command
- You can use a language such a Perl or Expect to add logic in to do more within your diagnostic

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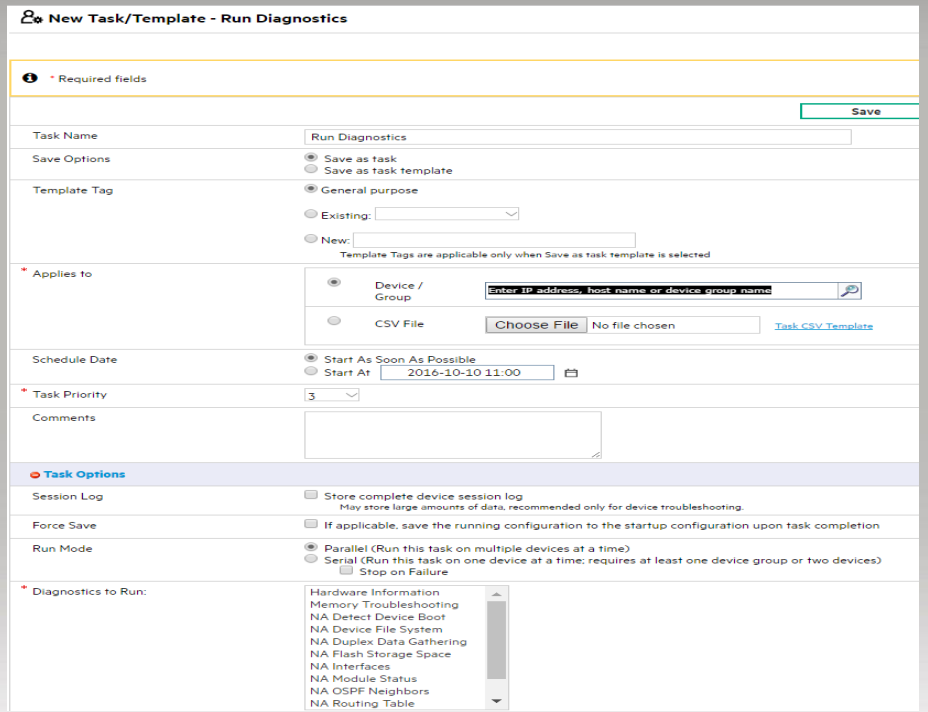
Diagnostics Task Form

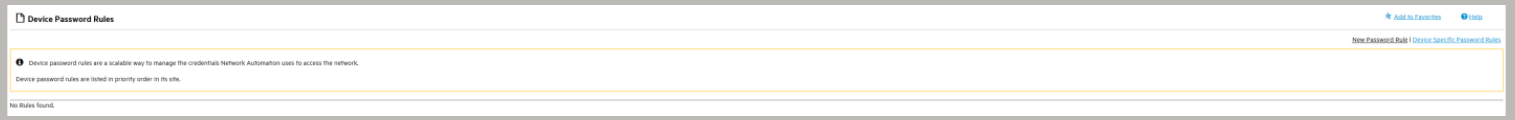


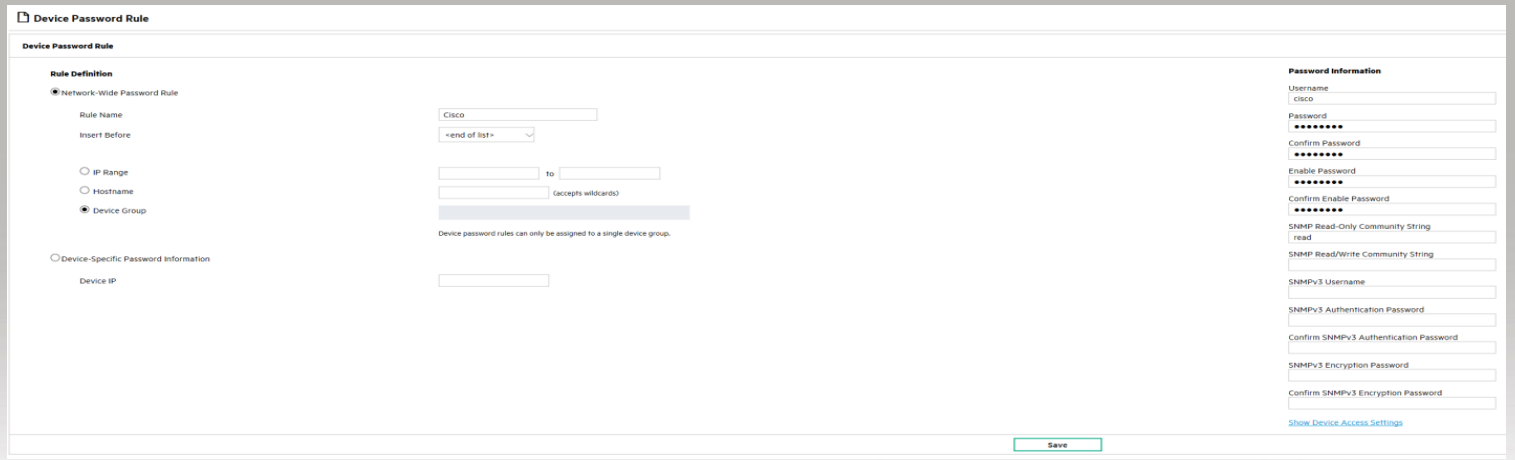
It is very simple to add your own "custom" diagnostics

