

APPLICATION NOTE

Automate Meraki using Gluware
Part 2: Config Model Editor and Network RPA

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OVERVIEW

While the Meraki solution is feature-rich, the steps to configure and manage are more complicated, often requiring many clicks to navigate into network settings and device settings. As enterprises scale to hundreds or thousands of devices, the Meraki Cloud must be automated. Meraki does offer a rich Dashboard API users can leverage to enable 3rd party automation through Gluware.

Powered by API Modeling, Gluware expanded its automation capability of Meraki to enable Gluware applications to perform inventory, config drift, config audit, config management and process automation. Through integration with the Meraki REST API, and secure API keys, Gluware reads the inventory details along with all the configuration parameters available through the Meraki Dashboard. Meraki provides over 300 API calls Gluware leverages to provide automation and simplify operational tasks as enterprise users scale-out deployments. Performing a network assessment is a recommended starting point for any project that involves equipment refresh planning, lifecycle management planning, network automation or many other initiatives that change the network infrastructure. Before making changes, it is critical to have current data regarding the inventory, configuration state and operational state.

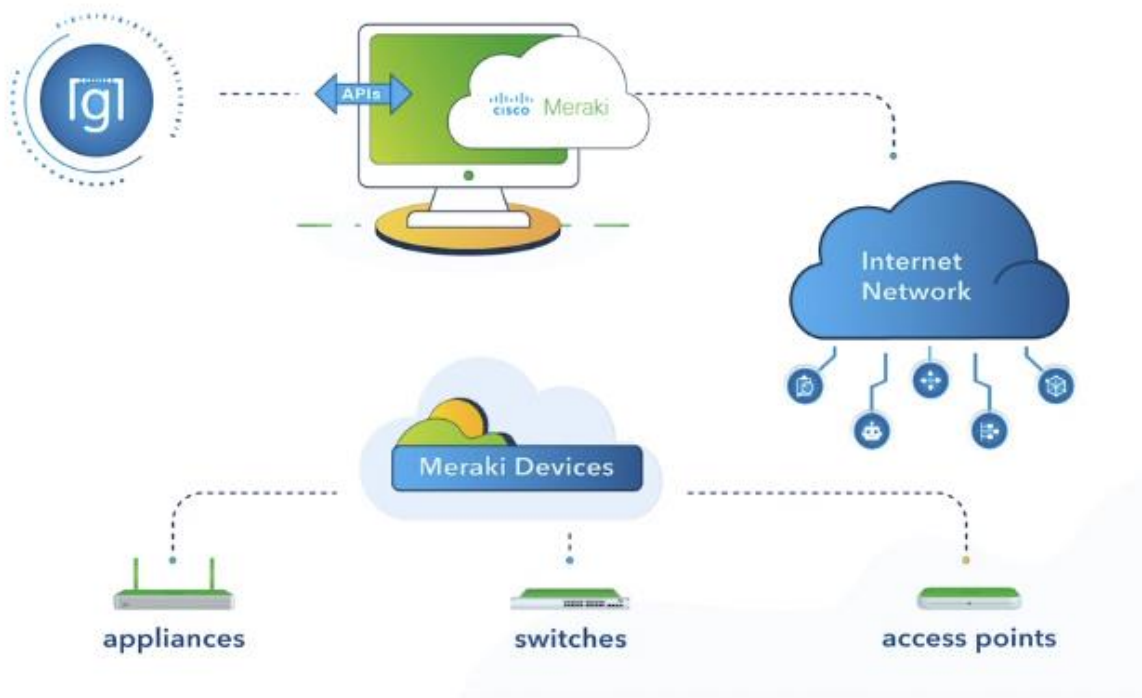


Figure 1 Gluware automating Meraki via API

Gluware provides automation through the Meraki Dashboard API using applications such as:

- **Device Manager** – View your inventory details across orgs and networks
- **Config Drift & Audit** – Identify config drift and execute no-code config audits
- **Config Model Editor** – Automate config changes across orgs, networks and devices
- **Network RPA** – Automate end-to-end processes with Gluware and 3rd party integrated tasks

Part 1 focused on the Device Manager and Config Drift & Audit applications. This app note, Part 2, dives deeper into how Gluware provides simplicity and scale to automate adding new organizations, networks, devices, VLANs, and more, enabling users to configure thousands of network devices in minutes.

GETTING STARTED

Automating Meraki with Gluware requires two steps to set up the system. First, set up the Meraki Organization by obtaining a Meraki API key, including the credential and connection. Second, set up your Gluware Organization by installing the Meraki package. For more information, see the [Meraki API Docs](#).

Start with the app note part one download [here](#).

The app note details the steps to get started including:

- In your Meraki dashboard <https://dashboard.meraki.com>
 - Create a Meraki API credential.
- In your Gluware org [http://\(your Gluware instance\)](http://(your Gluware instance))
 - Install the required packages.
 - Add the required Meraki API credentials.
 - Add the API connection information in the Device Manager application.
 - Select the Meraki Controller and execute a discovery.

