



CHAPTER 1

Cisco Prime Network Activation Customization Concepts

The following topics provide an overview to the Cisco Prime Network Service Activation customization concepts and processes:

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Network Activation Customization Elements

Network Activation customizations are performed on three file types:

- **Wizards**—XML files that contain the activation attributes and control display and behavior of the activation wizards launched from Prime Network Vision.
- **Workflows**—XML files created with Prime Network Workflow that control the activation flow on the network devices identified in the activation wizards.
- **Scripts**—BeanShell files containing the Telnet and CLI sequence to complete activations at devices identified in the activation wizards at the direction of the activation workflows.

Customizing these files requires different approaches and tools. To customize a wizard, you have a choice:

- Use the Activation Modification Utility (AMU) of Network Activation, located on the Prime Network Vision Activation menu, to download the wizard metadata files from the gateway to a local drive, edit them with an XML or text editor, then upload them to the gateway. Simple changes, such as changing an attribute display name or removing an attribute, can be accomplished in minutes. More complex customizations take longer and require more planning.
- Use the Prime Network Activation Wizard Builder (AWB) to customize the wizard metadata files. Prime Network AWB provides a GUI that makes wizard metadata changes easier to implement and view. Prime Network AWB also performs metadata validation, and handles the file downloading and

uploading. In general, Prime Network AWB is the preferred method for customizing Network Activation wizards. However, it is useful to know how to download, edit, and upload wizard metadata files using AMU, in certain situations.

To perform customization in Network Activation you must have administrator or configurator level permissions. To customize a workflow, open Prime Network Workflow and download the files using the Prime Network Workflow download function. You must use Prime Network Workflow to perform all activation workflow customizations. When completed, you can upload the workflows using the Prime Network Workflow upload function. Customizing workflows requires familiarity with the

- Prime Network Workflow
- Programming logic
- Knowledge of the workflow activation objective

Script customization requires knowledge of BeanShell and scripting, as well as knowledge of the CLI sequence at the device level. To customize scripts, use the Prime Network Command Builder. Command Builder is described in the *Cisco Prime Network 3.8 Customization User Guide*. However, script customization is not recommended unless you have knowledge and experience in these areas.

Activation Wizard Files

Activation wizards include the following files and file types:

- **Service.xml**—Defines the Activation window activation tree that appears after the operator launches the Activations menu item in Prime Network Vision. The file defines the tree sequence and display names. It also links tree items to the appropriate pages and activation files that will be invoked when the operator chooses an item from the Activation tree. Only one Service.xml file is in effect at any given time.
- **Pages files**—Define the wizard pages display and behavior in Prime Network Vision GUI.
- **Activation files**—Contain the attribute values collected by the pages file. Activation files provide the attribute inputs entered by operators to the activation workflows.
- **Macro files**—Contain subroutines called by pages files to perform short, directed actions such as retrieving a list of devices to populate the Device attribute or retrieving a list of device interfaces.

Pages and activation files function in pairs. One controls the wizard content and behavior; the other maps the collected wizard inputs to the workflow inputs.



Note

The pages and activation files provided in the delivered Network Activation package contain the word “Pages” and “Activation” in their file names to make file tracking easier. This practice is not required, but is recommended.

Activation Workflows

Activation workflows take the attribute inputs collected by the wizards and guide the activations and device provisioning sequences. A workflow is comprised of tasks arranged in a hierarchy or other logical sequence. Workflows run the logical flow of activation commands, including rollback scenarios. The workflow author defines relationships between tasks, including sequences, branches, and failure procedures. To customize activation workflows, you use the Prime Network Workflow, which is described in the *Cisco Prime Network 3.8 Customization User Guide*.

Activation Scripts

Activation scripts contain the CLI sequence, including Telnet commands, to activate activations or create elements on devices following the workflow tasks and with the attribute inputs provided by operators in the activation wizards. Scripts can be modified, but customization requires familiarity with BeanShell and/or the Prime Network Macro Language. The Prime Network Macro Language is described in the *Cisco Prime Network 3.8 Customization Guide*. BeanShell is a small, free, embeddable Java source interpreter with object scripting language features. BeanShell is written in Java. It dynamically executes standard Java syntax and extends it with common scripting conveniences such as loose types, commands, and method closures like those in Perl and JavaScript. (The most complete resource for using BeanShell scripting language is available at <http://www.beanshell.org/>.)

Although script customization is possible, keep in mind that the activation scripts provided with Network Activation were designed and tested against with Network Activation wizards and workflows.

