

IBM Application Runtime Expert for i

Creating Your First Template

Background

The IBM Application Runtime Expert for i, or ARE, allows users to build templates that can be used to verify application and system attributes on an IBM i system. In this document, we will introduce you to the Deployment Template Editor, which is the Web user interface that is used to build and manage deployment templates. But first, let's start by discussing some terminology; specifically, what exactly is a deployment template?

Let's take a look at the term deployment and try to understand exactly what that means. A deployment is a collection of attributes about software and the environment in which the software runs. Common examples of a deployment are:

- Any IBM i product
- Any application on the IBM i
 - An ISV or internally written application
 - A WebSphere Application Server
 - An integrated Web application server
 - An RPG application
 - A directory tree
- A custom selection of software, system and environment information

Put simply, **a deployment is the application, system, and environment information you wish to verify.**

So a template is the collection of the application, system, and environment information for your deployment. The template contains information about the deployment, such as its expected attribute values. Attribute information in the template may include object authorities, file attributes, configuration information, system values, PTF levels, and more. Once you have built this template, using the Deployment Template Editor, it can then be used to verify the condition of your deployment on the same, or other, IBM i systems. All of the information necessary to verify the deployment is contained within the template.

Before actually creating a deployment template, it is important to understand how a template is built, and it gets used once it is built. Figure 1 shows a pictorial view of the deployment template creation process.