- It can be just a single "show" command
- You can use a language such a Perl or Expect to add logic in to do more within your diagnostic

Credentials

- Device Specific Credentials
- Device Password Rules





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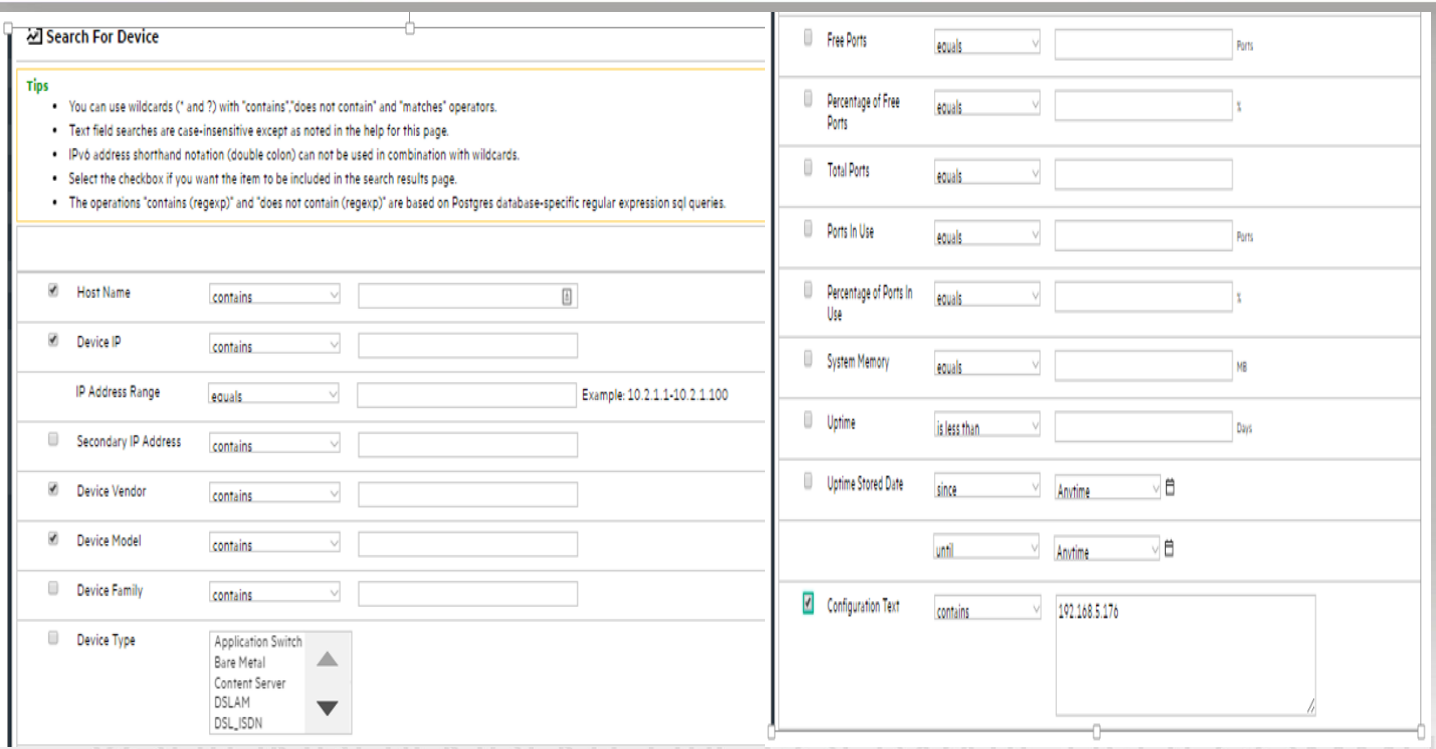
Step #3