Note that this app note was written using the Gluware 5.2 MR2 release.

CONFIG MODEL EDITOR

Meraki supports automating their solution via REST-based API. The Meraki API is well documented, yet automating via API typically requires a programming skill set to make the API calls (GET, POST, PUT, DELETE...) and process the output.

View the [Meraki Dashboard API documentation](#).

The Gluware Config Model Editor app provides the ability to automate configuration changes. The approach is to define the desired state, then the engine interacts with the device/controller to put it into the desired state. Gluware provides 40+ network operating system adapters. Most of the adapters are CLI based. In the Gluware 5.0 release, API Modeling was introduced to automate API based endpoints in the same way that Config Modeling is used to automate CLI. Gluware provides all the necessary API calls integrated into the solution so that no programming skills are required.

The Meraki Dashboard provides a nice UI to make configuration changes; however, when making changes across many items, like Orgs, Networks and Devices, this can become a lot of tedious point-and-click that can lead to user errors.

Use the Config Model Editor app to automate Meraki:

- ✓ Automate changes to organizations, networks, device and VLANs
- ✓ Configure thousands of networks in minutes
- ✓ Modify device settings like SVIs and VLANs including switch stacks

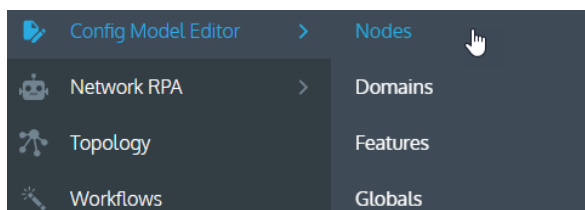
For an introduction to how Gluware automates Meraki via API, watch the tutorial video [here](#).

For a deeper tutorial on the Config Mode Editor, view app note [here](#).

Use Config Model Editor to Import then Automate Meraki Configurations

The Config Model Editor app automates the Meraki configuration using API calls to api.meraki.com. The API key used determines the Organizations that you have access to.

To get started, navigate to the Config Model Editor app, in the Nodes view. Navigate to the **Node-> Meraki Cloud Service** view. Right-click on the Meraki Controller and run the Import wizard.