The activation scripts of Network Activation are located in:

`$NETWORKHOME/Main/scripts/configuration/cisco/ce` Over 130 scripts are provided with Network Activation. Scripts are divided into groups based on the key action the script performs:

- Activate
- Add
- Configure
- Create
- Modify
- Remove

The activation workflows of Network Activation call anywhere from four to six scripts to perform specific functions at different points in the workflow process.

Activation Flow

The Network Activation wizards, workflows, and scripts work together to facilitate device provisioning and activations. [Table 1-1](#) shows the general flow.

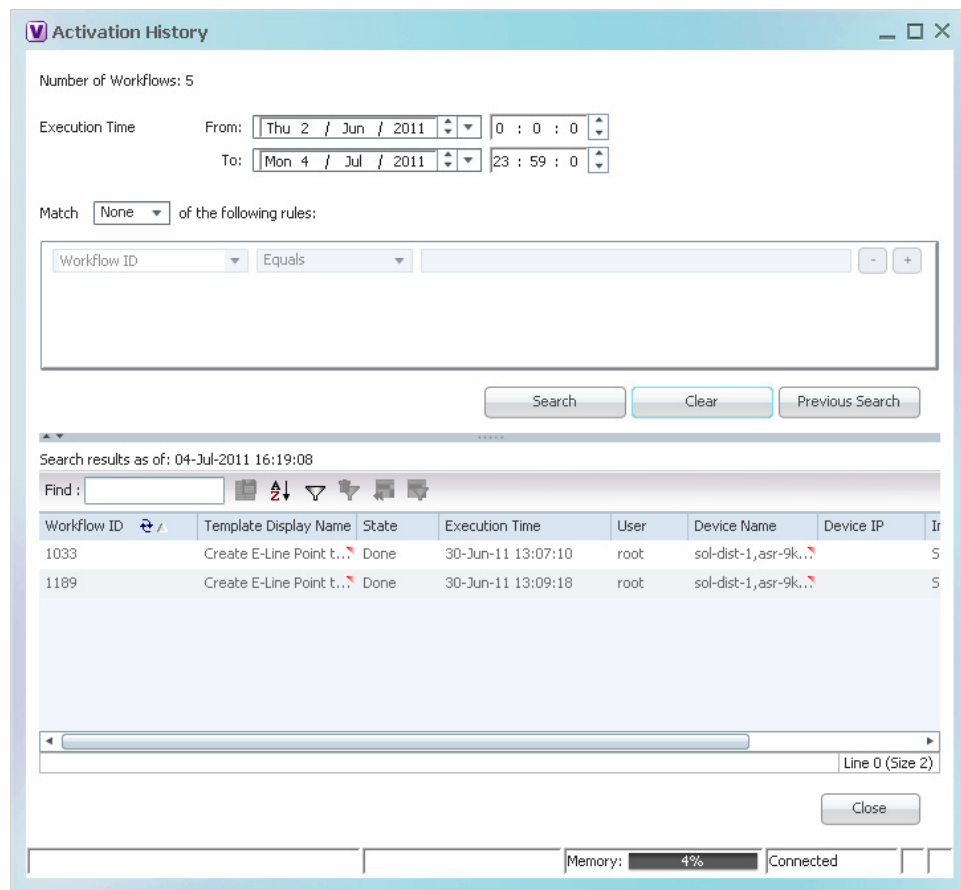
Table 1-1 Network Activation Process

Action	Files Involved	File Type
From the Activation menu in Cisco Prime Network Vision, operator chooses Activation.	Service.xml	Wizard
Operator expands the Activation tree and chooses an activation. The pages and activation files for the activation selected by the operator display the activation wizard.	Service.xml >>> <ul style="list-style-type: none"> • [activation name]Pages.xml • [activation name]Activation.xml 	Wizard
Operator enters activation data.	[activation name]Pages.xml	Wizard
Operator completes the wizard.	[activation name]Pages.xml [activation name]Activation.xml	Wizard

Table 1-1 Network Activation Process (continued)

Action	Files Involved	File Type
After completing all attributes, operator clicks Finish.	[<i>activation name</i>]Activation.xml [<i>activation name</i>] Workflow	Wizard Workflow
The activation workflow completes its tasks. It calls activation scripts to perform specific functions.	[<i>activation name</i>] Workflow [<i>function</i>] scripts	Workflow Script
The workflow receives success/failure input from devices. Based on that input, the workflow performs completion or rollback tasks.	[<i>activation name</i>] Workflow [<i>function</i>] scripts	Workflow Script
The workflow output is sent to the Activation History menu in Network Activation. The operator can view the results and view the workflow output (Figure 1-1).	[<i>activation name</i>] Workflow	Workflow

Users can search for the activation details of completed workflows. Upon completion of the activation process, operators view results in the Activation History window. Depending on the results, the operator can start again, or begin a new activation.