- We have devices in NA
- We have collected configurations and diagnostics
- Now we will work with reports to look at some of the stored data

Reporting on Collected Data



In this example, I'm looking to see if the configs have the syslog entry I'm interested in

If so, it should have the IP of NA: 192.168.5.176

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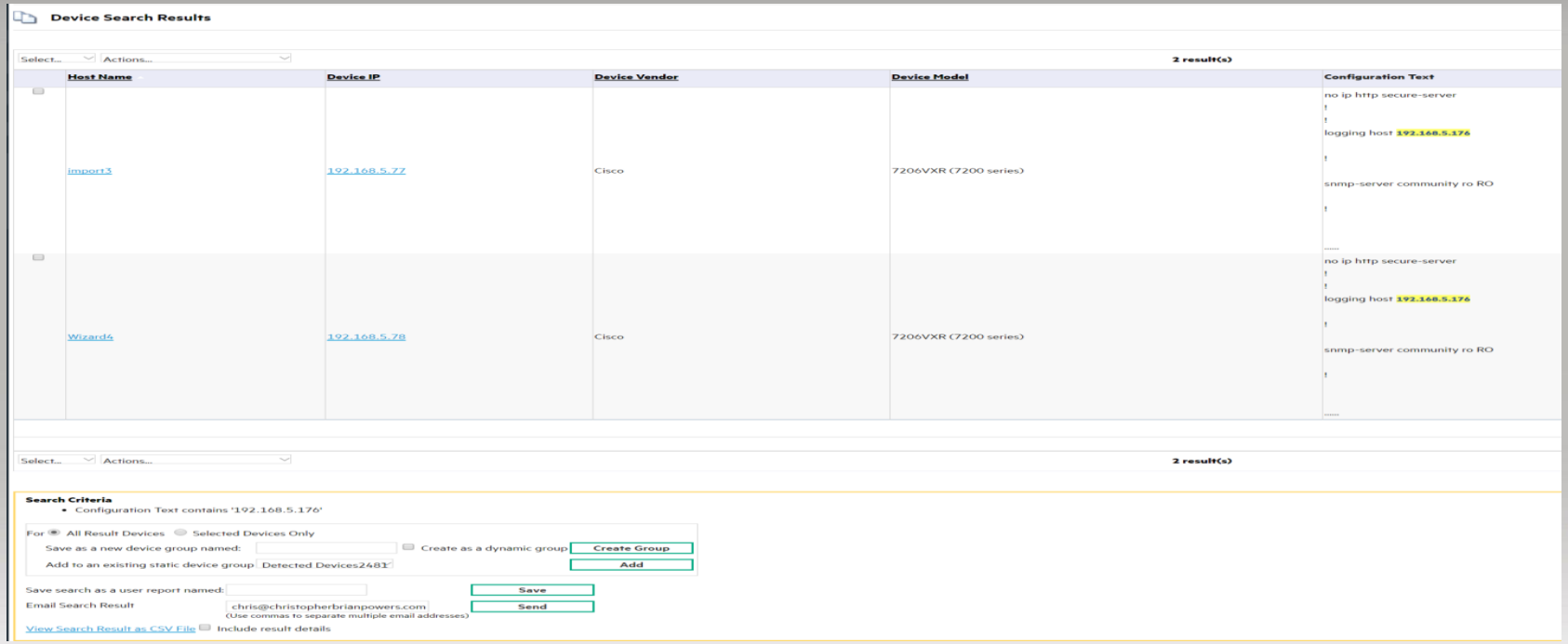
Reporting on Collected Data



Device Search Results

Select... Actions... 2 result(s)

Host Name	Device IP	Device Vendor	Device Model	Configuration Text
import3	192.168.5.77	Cisco	7206VXR (7200 series)	no ip http secure-server ! ! logging host 192.168.5.176 ! snmp-server community ro RO ! .....
Wizard4	192.168.5.78	Cisco	7206VXR (7200 series)	no ip http secure-server ! ! logging host 192.168.5.176 ! snmp-server community ro RO ! .....