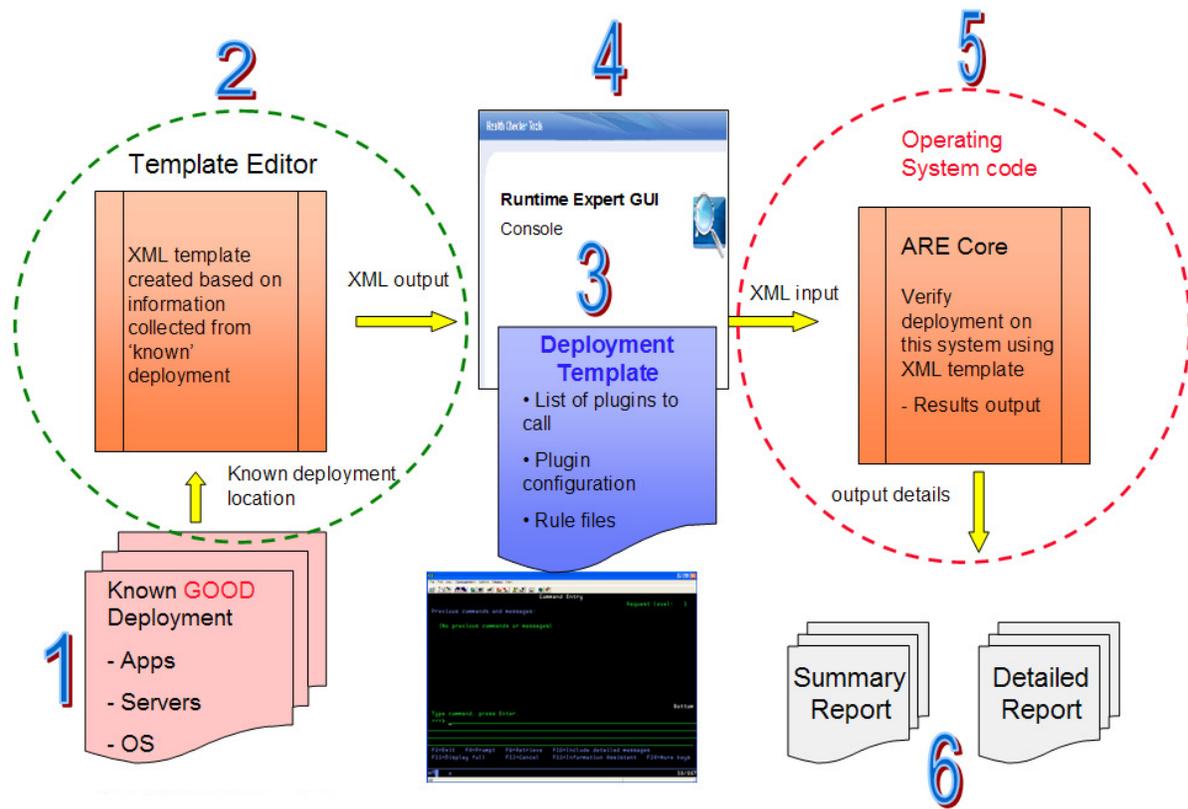


Figure 1 – The Deployment Template Editor home page

Let's start at step 1 in the lower left corner of figure 1. Before you build your template, you want to make sure that your deployment (application, system, and environment) are in a known good state. This is a **very** important step. When you build your template, the information and attributes that are put into the template are mined from the system on which the template is built. So if the deployment is not in a good state, the information mined may not be accurate. If the information in the template is not accurate, when the template is used to verify other systems, it may result in problems reported that are not really problems (so called false positives). Thankfully, you don't have to worry too much about getting your template perfect on the first try. The Deployment Template Editor makes editing and updating your existing templates fast and simple. So you can easily modify and re-built your template to add, remove, or modify attributes you wish to include in your template. We actually recommend creating your templates in an iterative manner, learning about your environment over time, and editing/updating your template based on what you have learned.

Once you think you have your deployment ready, proceed to step 2. In step 2, you sign into the Deployment Template Editor and build your template. Much more information on how to do this is provided in subsequent sections of this document. Once you have selected and customized the attributes you want to include in your template, you proceed to step 3, which is actually building the template. Building

your template is completely automated; just click the Build template button and the ARE takes care of the rest. The template is built by mining all of the application and system attributes you selected in step 2, storing the information into a series of XML files, and then finally packaging the XML files into a Java jar file.

Now that the template has been built, it can be used to verify any IBM i system with an OS level of IBM i 5.4 or newer. A system that is to be verified using a template is referred to as the *target system*. To verify an IBM i system using a template, there are a few (very common) products that must be installed on the target system, as well as recent HTTP and Java Group PTF levels. For a full list of the required products and Group PTF levels for a target system, see <http://www.ibm.com/systems/power/software/i/are/ptfs.html>

Steps 4, 5, and 6 describe the usage of a template to verify a target system. The easiest way to verify a target system is to use the ARE console. The console is a Web user interface that is accessible from the Deployment Template Editor home page.

