Hewlett Packard Enterprise

Codar

Software version: 1.90

For Linux operating system

Codar Plugin Automation for Continuous Integration Tool

Document release date: September 2017

Software release date: September 2017

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Introduction

Codar is a continuous delivery automation tool which supports deployment steps and pipeline process automation. It is always the choice for the customer to integrate the CI tool with continuous delivery tool like Codar in order to automate the process of CI-CD.

Any code which is built by the build tool should be first deployed and verified on the dedicated environment before it is consumed by other lifecycle stages. This will help the team to regress the code further and finally rollout to production.

The content of this whitepaper will expose the API's which are really required to connect or integrate CI with Codar tool.

Also the steps to automate the integration process are documented in this whitepaper. For any more details on the product features please refer the product guides.

Types of designs

There are two types of designs which are supported by Codar which are Topology and Sequence. This section will explain the list of API which are to be used to automate the integration of CI tool with Codar's topology design and Codar's sequence design.

Codar Topology Design

Following are the information which are required to automate the integrate,

1. Application design id
2. Component Id
3. Application JSON to fetch the component property names which are modifiable by CI tools
4. Create package API or flow
5. Promote package API or flow with continuous promote yes or no option

There are multiple ways to get the above information. One of the easiest way is to export the topology design as JSON and the id can be fetched from it. The other option is to access swagger API portal to get the list of designs which will have all the design id with JSON body. In this topology example we are going to get the information from topology JSON and for sequence design we will see how to fetch the same information through API in the section <TODO>

Steps to fetch the information which are required to integration topology application design with CI tool

1. Login to Codar
2. Go to Designs→ Topology → Designer → Search (type the application name you want deploy through CI-CD integration)
3. Go the specific version of the application design
4. On the gear box  click on the Export
5. This will download a generated JSON file
6. Open the JSON file which is of below format and the highlighted string is the id of this design

```
{
  "@self" : "/csa/api/topology-model/topology/b81bab25-c2ef-4fc3-88f3-cb8cb6e916d1",
  "@type" : "urn:x-hp:2013:software:cloud:topology_model:topology",
  "groupId" : "com.hp.csa",
  "artifactId" : "c805f5de5e5447d9b1a262a8f445dd29",
  "version" : "5.0.0",
  "displayName" : "PetClinic Application -  Partial Design - Release",
  "description" : "A two-tier PetClinic Application with Database component installed on MySQL
```


7. In order to get the component id which contains the parameters which are modifiable during deploy or re-deploy , scroll down to look for the component names which will give the detailed information about the component and id.

   In the sample JSON the component name “PetClinic Application 4 Partial Design’ has the modifiable property which is “artifacturl”. Search for this component name and fetch the id highlighted as given below,


```
  "requirements" : [ ]
}, {
  "id" : "9b4da342-8b49-8c5d-1db4-8062778c9e3b",
  "name" : "PetClinic Application 4 Partial Design",
  "component" : {
    "@self" : "/csa/api/topology-model/component-type/a22516ee-ff82-4686-ad10-33056421f08f",
    "groupId" : "com.hp.csa.type.HPOO",
    "artifactId" : "PetClinicApplication4PartialDesign_bfccdc9dfdf14de788131fd7fdb80f0f",
    "version" : "1.50.0000"
  },
```


   Property which is modifiable during deploy or re-deploy which is present as part of this component. The value of this property should be set by the CI tool


```
    }
  }, {
    "propertyKey" : "artifacturl",
    "propertyValue" : {
```


8. By following the above step you should have application design id, application component id and the property which are required to be modified from CI tool.

Codar Sequence Design

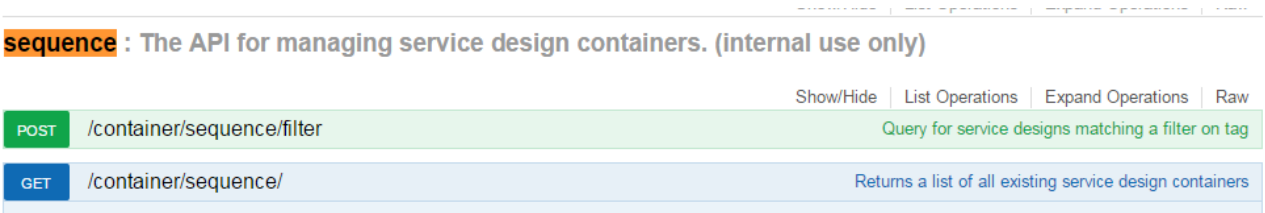
As mentioned in the previous section, it will require APIs to provide all the required information to automate the integration between CI tools with Codar’s sequence design.