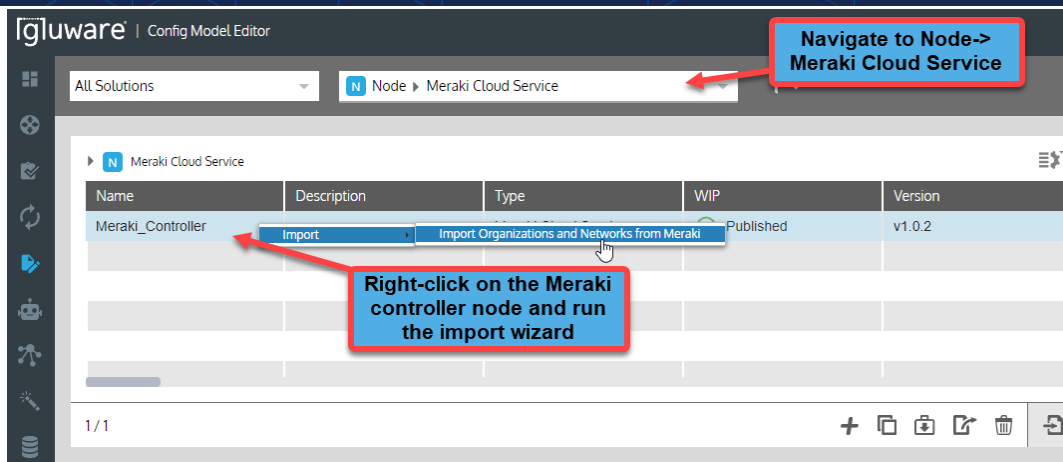


Figure 2 In the Config Model Editor, run the mport wizard

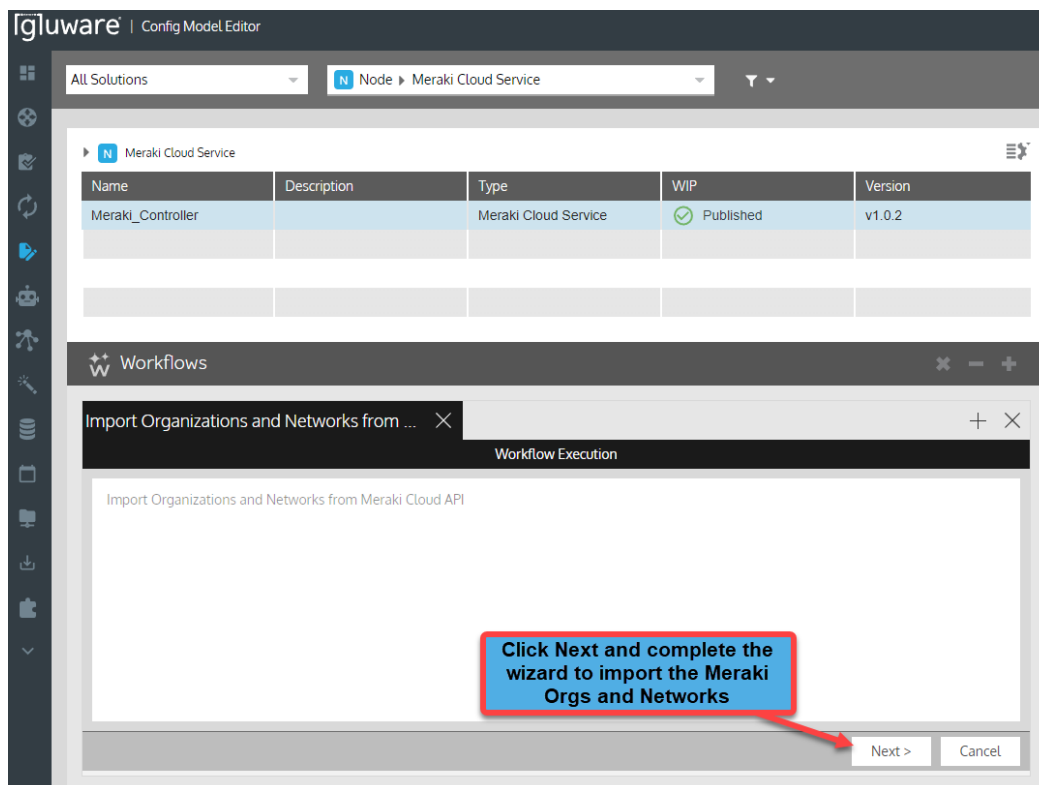


Figure 3 Complete the wizard to import your Meraki org and network configurations

Using the import wizard, select the Orgs and Networks you want to automate with Gluware. Gluware uses API calls to import the current configuration state of those items.

The screenshot displays the Gluware interface. On the left, a table lists the 'Meraki Cloud Service' instance with details: Name (Meraki_Controller), Description, Type (Meraki Cloud Service), WIP (Published), and Version (v1.0.3). Below this is the 'Node Instance Map' showing a flow: Meraki_Controller (Meraki Cloud Service) → Meraki Cloud Service Assembly (Meraki Cloud Service) → API Model Synchronizer (API Model Synchronizer) → Office LAB (meraki@huynhvan.net) (Meraki Network). A red box with an arrow points to the 'Node Instance Map' tab, with the text 'Navigate to the Node Instance Map'. On the right, the 'Instance' details for 'Meraki_Controller' are shown. The 'Associations' tab is selected, showing 'Assembly Policy' as 'Meraki Cloud Service' and 'Cloud Provider' as 'Meraki Cloud'. A red box with an arrow points to the 'Assembly Policy' field, with the text 'The Assembly Policy will be assigned to the Node'. At the bottom left, a red box with an arrow points to the 'Node Instance Map' tab, with the text 'Navigate to the Node Instance Map'.

Figure 4 Navigate to the Node Instance Map and view the assigned Assembly

Once the import wizard is complete, navigate to the Node Instance Map view, click on the Meraki Controller and the right panel opens with details about the Controller instance. In the Associations view, you can see that an Assembly policy is assigned. The goal of the Config Model Editor is to synchronize any changes you make in Gluware with the Meraki Controller.

The screenshot displays the Gluware interface. On the left, a table lists the 'API Model Synchronizer' instance with details: Name (API Model Synchronizer), Description, WIP (Published), Version (v1.0.2), and Created By (admin). Below this is the 'Node Instance Map' showing a flow: Meraki_Controller (Meraki Cloud Service) → Meraki Cloud Service Assembly (Meraki Cloud Service) → API Model Synchronizer (API Model Synchronizer) → Office LAB (meraki@huynhvan.net) (Meraki Network) → meraki@huynhvan.net (Meraki Organization). A red box with an arrow points to the 'API Model Synchronizer' node, with the text 'Select the API Model Synchronizer'. On the right, the 'Instance' details for 'API Model Synchronizer' are shown. The 'Configuration' tab is selected, showing 'Organizations Available' and 'Selected' (meraki@huynhvan.net). Below this, 'Networks Available' and 'Selected' (Office LAB (meraki@huynhvan.net)) are shown. A red box with an arrow points to the 'Configuration' tab, with the text 'The Configuration shows the Orgs and Networks that will be automated'. At the bottom right, a red box with an arrow points to the 'API Model Synchronizer' node, with the text 'Select the API Model Synchronizer'.

Figure 5 Navigate to the API Model Synchronizer to view and select the Orgs and Networks

Figure 6 Navigate to Meraki Networks to view and select the Configuration and Settings policy

This Configuration and Settings for the Meraki Networks determines what policies Gluware is automating. In this basic example, just SNMP network settings will be automated via Gluware. The rest of the configuration in the Meraki Dashboard will not be affected. Users are able to automate as much or as little as they need to using Gluware. Be sure to click **Save** on the instance settings.