Select... Actions... 2 result(s)

Search Criteria
- Configuration Text contains '192.168.5.176'

For All Result Devices Selected Devices Only
Save as a new device group named: Create as a dynamic group Create Group
Add to an existing static device group Detected Devices2481 Add

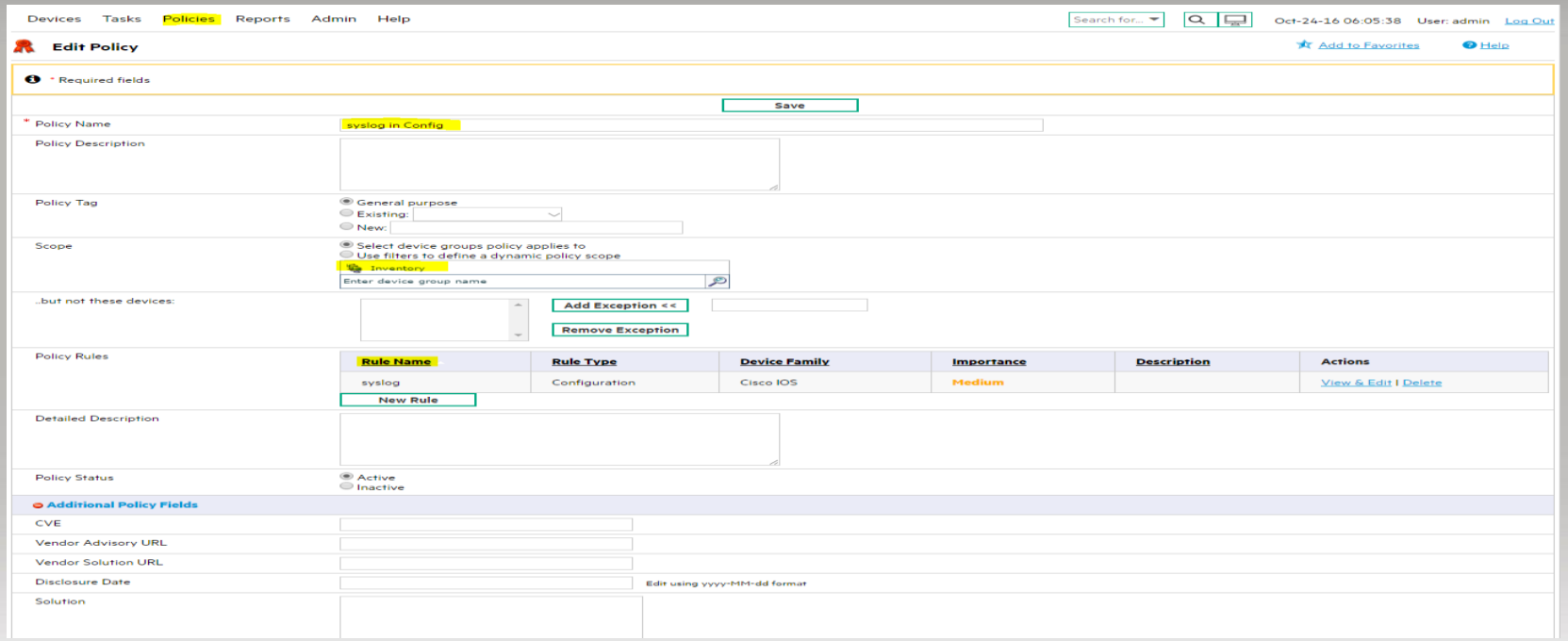
Save search as a user report named: Save
Email Search Result chris@christopherbrianpowers.com Send
(Use commas to separate multiple email addresses)
View Search Result as CSV File Include result details