Figure 1-1 Activation History Window

The number of activations displayed in the search results of Activation History window is set in the Prime Network registry `cvm.xml` with `key="service-activation-list"` and `entry="retrieval-block-size"`. The current default is 5000 for the activations that are deployed latest. You can change the value of this setting using the `runRegTool` command, which is located in `NETWORKHOME/Main`.

**Caution**

Before you change the Prime Network registry, review “Working with the Registry,” in the *Cisco Prime Network 3.8 Administrator Guide*.

The maximum number of activations that can be displayed is 5,00,000. Keep in mind, a trade-off exists between the number of activations displayed and performance. The higher the number of activations displayed, the longer it will take for the Activation History window to populate.

To change the Activation History activation results display:

Step 1 Change to the Main directory:

```
% cd Main
```

Step 2 Using the `runRegTools` command, set the new activations display:

```
% ./runRegTool.sh -gs 127.0.0.1 set 0.0.0.0 cvm/management/workflow/searchResultMaxRawSize new-number
```

For example:

```
./runRegTool.sh -gs 127.0.0.1 set 0.0.0.0 cvm/management/workflow/searchResultMaxRawSize  
10000
```

Step 3 Run the `clientregpacker.sh` using:

```
~/Main/scripts/clientregpacker.sh
```

Step 4 Restart Prime Network Vision.

For more information about viewing activation results, see the [Cisco Prime Network Activation 3.8 User Guide](#).

Network Activation Design Principles

Network Activation wizards, workflows, and scripts were developed using the following design principles that you should consider when customizing Network Activation. Failure to follow these principles in your customization might cause inefficient or incomplete activations.

Network Activation scripts follow two key principles:

- Error handling—Scripts must anticipate errors and provide for adequate recovery sequences at all script levels.
- Atomic design—Script development or customization should be as atomic as possible. That is, if any script sequence fails, the entire operation should fail; all devices must be restored to the state they were in before the script operation began.

Similar design principles apply to Network Activation workflows:

- Exception handling—Workflows must anticipate and adequately account for exception occurrences.
- Rollback (best effort)—Workflows must rollback all completed operations whenever exceptions occur before the entire workflow is completed. For example, if a workflow completes activations on multiple devices, and an exception occurs on the last device, all completed device activations must be rolled back to ensure device consistency.
- Activation removal (best effort)—The built-in roll back capability is extended to allow operator plus, administrators or configurator level users to remove (deactivate) activations through the Activation History menu in Network Activation.
- Multi-platform and inter-platform capability—All workflows must be designed to operate on multiple platforms.

Network Activation Customization Tools

Customizing Network Activation requires the following tools:

- **Wizards**—You can use any text or XML editor that does not add a Byte Order Mark (BOM) to the UTF-8 XML. Network Activation does not recognize XML with BOMs. XML editors that have been used with Network Activation include NotePad++, XMLPad, and XMLSpy^R.
- **Workflows**—You must use the Prime Network Workflow. For information, see the *Cisco Prime Network 3.8 Customization User Guide*.
- **Scripts**—You can use the Prime Network Command Builder. For information, see the *Cisco Prime Network 3.8 Customization User Guide*.

Network Activation Customization Flow

The following steps outline the general flow you must follow when creating a new activation in Network Activation.

1. **Create the Scripts**—See [Chapter 5, “Customizing Cisco Prime Network Activation Scripts.”](#)
2. **Create Workflows**—See [Chapter 4, “Customizing Cisco Prime Network Activation Workflows.”](#)
3. **Create Activation Wizard**—See [Chapter 3, “Customizing Wizards with Cisco Prime Network Activation Wizard Builder.”](#)
 - Create the pages file.
 - Create the activation file.
 - Add the new activation into the Service.xml file.

Backing Up and Restoring Customized Files

Prime Network backup and restore functions back up data placed in the `$NETWORKHOME/Main/to_backup` directory as well as Prime Network registry data. In Prime Network 3.8, the Oracle database is removed from Prime Network backups. The database must be backed up following Oracle database backup procedures.

The general Network Activation backup and restore process prior to installation of a new Prime Network version includes the following:

1. **Back up user data**—See “Backing Up and Restoring the Registry,” in the *Cisco Prime Network 3.8 Administrator Guide*.
2. **Uninstall Prime Network**—See the *Cisco Prime Network 3.8 Installation Guide*.
3. **Install Prime Network**—See the *Cisco Prime Network 3.8 Installation Guide*.
4. **Install Network Activation**—See the *Cisco Prime Network 3.8 Installation Guide*.
5. **Restore user data**—See “Backing Up and Restoring the Registry,” in the *Cisco Prime Network 3.8 Administrator Guide*.