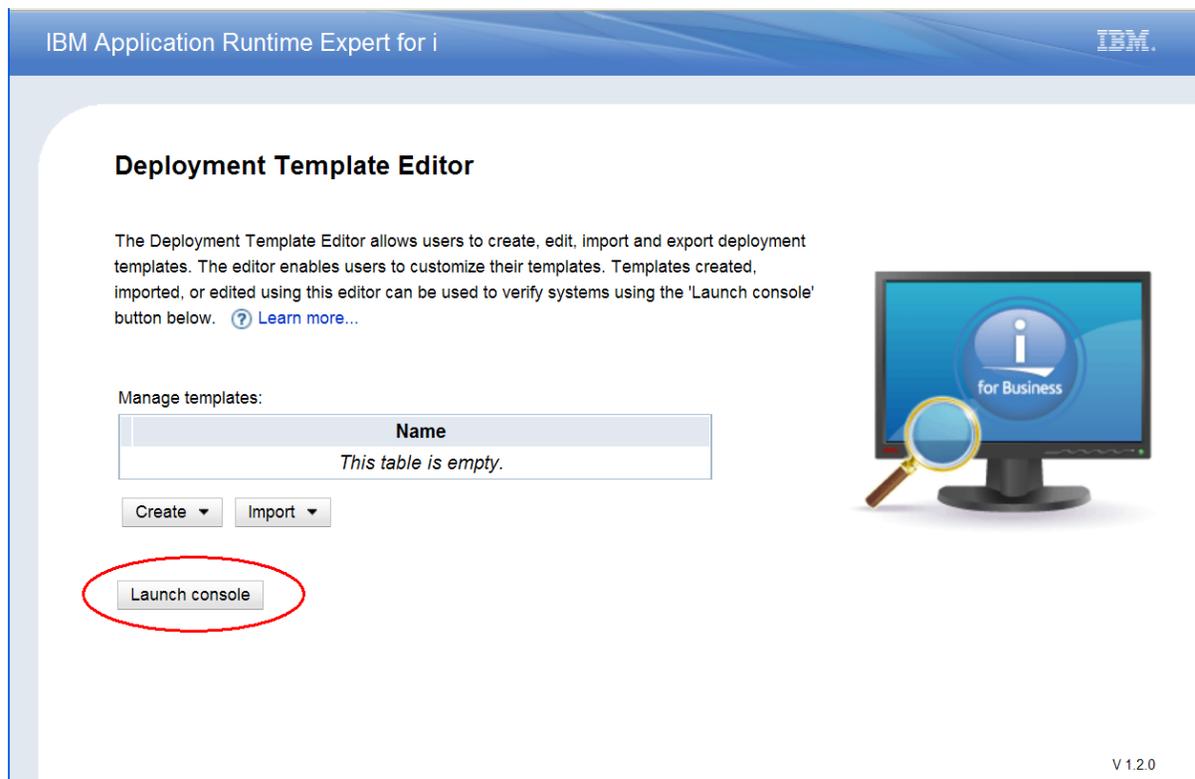


Figure 2 – Launch console button on the Deployment Template Editor home page

Alternatively, you can put the template onto the target system and use a QShell script to invoke the ARE and perform verification using the template. Either option results in the usage of the other major component of the ARE product: the ARE core. The ARE core is part of the IBM i operating system, and is available, via PTF,

on IBM i 5.4 and newer releases. The ARE core takes a deployment template and uses it to verify a target system. Any differences between the application and system attributes on the target system, and the expected values for those attributes as defined by the template, are recorded by the core during the verification. The results of the verification are written to a set of reports (summary and detailed) that can be reviewed to very quickly learn what attributes of the deployment on the target system do not match their expected values.

Important: It is very important to understand that a deployment template contains detailed information about your deployment. File authorities, attributes, values in configuration files, user profile attributes, and more may be included in your template. For this reason, when a template is creating using the ARE Web user interface, it is stored in an IFS directory that has *PUBLIC *EXCLUDE authority. If you move a template to different IBM i system, you should carefully consider what authority users have, on the system the template was moved to, to your deployment template.

Creating a new template

When you log into the ARE Web user interface, you will be directed to the Deployment Template Editor home page. It is important to note that logging into the ARE Web user interface requires an IBM i user ID that has been given *ALLOBJ special authority.



The screenshot shows the 'Deployment Template Editor' interface. At the top, it says 'IBM Application Runtime Expert for i' and the IBM logo. The main heading is 'Deployment Template Editor'. Below this, a paragraph explains the editor's functionality: 'The Deployment Template Editor allows users to create, edit, import and export deployment templates. The editor enables users to customize their templates. Templates created, imported, or edited using this editor can be used to verify systems using the 'Launch console' button below. [Learn more...](#)'. To the right of this text is an illustration of a computer monitor with a magnifying glass over it, displaying the 'i for Business' logo. Below the text, there is a section titled 'Manage templates:' containing a table with one column labeled 'Name' and the message 'This table is empty.' Below the table are two buttons: 'Create' and 'Import', both with dropdown arrows. At the bottom left, there is a 'Launch console' button. In the bottom right corner, the version number 'V 1.2.0' is displayed.

Figure 3 – The Deployment Template Editor home page

There are, upon first usage of the ARE product, no templates to display or work with. Therefore, the table listing templates on the system will be empty. To create a new template, click the Create button. You will be asked to give your template a name; once you have done that, click the Create button located to the right of the template name field.

After pressing the Create button, you will be taken to the Plugin Selection and Customization page.