Step #4

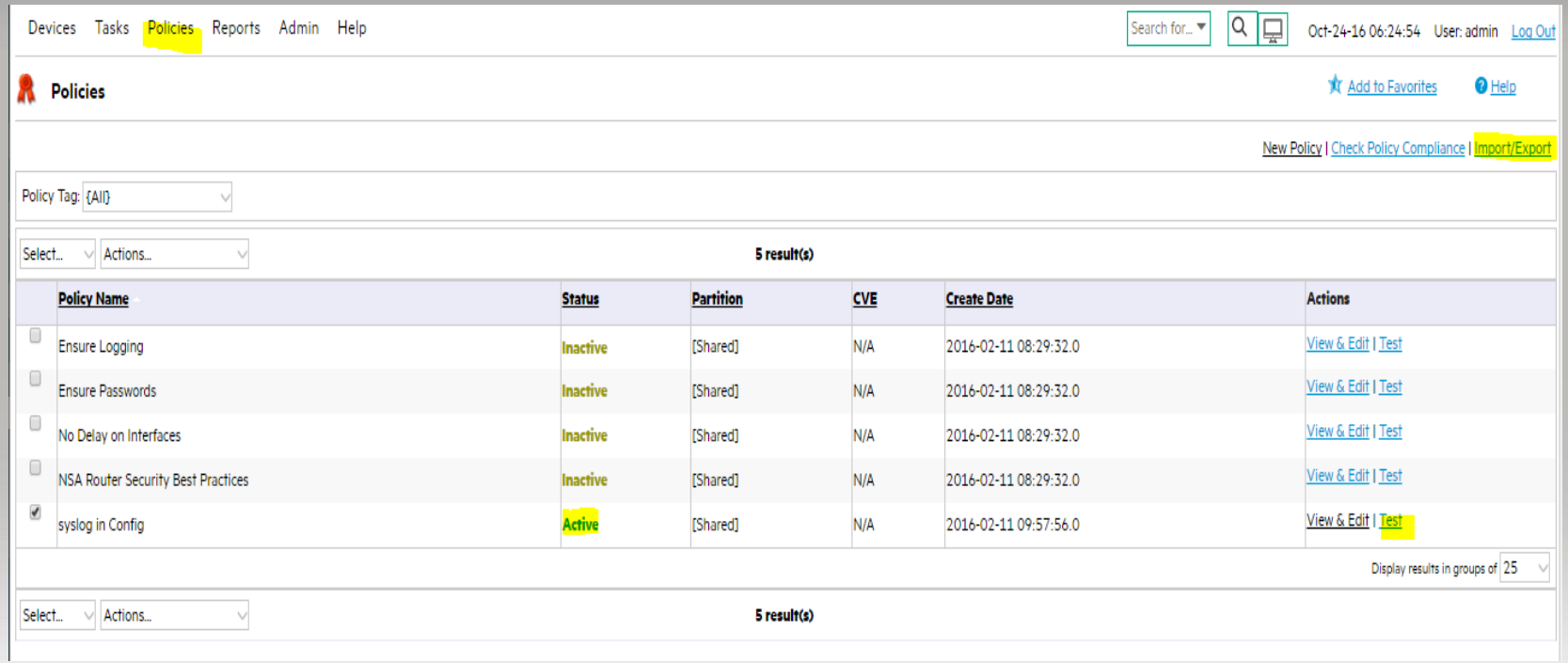
- We have devices in NA
- Configurations and Diagnostics collected
- We created a report and saw that we didn't find what we should have

- It's now time to talk about Compliance and Remediation
  - At the end of this step, we will have created a Policy around syslog and will use auto-remediation to resolve the two non-compliant devices

Defining New Policy



Testing for Compliance



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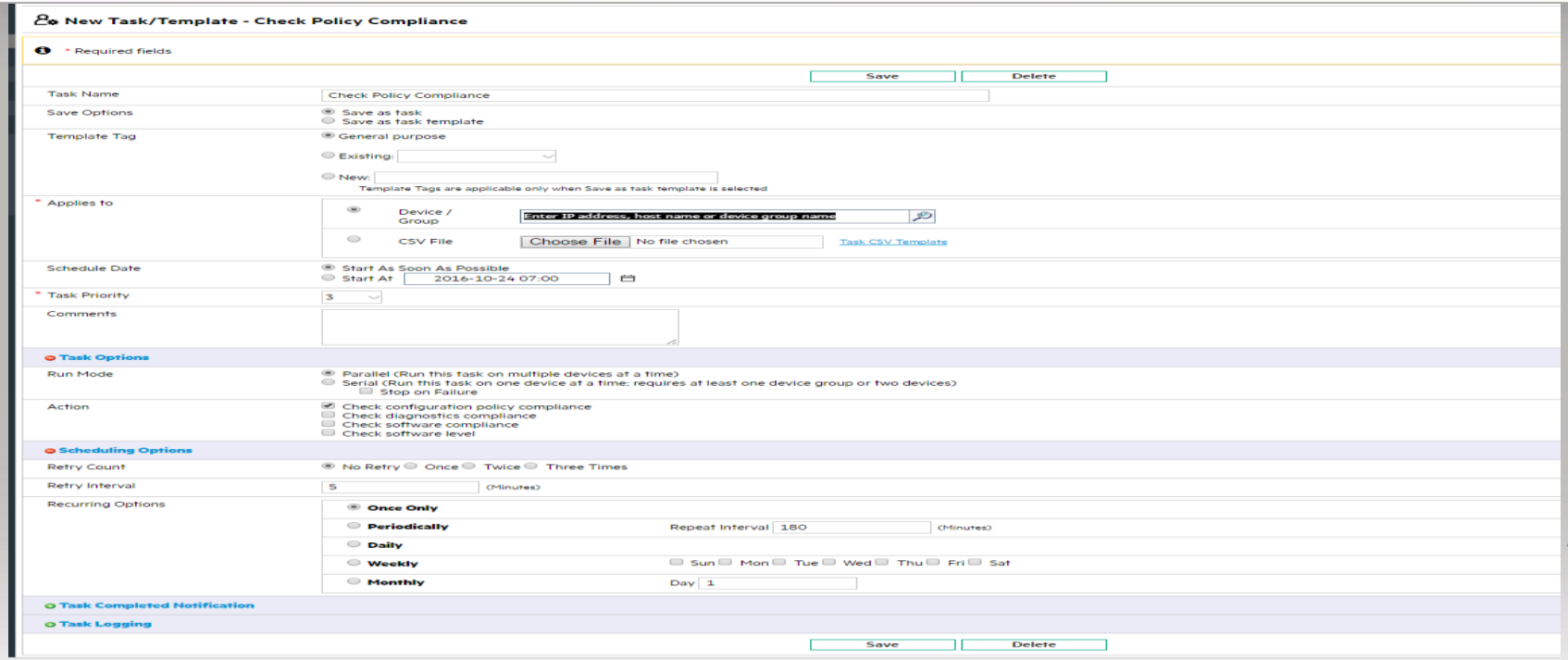
Scheduling Policy Check