When customizing Network Activation wizards, workflows, and scripts, review the following notes to ensure customized files are adequately backed up.

- Customized wizards—If you customize Network Activation wizards using AWB (see [Using Cisco Prime Network Activation Wizard Builder to Create and Customize Wizards](#), page 3-6) or the Activation Modification Utility (see [Downloading and Uploading Wizard Files](#), page 2-22), customized wizards are uploaded to `$NETWORKHOME/Main/to_backup/MetadataDirectory/Custom`. These files will be automatically backed up during the next Prime Network registry backup.
- Customized scripts—If you customize Network Activation scripts, you must manually place the scripts in the `$NETWORKHOME/Main/to_backup` in order for them to be backed up during the next the next Prime Network registry backup.
- Customized workflows—All Prime Network workflows, including Network Activation workflows, are kept in the Prime Network Oracle database. Backing up and restoring customized Network Activation workflows should follow Oracle database backup and restore practices established at your site. For additional information, see “Workflow Administration Tasks,” in the [Cisco Prime Network 3.8 Administrator Guide](#).

**Note**

Always rename customized workflows. If you do not rename the customized workflows, they might be overwritten during the next Oracle utility database restoration.

Launching the Prime Network AWB GUI

You can launch the Prime Network AWB GUI by launching the GUI from Cisco Prime Network Web Server or Cisco Prime Network Vision. The [Cisco Prime Network 3.8 User Guide](#) describes the different methods of how you can launch the Cisco Prime Network Vision.

To launch Prime Network in Prime Central GUI, choose Assure > Prime Network > Vision. From the Network Vision thus launched, you must:

- Choose Tools > Activation Wizard Builder, to launch Prime Network AWB GUI from Prime Network in Prime Central GUI.
- Choose Tools > Workflow, to launch Network Workflow GUI from Prime Network in Prime Central GUI.

You can also launch the Prime Network AWB GUI from a single web-based page, after Prime Network is installed and started in a gateway.

For more details on launching other Prime Network applications, see the [Cisco Prime Network 3.8 User Guide](#).

Where to Go From Here

Any Network Activation wizard, workflow, or script customization requires planning and forethought. If you are just getting started, the sequence below is a general approach you might consider:

1. Review your activation requirements. Specifically, what type of activation, what attributes, and what network elements are involved? A strong knowledge of the provisioning that occurs at the device level is required.
2. Review the provided Network Activation scripts, workflows, and wizards.
3. Create a detailed customization specification that answers the following questions.

- a. Can the customization be handled through wizard customization alone? Attribute display name changes are one wizard customization that can be performed without workflow customization. For an example, see [Chapter 7, “Cisco Prime Network Activation Customization Examples.”](#) You can remove optional attributes if they are never entered in your specific activation. You can also customize the Activation tree, for example, remove activations your operators will never use.
- b. Can existing workflows be used to handle the customization? If yes, identify the workflow and specific customizations that must be made.
- c. If provided workflows cannot be used, do the provided scripts cover the customization requirements? If yes, you can begin planning the new workflow. If no, you will need to contact Cisco consulting services for support.

Table 1-2 provides a list of resources to help you with the customization details.

Table 1-2 Network Activation Customization Resources

Topic	Reference	Description
Scripts	Appendix D, “Cisco Prime Network Activation Utility Script Reference”	Comprehensive reference for all utility scripts included in Network Activation.
Scripts	Appendix C, “Cisco Prime Network Activation Script Reference”	Comprehensive reference for all activation scripts included in Network Activation.
Scripts Workflows	Chapter 6, “Cisco Prime Network Activation Workflows”	Lists the scripts called by each workflow.
Scripts	Chapter 5, “Customizing Cisco Prime Network Activation Scripts”	General information about Prime Network scripts and script customization.
Scripts	“BeanShell Commands,” <i>Cisco Prime Network 3.8 Activation User Guide</i> .	Overview on the use of BeanShell commands in Prime Network.
Workflows	Chapter 4, “Customizing Cisco Prime Network Activation Workflows”	Provides information about customizing Network Activation workflows.
Workflows	“Using the Prime Network Workflow to Create Task Workflows,” <i>Cisco Prime Network 3.8 Activation User Guide</i> .	Provides general information about using the Prime Network Workflow Editor.
Wizards	Chapter 3, “Customizing Wizards with Cisco Prime Network Activation Wizard Builder”	Provides information about customizing Network Activation wizards.
Examples	Chapter 7, “Cisco Prime Network Activation Customization Examples”	Provides step-by-step Network Activation customization examples.