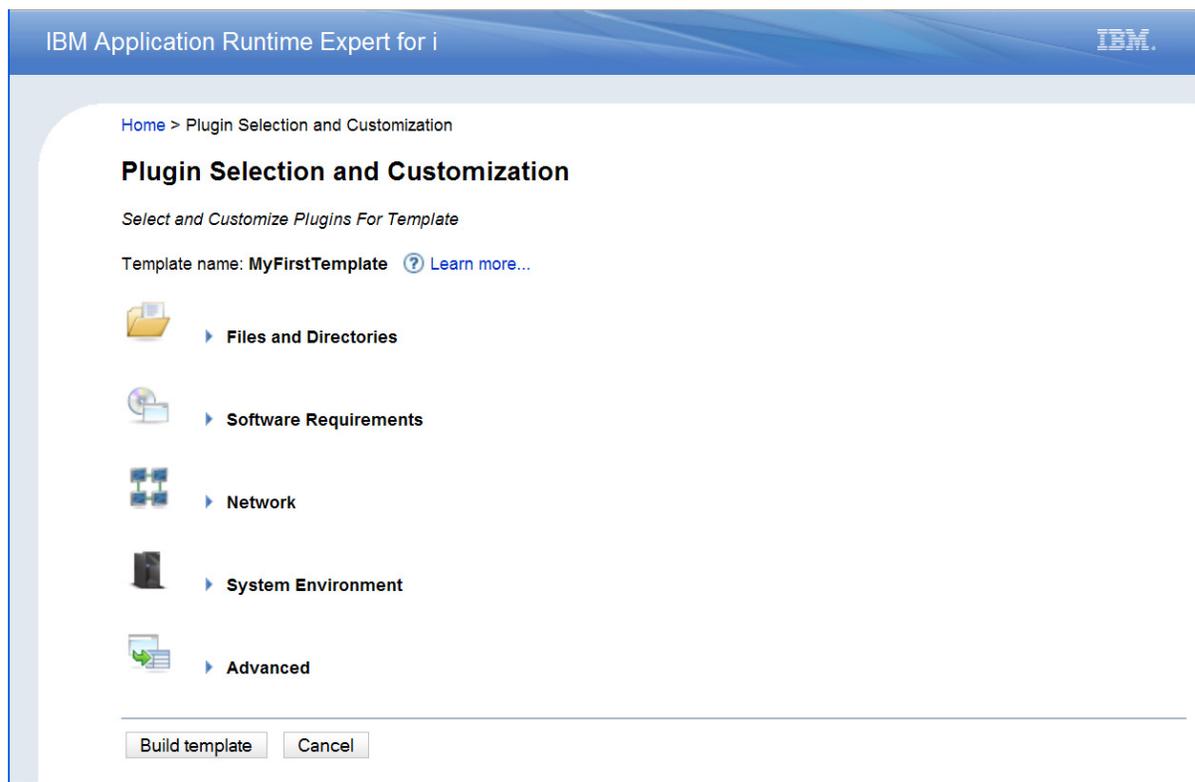


Figure 4 – Plugin Selection and Customization page

The Plugin Selection and Customization page presents you with five different categories of plugins. In the ARE, a plugin is something that is capable of checking and verifying an application or system attribute. For example, there is a File and Directory Authorities plugin that can verify authorities for files and directories on an IBM i system. There is a User IDs plugin for verifying attributes of IBM i users, and so on.

To view the available plugins in each category, click on the category icon or name. To select a plugin and customize the attributes it verifies, click on the plugin name or

the Edit ( [Edit](#)) link next to each plugin name. For more information about what a plugin does, click on the learn more ( [Learn more...](#)) link next to the plugin you are interested in learning about. For the purposes of this example, we will discuss selecting and customizing the following plugins:

- File and Directory Authorities
- IBM i Products
- User IDs

File and Directory Authorities

The File and Directory Authorities plugin is found under the Files and Directories group. Select the File and Directory Authorities plugin by clicking on its name or its Edit link. After selecting the plugin, you are taken to the collections page for the plugin. The concept of a collection deserves a brief explanation. A collection is a logical grouping of Integrated File System files and directories or a logical grouping of objects in libraries. The purpose of a collection is to create a logical grouping of related items that need to be verified. The precise checks performed by a plugin (such as the File and Directory Authorities) are customizable on a per-collection basis. For example, you could choose to verify the ownership attribute for all items in one collection, but choose to not verify that attributes for items in a different collection. Click the Add files/directories button to add a new collection. Clicking this button will take you to a page that presents you with the complete contents of the root file system.