Figure 7 In the SNMP Policy View, configure the Intended state of the SNMP policy

The screenshot shows the Meraki Organization view on the left and the Instance configuration page on the right. The Organization view includes a table with columns: Name, Description, WIP, Version, and Created By. The first row is 'Office LAB (meraki@huynhvan.net)' with a green checkmark in the WIP column, version v1.0.3, and created by admin. Below the table is a 'Node Instance Map' showing a flow from 'Meraki Controller' to 'Meraki Cloud Service' to 'API Model Synchronizer' to 'Office LAB (meraki@huynhvan.net)' and finally to 'meraki@huynhvan.net'. A red box with an arrow points to the 'Office LAB (meraki@huynhvan.net)' node with the text 'Select the Meraki Network'.

The Instance configuration page on the right shows the 'Configuration' tab. A red box with an arrow points to the 'Settings' tab with the text 'Use the Config view and Settings to add Settings to automate, in this case an SNMP policy'. Another red box with an arrow points to the 'Add Settings +' button with the text 'Last, click to navigate into the policy of each setting'.

Figure 8 In the Meraki Organization view, use the configuration to add settings to automate; in this case SNMP policy at the Org level

The screenshot shows the 'Instance' configuration page for 'Demo-Meraki Global SNMP Settings-1'. The 'Configuration' tab is active. The form contains the following fields:

- SNMPv2**: Enabled (dropdown)
- SNMPv2 Community String**: SNMPv2 Community String (text input)
- SNMPv3**: Disabled (dropdown)
- SNMPv3 Authentication Mode ***: SHA (dropdown)
- SNMPv3 Privacy Mode ***: AES128 (dropdown)
- IP restrictions**: (empty list with 'Add Item +' button)
- SNMPv3 Port**: SNMPv3 Port (text input)

At the bottom right, it says 'v1.0.1 Updated by admin on 1/05/24 11:59 am'. A 'Save' button is at the bottom center.

Figure 9 Use the form to configure the settings policy, in this case Org level SNMP policy

Use Config Model Editor to Provision Changes to Meraki

After completing the import wizard and using the Config Model Editor to configure the items to automate, in this case network level SNMP configuration and organization level SNMP configuration, the final step is to provision the changes. Executing a provision engages the Gluware orchestration engine to read current state of the items, compare the

intended state and then use API calls to implement changes to achieve the intended state. If target items are already in the intended state, no changes are made. This is a declarative and idempotent action.

The screenshot displays the Gluware interface. On the left, a table lists the 'Meraki Cloud Service' node with details: Name (Meraki_Controller), Description, Type (Meraki Cloud Service), WIP (Published), and Version (v1.0.3). Below this is a 'Node Instance Map' diagram showing a workflow: Meraki_Controller (Meraki Cloud Service) → Meraki Cloud Service Assembly (Meraki Cloud Service) → API Model Synchronizer (API Model Synchronizer) → Office LAB (meraki@huyinhuan.net) Meraki Network → Demo-Meraki Network (Meraki Network) → meraki@huyinhuan.net Meraki Organization. A red box labeled 'Select the Meraki Controller' points to the first node in the map.

On the right, the 'Action' view is open. A red box labeled 'Navigate to the Actions view' points to the top bar. The view shows '1 selected' item: Meraki_Controller. Below this, there are dropdown menus for 'Provisioning Utilities' and 'Provision Features'. A red box labeled 'Select Provisioning Utilities and Provision Features' points to these dropdowns. At the bottom, there are 'Schedule Action' and 'Start Action' buttons. A red box labeled 'Start the Action' points to the 'Start Action' button.

Figure 10 Select the Meraki Controller, navigate to the Action view, select Provisioning Utilities and Provision Features and Start the Action

The screenshot shows the 'Provisioning' view. At the top, a dropdown menu is set to 'Meraki_Controller'. Below it, a date range is shown: '1/4/2024 12:00 AM' to 'Now'. A 'Summary' section contains a log entry: '1/05/24 12:42 pm'. A red box labeled 'Navigate to the Provisioning view' points to the top bar. Another red box labeled 'Double-click on the log to see the details' points to the log entry.

