

Using **Intelligent Model Discovery** to Create Network Automation Policy

Application Note

Contents

Overview	. 3
Prerequisites	. 4
Gluware Config Modeling Kit (CMK)	. 4
Gluware Feature Binders	. 4
Create Model Instances Using Intelligent Model Discovery	. 5
Run from Model Editor	. 6
View the Models Created	. 8
Optional Step to Create a Feature Binder	. 9
Conclusion	. 9
Additional Gluware Resources1	0

Overview

The Gluware[®] Config Modeling app is used to build and customize your configuration policy, then use the declarative engine to deploy policies reliability at scale. This Application Note is designed to help you understand the approach of using the Gluware[®] Config Modeling application to automate network features applying the Intelligent Model Discovery workflow to rapidly create network automation policy.

To onboard your network policy there are three options:

- Intelligent Model Discovery (IMD) Workflow This Gluware workflow provides the ability to connect to a live device, read each of the configured features, then enable the creation of the required constructs in Config Modeling so that they can be used on any other device with the same operating system.
- **Network Feature Design** Is a workflow option that steps a user through the process to define and create the configuration feature.
- Example solution package One of the most common ways in which users start with Config Modeling is to use example packages provided by Gluware. These packages have commonly configured features and users can customize them to their specific configurations.

This Application Note will walk you through the process of using the IMD workflow to onboard your network policy for use in Config Modeling.

Prerequisites

To use the IMD workflow, the following prerequisites must be met:

- Your Gluware software instance must be installed (on-premises, or running from the cloud with the Gluware Secure Gateway) and enabled with licenses for the Config Modeling app
- Your network device(s) must be added via the Device Manager application, or directly in the Config Modeling application
- You must be using a network device with a Gluware supported operating system
- You must have the Gluware Config Modeling Kit (CMK) for that operating system installed in your organization
- The required Feature Binders must exist in the Model Editor (or be created)

Gluware Config Modeling Kit (CMK)

To verify you have the current CMK installed for the vendor operating system you are working with, follow these steps:

1. Navigate to Solutions Management. *(Figure 1)*



Figure 1 Select Solutions Management from the App Selector menu.

2. Using Package Explorer, click on the Installed view, and verify the Config Modeling Kit is up to date for the OS, if not, update the package. This example is using Cisco IOS Router CMK. (Figure 2)

Installed Available Import Package	
🔹 Liter Rolazian	^
Config Diffusecracity	per installed; (10.12.2090/790929 is analable)
Config Modeling Foundations assessment cases	(10.66.2000077397 to investing) (10.66.2009079440 to available)
Contrg Modeling Kit for Arista EOS Switch science domator General ⁶⁵	Sup to date!
Contrg Modeling Kit for Osco ASA Firewall Jauner Denotion Center ^B	Sup to date(
Config Modeling Kit for Cisco KOS Roubler stander Danager Creater	Ly Sup to dawy
Config Modeling Kit for Cisco IOS Switch assessment over ^B	(1.0.45.202002007923 o motolect) (1.0.45.20202082047 o motolect)
😵 Contig Modeling Kit for Osco NV-OS Switch stand destance Center 🖉	5.0° 00 dittel

Figure 2 Navigate In Package Explorer, validate the CMK is up to date for the vendor OS.

Gluware Feature Binders

To view the Feature Binders defined in your system, follow these steps:

1. Navigate to the Config Modeling app in the Model Editor. (*Figure 3*)



Figure 3 Navigate into the config Modeling app in Model Editor from the App Selector

 In the Model Editor, navigate to the Globals (G) view, select Feature Binder from the drop-down filter, and optionally, add a filter for the OS you are using, in this case IOS. (*Figure 4*)

Figure 4 View the Feature Binders using the Globals view with the Feature Binder Filter and optional additional filter for the OS name.

The existing Feature Binders will be used by IMD to identify and import those features as policy into Config Modeling. If a Feature Binder does not exist for a feature you want to import, it will need to be created before running the IMD workflow. Steps to create a Feature Binder are described in this document.

Create model instances using Intelligent Model Discovery

You can create all the instances required for Config Modeling from a device with a known configuration. The Intelligent Model Discovery (IMD) workflow will create the required Gluware components including the CLI Command Lists, CLI Command Groups, Features, and Assemblies from the device's existing configuration if they do not already exist. You can then use these instances to model other devices in your network.