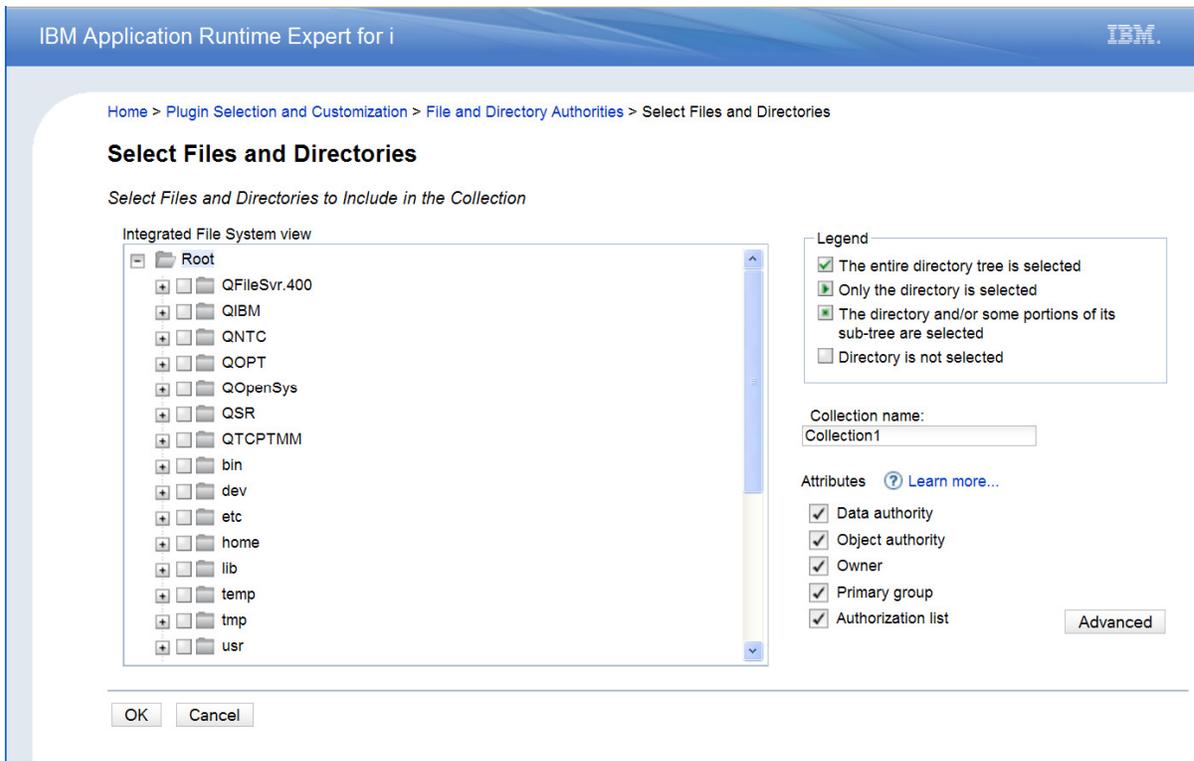


Figure 5 – File and Directory Selection

You can select as many files and directories as you wish. You have the granularity to select individual files, but you also have the ability to selection an entire directory tree. The legend in the upper right corner explains the different selection states for each item in the selection tree. You can also provide a meaningful name to assign to this collection; the default name will be 'Collection1'. Finally, you can select precisely what authority attributes will be collected, and thus verified, for this collection. Once you have finished selecting files and directories, click the OK button to return to the collections page. You may add as many collections as you want; when you are finished adding collections, click the OK button on the collections page to save the collections you have created and return to the Plugin Selection and Customization page.

IBM i Products

The IBM i Products plugin is found under the Software Requirements group. Select the IBM i Products plugin by clicking on its name or its Edit link. After selecting the plugin, you are taken to the customization page for the plugin.