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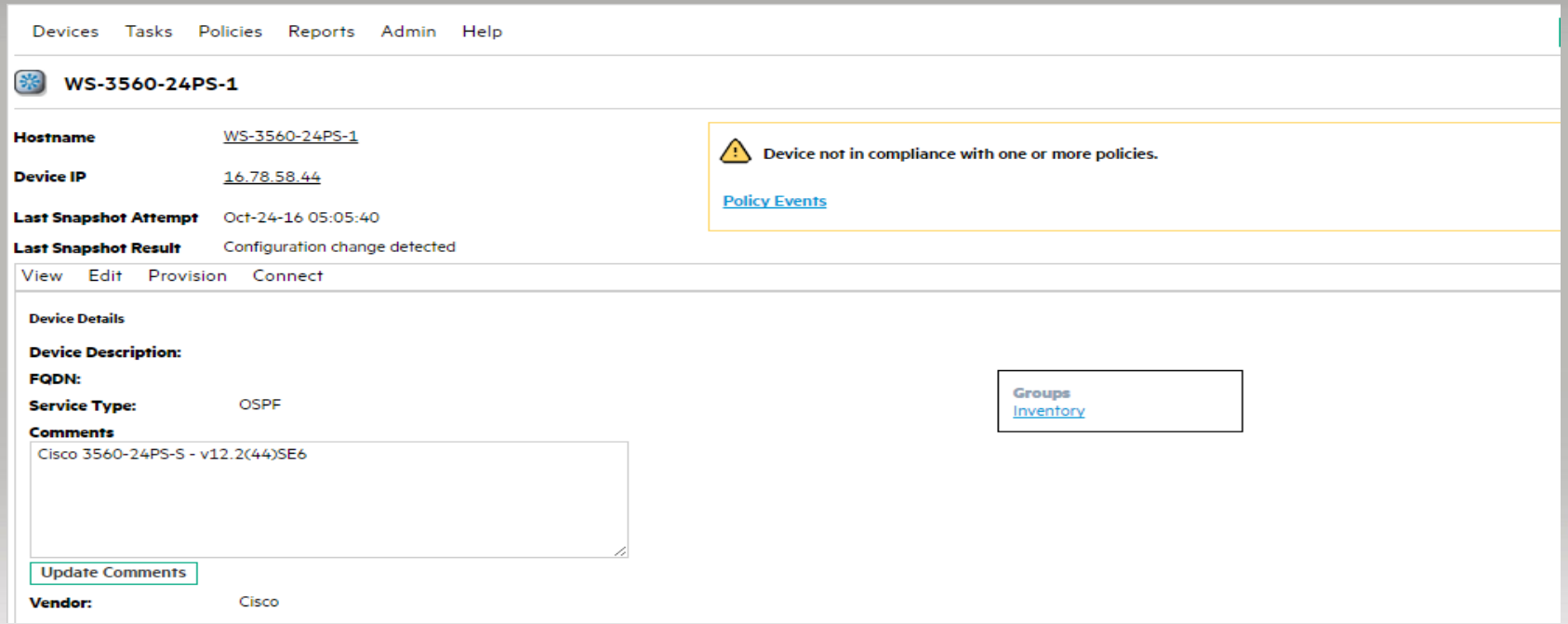
Policy Violations Highlighted