You can run the Intelligent Model Discovery workflow from **Model Editor** and from **Workflows.**

Run from Model Editor

 Go to Model Editor and click N (Nodes) at the top of the screen. Also select the type of nodes to filter for, in this case IOS Routers. (*Figure 5*)

 You can launch the Intelligent Model Discovery workflow by right-clicking on the node in the grid and selecting Design-> Intelligent Model Discovery, or if you bring up the Node Instance Map, you can right-click on the icon for the target node, in this case the node is called POD-2-SPOKE-1. (Figures 6 and 7)

lgluv	vare Model Editor			
٥		IOS Router		- T -
8	IOS Router			
- *	Name	🔺 Туре	Assembly Policy	WIP
	POD-2-HUB-1	IOS Router		Published
	POD-2-HUB-2	IOS Router		Published
	POD-2-SPOKE-1	IOS Router		Published
	POD-2-SPOKE-2	IOS Router		Published
	POD-2-SPOKE-3	IOS Router		Published
	POD-2-SPOKE-4	IOS Router		Published

Figure 5 Select the Node view and use the filter for the device OS.

•	IOS Router			
Nam	ne 🔺	Туре	A	Assembly Policy
N	POD-2-HUB-1	IOS Router		
N	POD-2-HUB-2	IOS Router		
N	POD-2-SPOKF-1	IOS Router	Lata II and	
N	POD-2-SPUKE-Z		Intelligent	Model Discovery
	POD-2-SPOKE-3	IOS Router		
M	POD-2-SPOKE-4	IOS Router		

Figure 6 Run the IMD workflow by right-clicking on the target node.

Node Ins	tance Map		
POD-2-S <i>IOS R</i> vt0.4 (t	POKE-1 outer ^{A0.3)} Design	Intelligent	Model Discovery
P			

Figure 7 Another option is to run IMD by right-clicking on the node icon in the Node Instance Map view.

 Next, use Intelligent Model Discovery to step through the process for Gluware to connect to the device and parse the configuration into the instances required for modeling. The discovered models are then displayed. Read the information about the workflow and click Next. (*Figure 8*)



Figure 8 Read the information about the IMD workflow and click Next.

 Once the IMD workflow has run, use the feature tabs to brows the features discovered and the corresponding CLI feature policy. (*Figure 9*)

😽 Workflows	× - +
ntelligent Model Discovery $ imes$	+ ×
Workflow Execution - Feature Medal Creation	
Decommendantiana destructura de la constructura de	۲ ک Add Item +
<8a	Next > Cancel

Figure 9 Brows the features discovered and CLI policy.

- 5. Modeling configurations for each model discovered: (*Figure 10*)
 - If you want to restrict the CLI commands allowed, click Add Item +, select Allowed CLI Commands (regex), and enter the CLI commands. If no commands are entered, Gluware will allow any command to be issued.
 - If you want to render the commands only if the listed elements are found during discovery, click Add filter +, select Discovery Elements, and list them.
 - Clear the **Save Model** box if you do not want to model the feature.
- 6. Confirm the features you want to build by checking the box next to the feature name and click **OK.** (*Figure 11*)

Workflows			
Intelligent Model Discovery $ imes$			
	AAA Feature		
	Banner Feature		
	DMVPN Feature		
	DNS Feature		
] Nac Feature		
	Netflow Feature		
	 NTP Feature		
	QOS Feature		
			Cancel OK

Figure 11 Confirm features you want Gluware to build and click OK.



Figure 10 Customize the feature by changing the Naming Convention used for discovery or adding a CLI filter. Save changes and click Next.

 Click Finish (or Cancel if you do not want Gluware to build the models). Once the Workflow Progress is complete you will see the message "Workflow has completed.", close the workflow and return to the model editor. (Figure 12)

Workflows	x - +
Intelligent Model Discovery $ imes$	+ ×
Wantlow Execution - Confirmation	
Select Finish to build the models or Cancel to abort with no instances created.	
Once Finish is selected, all the selected feature models will be created.	
A system feature set TMD (Created) FeatureSet: can be accessed using Network Feature Design wizard.	
	<back cancel<="" finish="" td=""></back>

Figure 12 Finish the workflow, then after completed, exit the workflow to return to the Model Editor view.

View the Models Created

 Once the IMD workflow is completed, in Model Editor on the Nodes(N) view click on the node that IMD was run on and bring up the **Node Instance Map.** From this view, you can see and navigate all the Gluware constructs created including the Assembly, Features, CLI Command Groups and CLI Command Lists. (*Figure 13*)