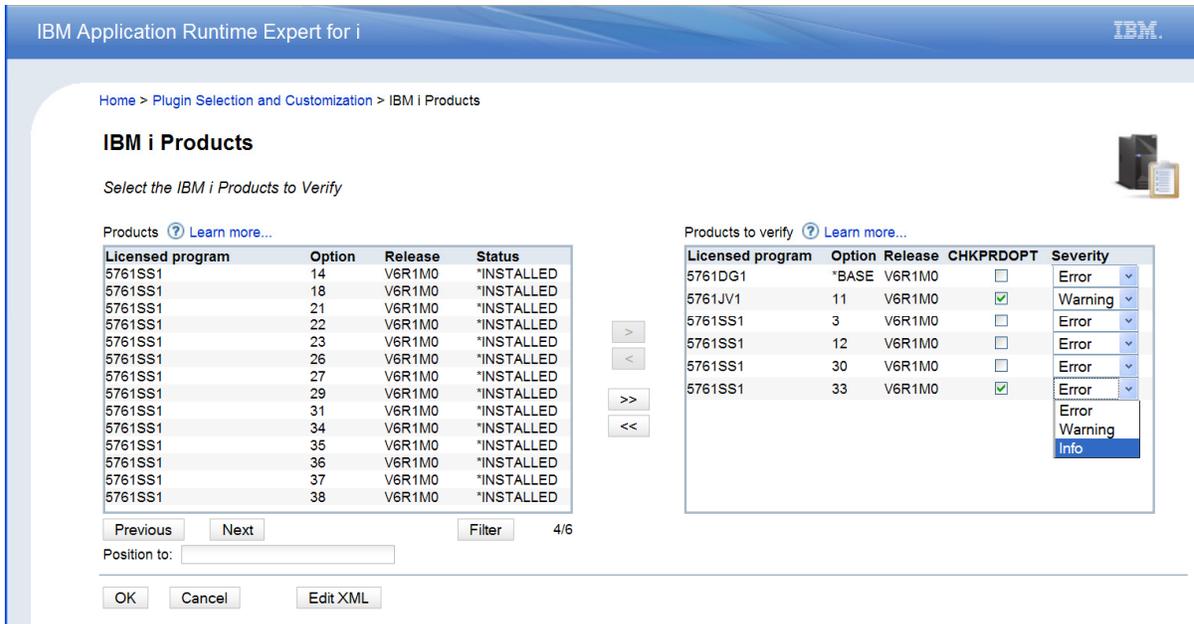


Figure 6 – IBM i Products customization page

This plugin verifies the install status of IBM i products and, optionally, also runs the CHKPRDOPT CL command to further verify the product is installed and in a good state. All products installed on the IBM i system where the ARE is running are listed in the 'Products' selection box. All products that have been selected, and will be part of the template used to verify other systems, are listed in the 'Products to verify' selection box. Initially the Products to verify selection box is empty; move any product you wish to verify into the Products to verify selection box.

Additional customizations for this plugin include the capability to have the CHKPRDOPT CL command run for any product that is verified. This option is enabled by selecting the CHKPRDOPT check box. You can also customize the problem severity level for any product that gets verified. The severity level determines how a problem gets reported, and there are three possible values: Error, Warning, or Info. Customizing the severity level gives you the flexibility to assign different levels of importance to differences found between the template and the target system during verification. For example, if you require that the IBM i product 5761JV1 option 8 be installed on a system, you may want to assign the check for that product a severity of Error. If you recommend, not require, that 5761JV1 option 11 also be installed on a system, you may want to report this product not being installed with a lower severity, such as a Warning or Information message.

Once you have selected the IBM i products you wish to verify, click the OK button to save your selections and return to the Plugin Selection and Customization page.

User IDs

The User IDs plugin is found under the System Environment group. Select the User IDs plugin by clicking on its name or its Edit link. After selecting the plugin, you are taken to the collections page for this plugin. The concept of a collection for User IDs is the same as for File and Directory Authorities; you can select different users for each collection, and the precise attributes verified for the user IDs can be customized on a per-collection basis. Click the Add button to add a new collection; this takes you to the customization page for the new collection.