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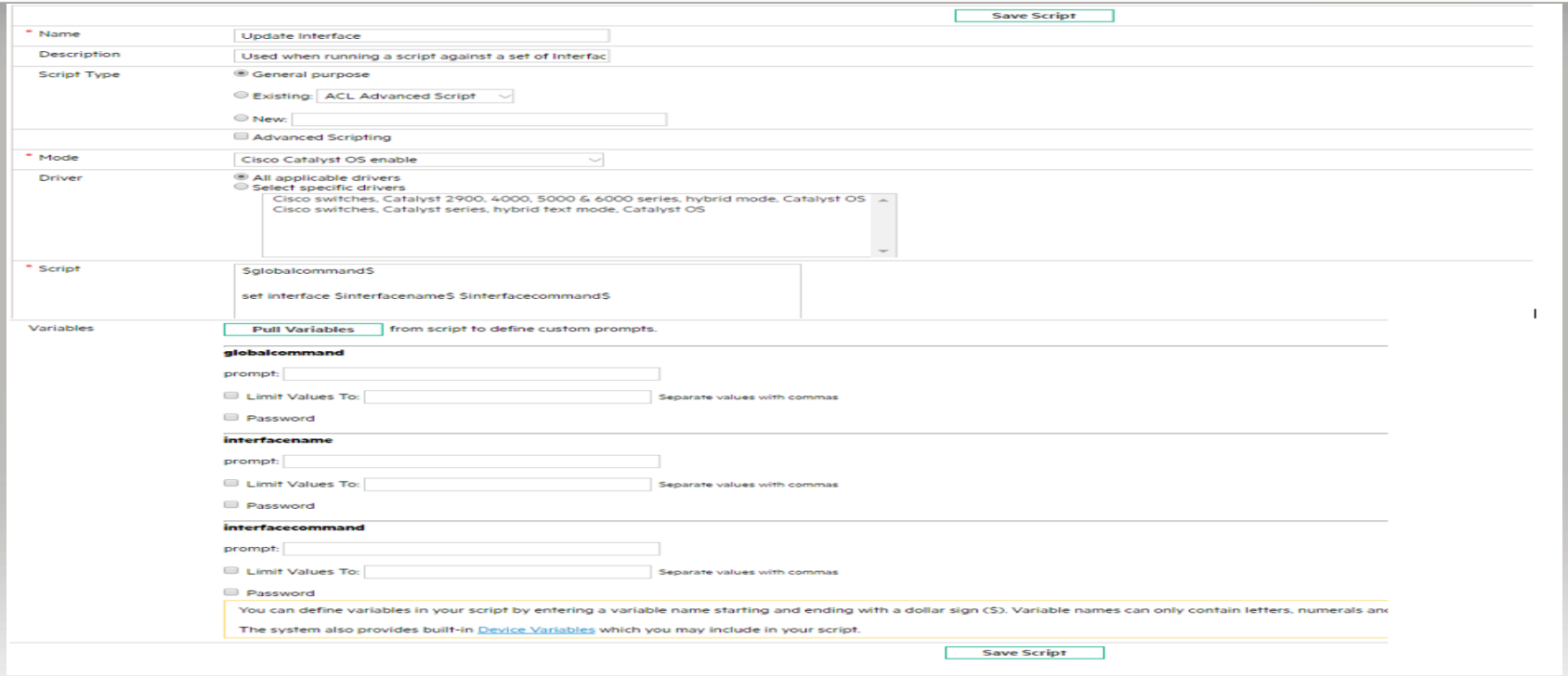
Step #5

- We have devices in NA
- Configurations and Diagnostics collected
- We created a report and saw that we didn’t find what we should have
- We were able to add a Compliance Policy and used auto-remediation to fix the issues