luware Model Editor					
ە 📦 💿 🖗 🔇	IOS Router	<u>~</u> т.			
> 🍵 IOS Router					
Name	Type Assembly Policy	WIP	Version	Created By	Greated On
POD-2-HUB-1	IOS Router	Published	v1.0.0	mhaugh	12/21/20 10:15
POD-2-HUB-2	IOS Router	Published	v1.0.0	mhaugh	12/21/20 10:15
POD-2-SPOKE-1	IOS Router IosRouter_161315979661	3 🗹 Published	v1.0.5	mhaugh	12/21/20 10:15
POD-2-SPOKE-2	IOS Router	Published	vl.0.4	mhaugh	12/21/20 10:15
1/4				_	
Roderinstan	been top	barner_clicip_k0E37840394	Earner_cl_M038597566033859	KS farrer	105_Barner_cilifetadata
	Eartheart Particle Particle	en citre atternation	Designer di Mittighternatio	KOS Decisional	
	0m1(15)977M450 URL Hatter	and Common Streep	- Continuential OP ///	Circupt See	
		np_clop_statisticat	MpAgere_ci_MettishMeettaktit	Constant	
	143_100557776403	96	ClassMap(3b00597/We399/of CLICommentCet	ICS CaseMap Conception	KG_Cuestings_contention
		906_0009_0000979660007	PolicyMap_di_Md3597796403329e	KOS, Petrophap Conception	KS, PARQMap, d.Metadata
terrar a	qes005 feasive	405_0.0p_10175979441099			
PC0-2-SPCH2-1 ACS Render	Accenting - ACC Rover	C) Comment Group	RACI_CI_10035977964138Ha CL/Convention	IOS IpAci Consider	KOS_JoAct_cEMetadata C2/Metadata
	Security Michael Storing Pattore	Sound Toria and Automatican			
	snmp_la00(59794423	search_d.Grg_303597966369	InstcliMERS#7964Elector CLi Communication	Concege Aun	
	nation MCRAPHONES	swip_citing_stitis97%483.45	Svmp_di_M3597Ned38e02 CJ Commerciat	Conceptum	
	"Bottop faithers	systegd.Grpte315979643031	SydagServer_di_MDS9796483294	KOS, SystagServer	
	Internation MIDISTINUS				
	I FORTUNE VIDATIVAL				

Figure 13 In Model Editor, click on the node IMD was run on and bring up the Node Instance Map view to see all the Gluware constructs created.

2. Now you are ready to use the Model Editor to view and edit any of the polices and apply the changes to this node or assign this same assemblies (or any of the feature created) to additional nodes to automate policy on them. Each item created is now available in the related Domain, Features and Globals view, like this Banner Global CLI Command List created. (Figure 14)

lglu	ware Model Editor				Test
6	CLI Command List	~ т •			
٩,	CLI Command List		IX A	🚯 Instance	
3	Name Description Banner_cli_16/3/597966/37859	WIP Published	Version Co VL0.0	infiguration Attached Storage	
L	ClassMapcli161315979661397df	Published	VI.0.0	Banner_cli_16131597966137859	
	intf_cli_1613159796613ebb1	Published	vl.0.0	Associated Concept Item * IOS_Banner	
	र e e Node Instance Map	any may be a first and the second secon	X - +	CLOBINGS bases bagin *C www.mostleam.com row.	
l			10000000		1
L				Sove	
	And Transformers	المنتخبين المنت المنتخبين المنتخبين المن المنتخبين المنتخبين المن المن المنتخبين المنتخبين المنتخبين المنتخبين المنتخبين المنا المن المن المنا المن المنا المن المن	Constant		

Figure 14 Browse individual constructs created using the Node Instance Map or the Grid view at the top.

Optional Step to Create a Feature Binder

A Feature Binder is a collection of Concept Items. A Feature Binder is required if you want to use IMD:

- 1. In Model Editor, click G (Globals) at the top of the screen.
- 2. Select Feature Binder from the drop-down list.
- 3. Click 🕇
- 4. In the Instance panel, click $^{\circ}$ and name and describe the Feature Binder instance.
- 5. Select the device vendor from the drop-down list.
- 6. Select the operating system from the drop-down list.
- 7. Give the Feature Binder its internal name. The name cannot contain spaces or special characters.
- 8. Give the Feature Binder a display name.
- 9. Click Add Concept Item + and select a Concept Item from the list.
- 10. Add one or more additional Concept Items.

11.Save.

Conclusion

This *Application Note* was intended to provide a base knowledge for the execution of the IMD embedded workflow which is used to import feature and polices from existing devices in your network to create automaton policy.

Using IMD will accelerate the process to get started building your custom policies, but then additional work will be needed to customize them, add variables, conditionals and constraints. Use Gluware Config Modeling to model network features to standardize configurations across your network devices, eliminate manual errors and configuration bloat.

If you are ready to get started with Gluware system for automation or testing, here are some options:

- 1. **Get started with Gluware** from our free SaaS Network Inventory app offer to Gluware Enterprise for larger networks. Visit **Gluware Pricing Page** to learn more.
- Kick the tires using a virtual environment we setup for you by requesting a Test Drive. Learn more here.
- 3. **Connect with a network automation expert** to explore your unique network needs, ask questions and request a tailored demo here.

Additional Gluware Resources

Watch a **demo** of Intelligent Model Discovery.

iutoriais Collaterai Webinars Biogip	posts
--	-------



2020 L Street, Suite 130 Sacramento, CA 95811

www.gluware.com

© 2021 Gluware, Inc. Gluware is a registered trademark of Gluware. Inc. Other names and brands are the property of their respective owners.