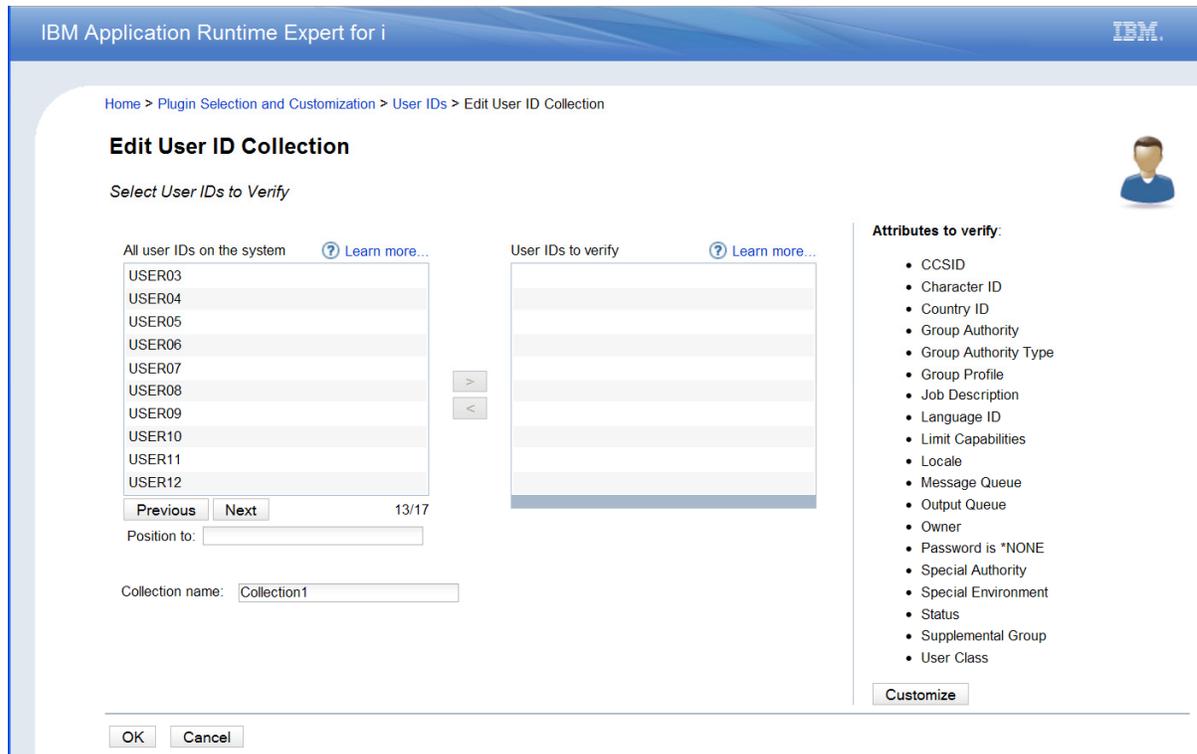


Figure 7 – User IDs customization page

This plugin verifies many different attributes of IBM i user IDs. All of the user IDs present on the IBM i system where the ARE is running are listed in the 'All user IDs on the system' selection box. All user IDs that have been selected, and will be part of the template used to verify other systems, are listed in the 'User IDs to verify' selection box. Initially the User IDs to verify selection box is empty; move any user IDs you wish to verify into the User IDs to verify selection box. The user ID attributes that will be verified are listed to the right of the selection boxes. Click the Customize button to specify precisely which user ID attributes you wish to verify. Remember that the attributes to verify are scoped to a collection, so if you want different attributes verified for different user IDs, all you need to do is create multiple collections and customize the verification attributes for each collection.

Once you have selected the user IDs you wish to verify, click the OK button to save your selections and return to the Plugin Selection and Customization page.

Build the Template

You have now selected and customized three different plugins. Take time to explore the rest of the plugins in the Deployment Template Editor. Now that you have learned some of the basic concepts and customized a few plugins, customizing the other plugins will be simple and intuitive. To build your template, click on the Build template button at the bottom of the Plugin Selection and Customization page.