Figure 11 Navigate to the Provisioning view, double click on the log to see the details

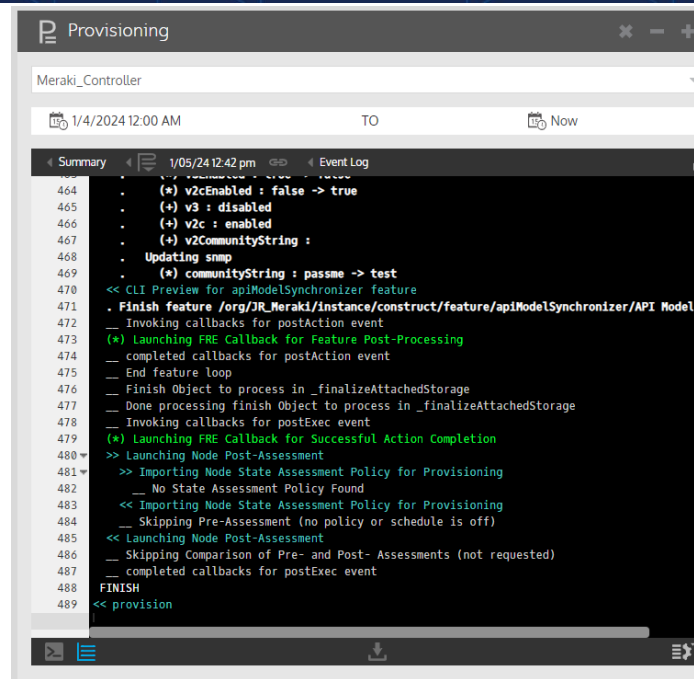


Figure 12 The log provides details of the API interactions with the Meraki API

All Solutions						
Node ▶ Meraki Cloud Service						
Meraki Cloud Service						
Features	Feature Config Status	Feature Config Summary	Feature Provisioning Status	Features Pr...	Feature...	Feature Provisioning Sum...
[g]default_merakiCloudService, API Model Synchronizer	→ (2)	→ Released	↗ (2)			↗ Provisioned

Figure 13 The grid provides a summary of the features provisioned and the status

The provisioning action completes the process to automate the changes configured in Gluware. This basic example provided the common workflow to implement Meraki organization and network changes. In this case, the changes were limited to SNMP, however users can automate as many or as few features as needed depending on the use case.

For examples of automating VLAN and SVI changes, view the video [here](#).

NETWORK RPA

Network RPA is an application in the Gluware suite that provides users with the ability to build automated end-to-end workflows using a no-code, drag-and-drop environment. One of its most powerful capabilities is that it enables orchestration of all the underlying capabilities of the Gluware application suite, which includes tasks related to inventory, drift, audit, config modeling and more. The goal of using Network RPA is to automate building workflows for common, repeated operational tasks and activities. Network RPA workflows are also used when use cases require integration with 3rd party systems beyond the network layer, like the ServiceNow ITSM or a monitoring/observability platform for example.

Build Network RPA Workflows to automate Meraki:

- ✓ Inventory automation
- ✓ Config drift and audit with optional remediation
- ✓ Configuration changes
- ✓ Add new Meraki devices

For an introduction to Network RPA, view the video [here](#).

For an example of how to automate Meraki using Network RPA with 3rd party integration like ServiceNow, view the video [here](#).

Build Network RPA Workflows to Automate Meraki

Many examples exist of using Gluware Network RPA to perform automation of the application suite capabilities. Additionally, Gluware delivers a set of tasks specific to Meraki for the use case of adding new Meraki devices to an organization, network and perform the device configuration.

For a video tutorial of this use case to add Meraki devices, view the video [here](#).