- Lastly we will talk about command scripts

Define a New Command Script



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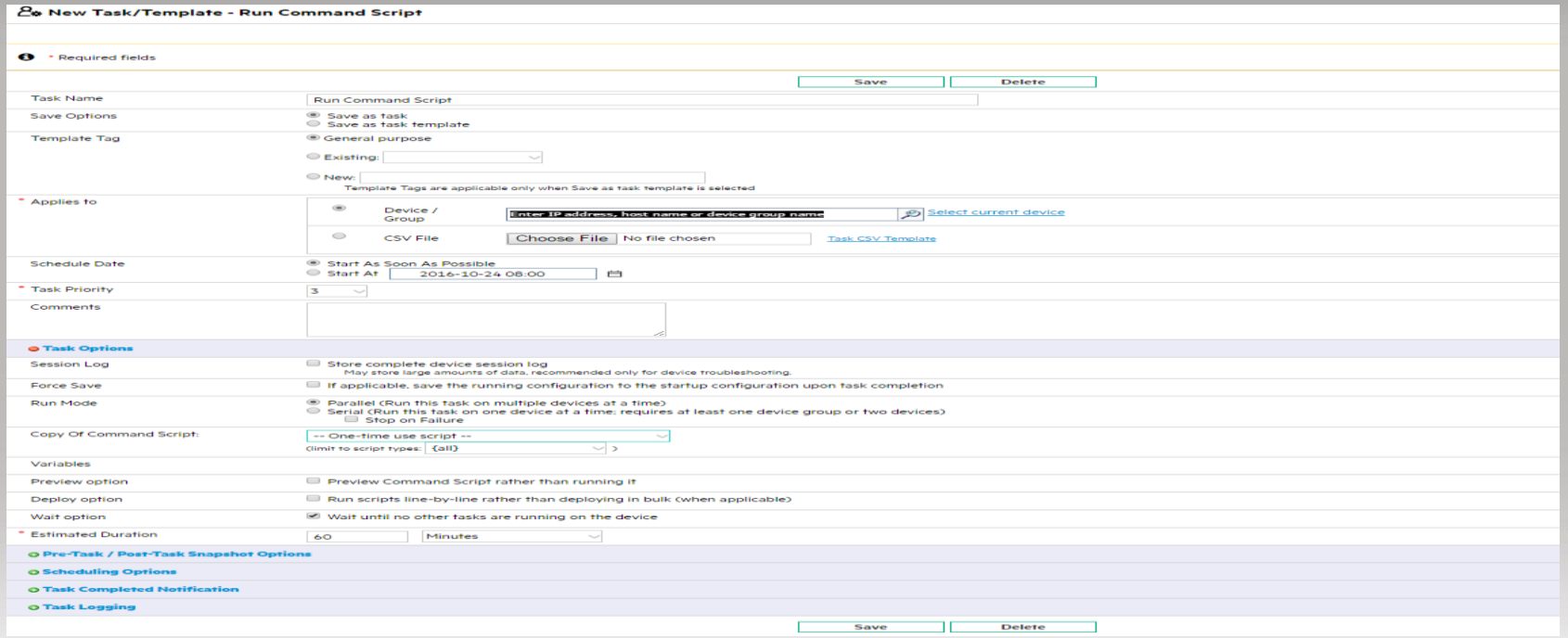
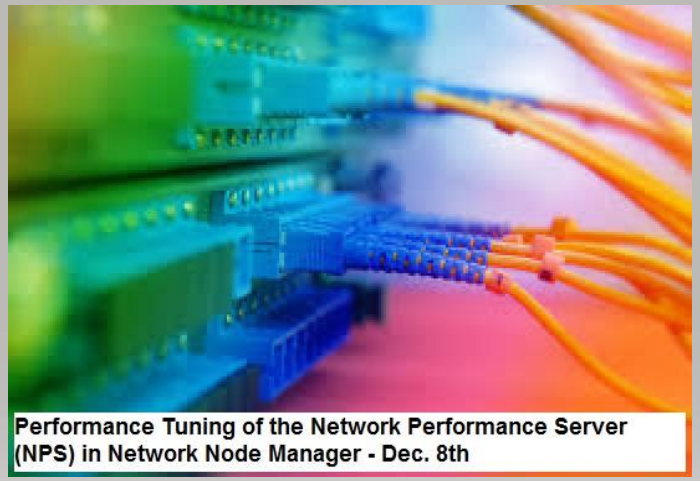
Running a Command Script



Q&A

Vivit Network Mgt SIG Webinar



Join us tomorrow (12/8/16) for another Network Mgt SIG webinar at 10:00am EST :

Performance Tuning of the Network Performance Server (NPS)

http://www.vivit-worldwide.org/events/EventDetails.aspx?id=871283&group=

Additional Resources

Available On-Demand:
Drive Value with NNMi and NA with Integrations and Automation
http://www.vivit-worldwide.org/members/group_content_view.asp?group=90989&id=584576

Join the HPE Network Management LinkedIn group

www.vivit-worldwide.org

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