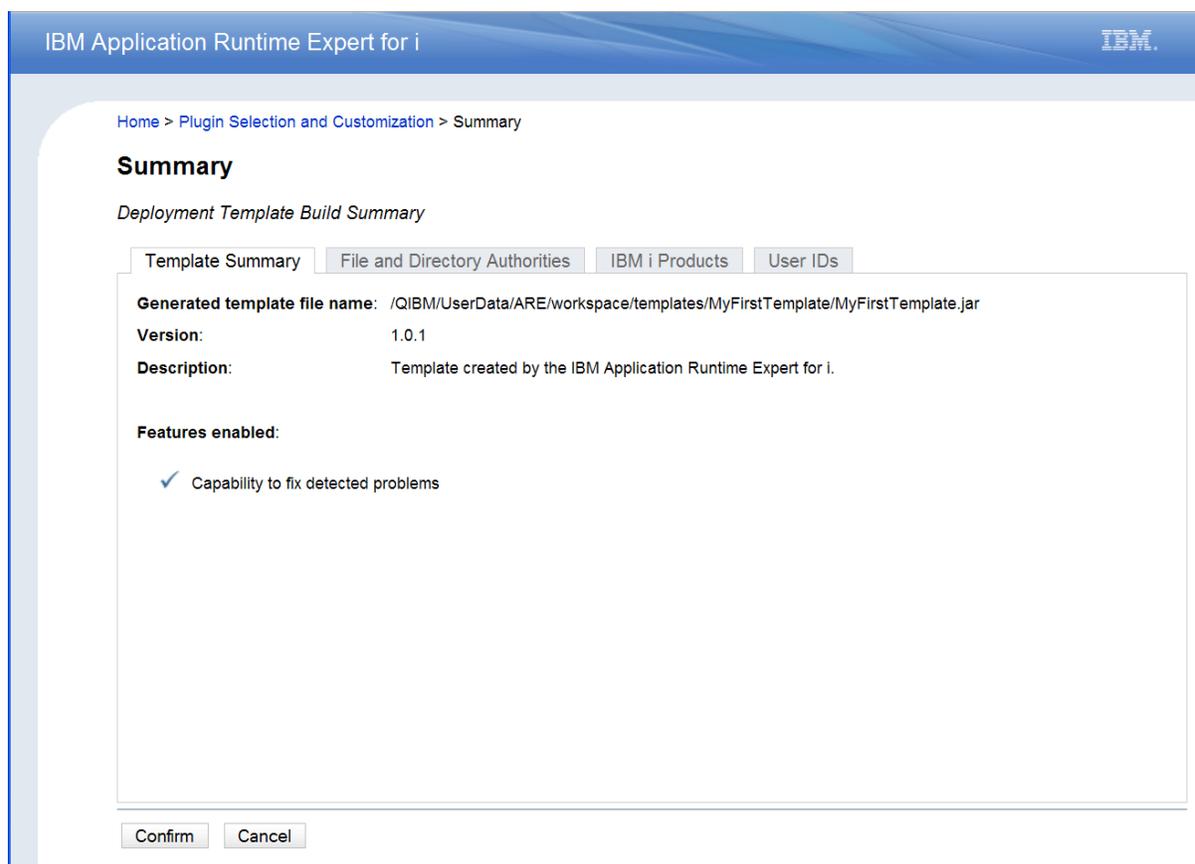


Figure 8 – Deployment Template build summary page

The summary page has tabs for each plugin you selected; the tabs summarize the customizations you made. This is a great opportunity to review your selections and choices prior to building the template. If you see anything wrong or missing, click the Cancel button to return to the Plugin Selection and Customization page. Once you have confirmed your choices, click the Confirm button. This will initiate the build of the template. Depending on several factors (system speed, available memory, number of plugins selected, etc) your template may build in under a minute or, more

likely, will take several minutes to build. Once the template has built, you will be returned to the Deployment Template Editor home page, and a dialog in the lower right corner will indicate that your template has been successfully built.

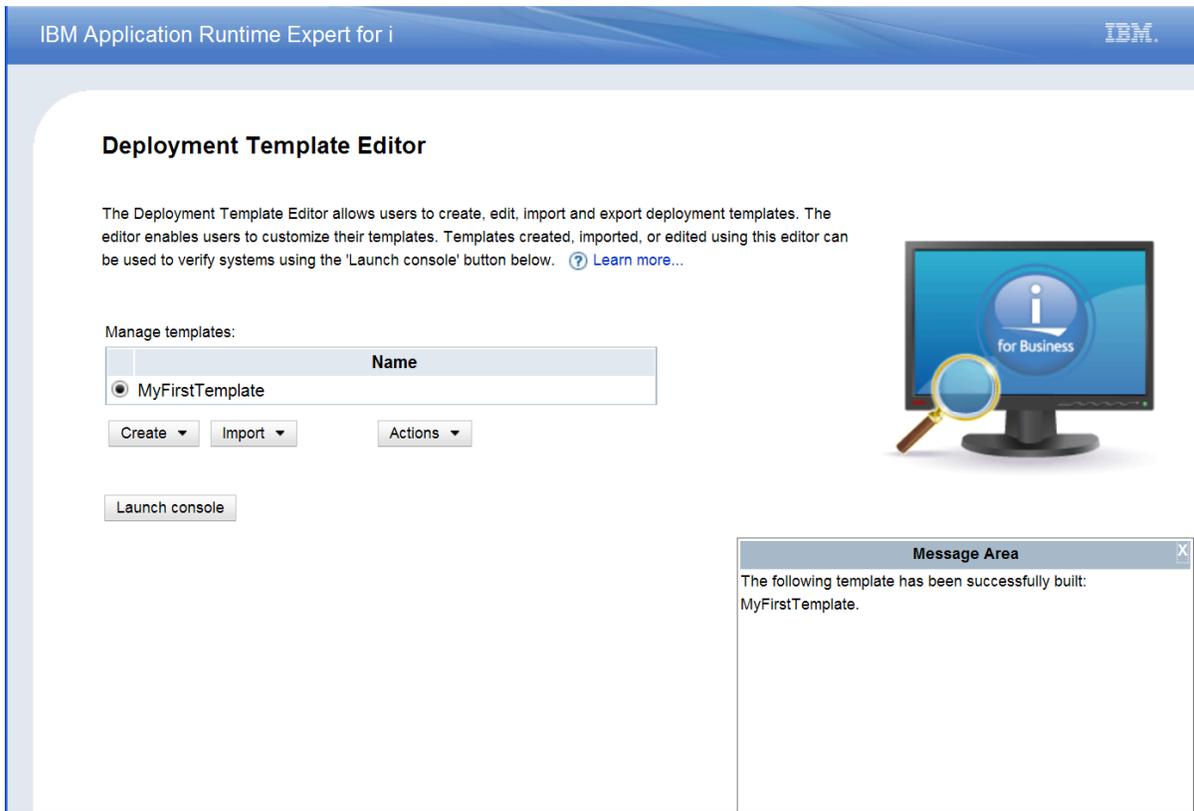


Figure 9 – Deployment Template build summary page

Congratulations! You have now successfully built your first template. Note in figure 9 that your newly built template is now listed in the Manage templates table. Also note that there is a new button available: Actions. When clicked, this button lists all of the actions you can perform on the selected template. Actions include edit, export, delete, rename, copy, and more.