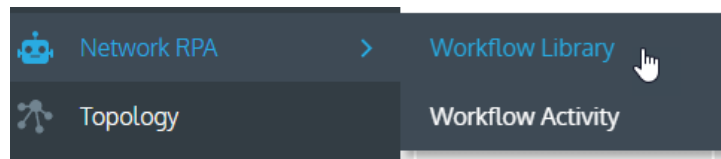


Figure 14 Navigate Into the workflow Library view of the Network RPA app

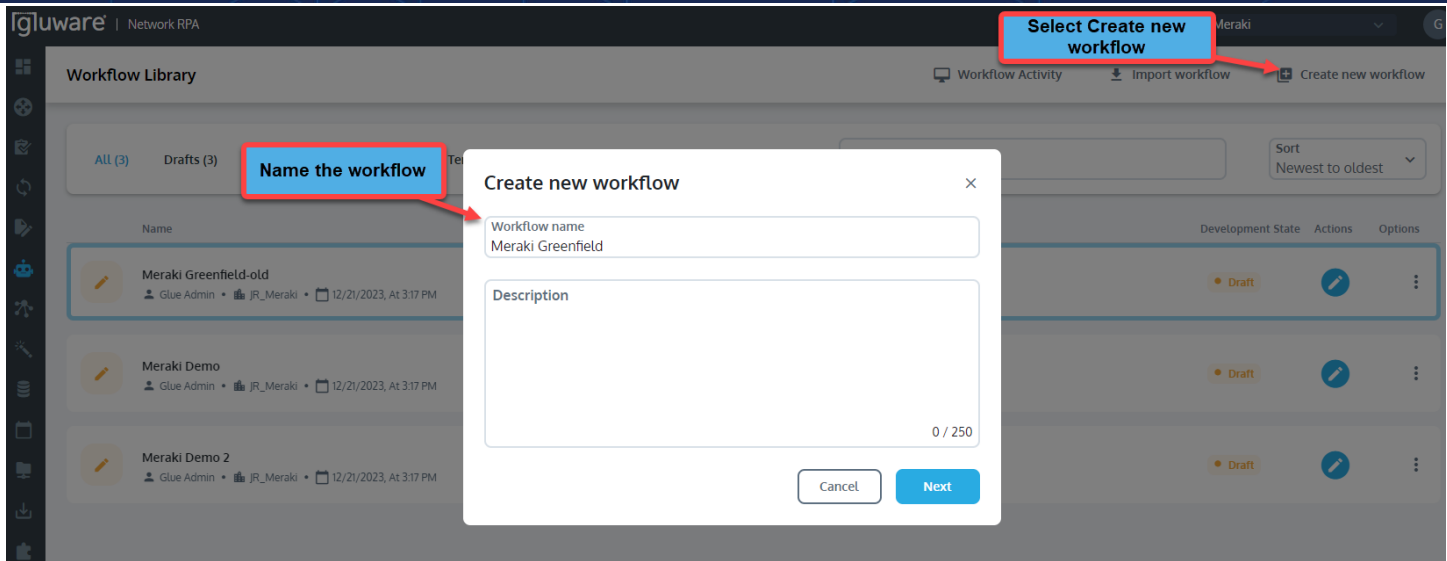


Figure 15 In the Workflow Library Create a new workflow and name It

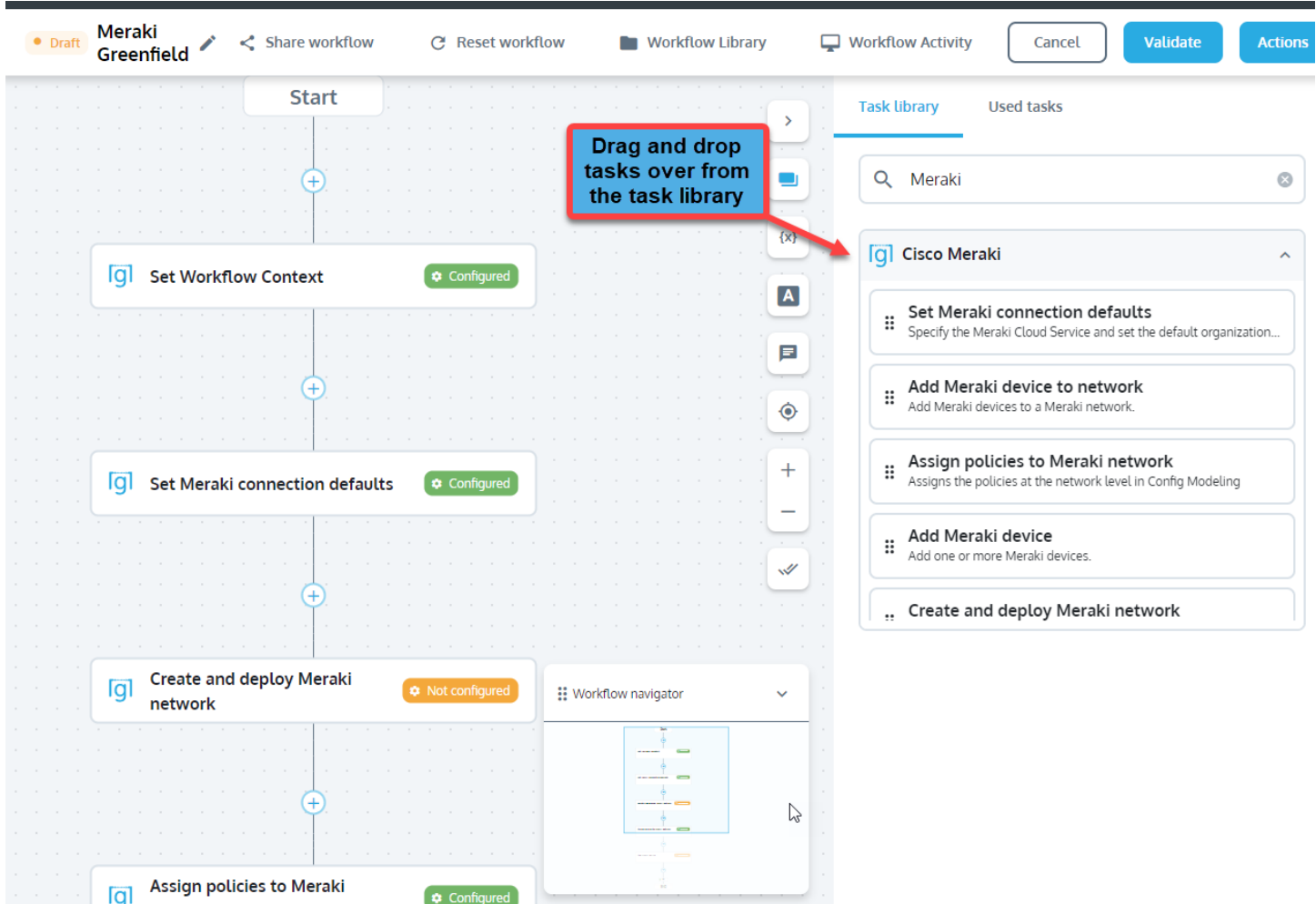


Figure 16 Use the Editor to drag and drop the required tasks Into the workflow

The tasks required are:

- Set Workflow Context
- Set Meraki connection defaults
- Create and deploy Meraki network
- Assign policies to Meraki network
- Add Meraki device
- Add Meraki device to network
- Claim Meraki device
- Remove workflow context data

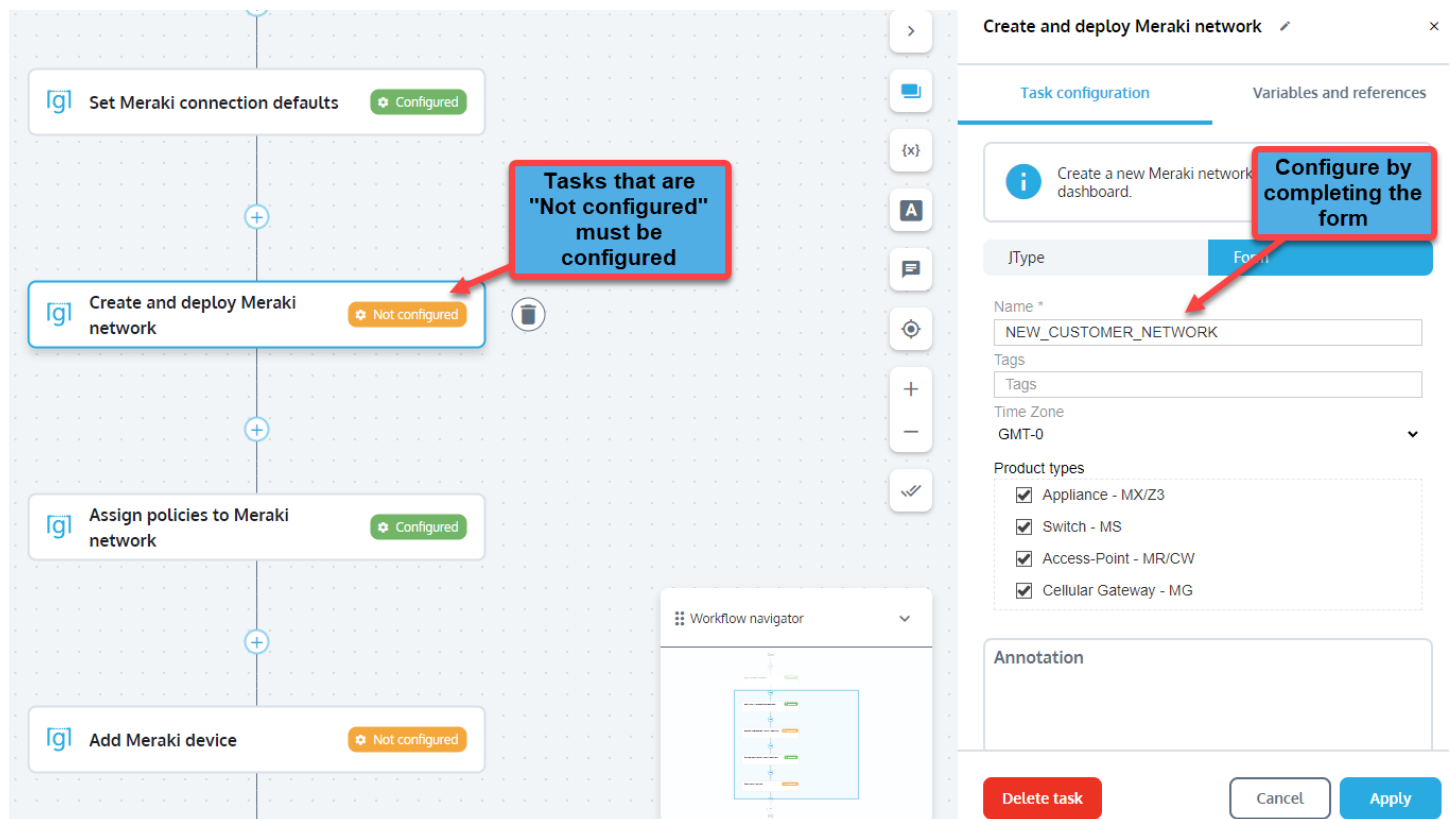


Figure 17 Click on each tasks that Is Not configured" and complete the configuration form

Complete the configuration of the tasks. This requires a valid serial number(s) for the "Add Meraki device" task.

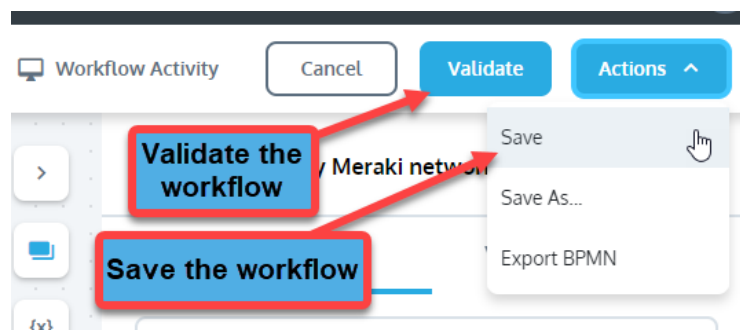


Figure 18 Click on each tasks that Is Not configured" and complete the configuration form

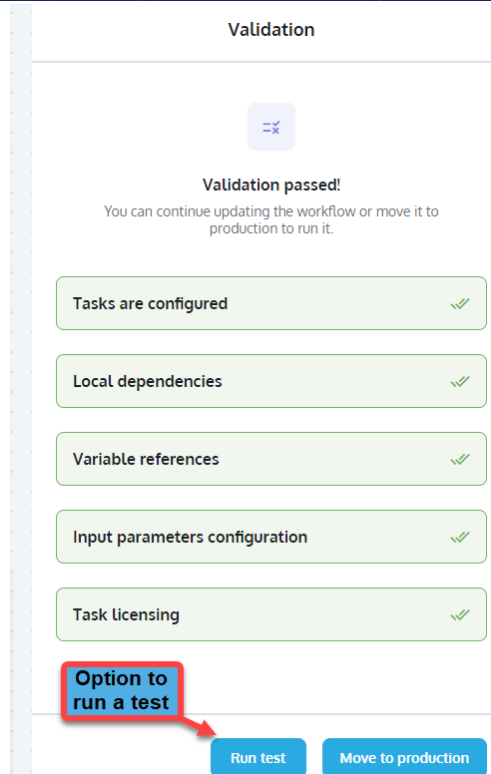


Figure 19 Click Once the workflow has been validated and saved you have the option to run a test

Note that running a test runs the workflow and, in this case, adds the Meraki network and device(s) to that organization and network. If you are in a testing environment that may be the desired next step. Once the workflow is built, it can always be run from the Workflow Library.

Network RPA is designed to have progression similar to a CI/CD process where the workflows move from draft to test and production. Once a workflow is moved to production, it cannot be edited. If changes are needed, you must clone and edit it.

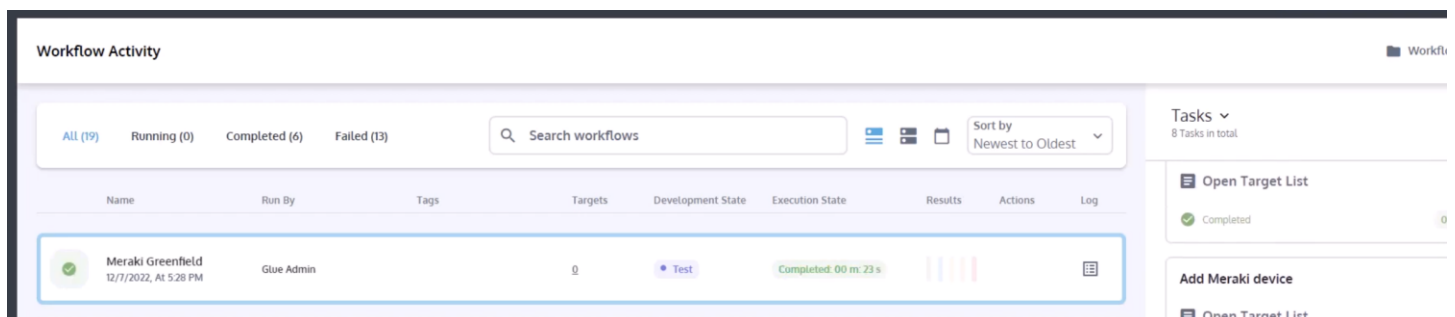


Figure 20 Navigate to the Workflow Activity to see the status of the workflow and view detailed logs

While testing, users typically navigate to the Meraki Dashboard and confirm the changes.

CONCLUSION

While the Meraki Dashboard is easy to navigate and provides intuitive form-fill configuration pages, the difficulty comes when users make errors, creating inconsistency in the configuration. As shown in part two of this application note series, Gluware Config Model Editor provides the ability to automate organization, network and device configurations and Network RPA provides the ability to build automated workflows including Meraki specific tasks to add networks and devices for greenfield deployments.

Additional Gluware Resources

[Watch a tutorial of how Gluware automates Meraki via API](#)

[Watch a demo of Gluware Automating Meraki Network Settings](#)

[Watch a demo of Gluware Automating Meraki Device IP Helpers](#)

[Watch a demo of Gluware Automating Meraki and ServiceNow](#)

[Watch a demo of Gluware Automating Meraki Deployments using Network RPA](#)

[Watch a demo of Gluware Automating Meraki Switch Stacks, SVIs, and VLANs](#)