Steps to fetch the information which are required to integration sequence application design with CI tool

1. Login to Codar
2. Attach the following URI with the logged-in URL “apidocs.jsp” so the URL should be as given below

   https://Codarmc:8444/csa/apidocs.jsp#!/

   Go to the section “sequence: The API for managing service design containers. (internal use only)”



3. Click on the “Try it out” button on the subsection. This will list all the sequence design along with the JSON body.

GET /container/sequence/ Returns a list of all existing service design containers

Implementation Notes

The API response returns the collection of containers for service designs existing in the system.

Parameters

Parameter	Value	Description	Parameter Type	Data Type
start-index		Specifies the offset of the first entry to be included in the page.	query	integer
page-size		Specifies the page size.	query	integer
sort		Name of field to be used in ordering optionally followed by colon and 'ascending' or 'descending'	query	string
after		Filter members to those modified at or after this timestamp. Uses SimpleDateFormat("yyyy-MM-dd'T'HH:mm:ss.SSS'Z'") in UTC	query	string
before		Filter members to those modified before this timestamp. Uses SimpleDateFormat("yyyy-MM-dd'T'HH:mm:ss.SSS'Z'") in UTC	query	string

Error Status Codes

HTTP Status Code	Reason
404	No containers found.
403	Authorization failure

Try it out!

4. The below JSON body will contains the information about the application container id as well as the versions under this container. The members section will give the version id of the sequence design. In the below screen shot the id's which are inside the box are application version design id.

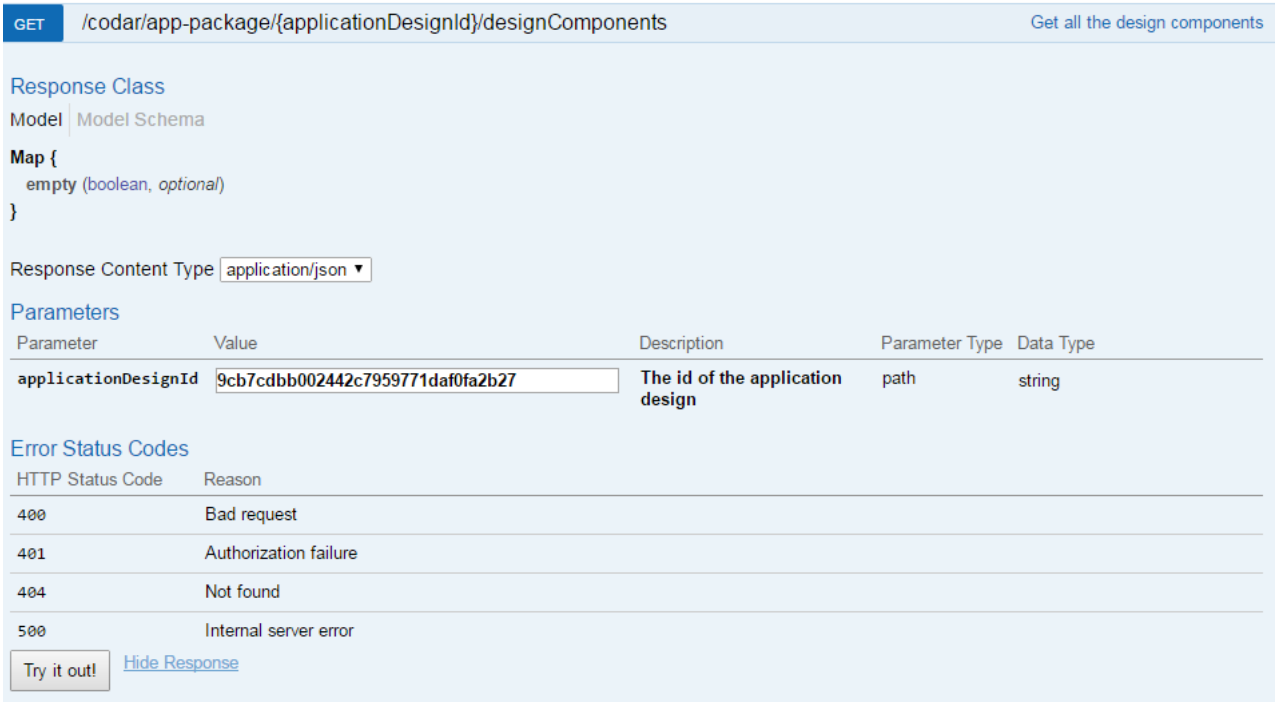

```
{
  "@self": "/csa/api/container/sequence/f5310bb1135845c7b0374f85980e62a4",
  "@type": "urn:x-hp:2012:software:cloud:data_model:blueprint:collection",
  "@created": "2016-09-23T13:41:37.397Z",
  "@modified": "2016-09-23T13:52:36.581Z",
  "global_id": "f5310bb1135845c7b0374f85980e62a4",
  "name": "vCenter Compute with Basic Options",
```

```
 "members": [
   {
     "@self": "/csa/api/service/design/9cb7cdbb002442c7959771daf0fa2b27",
     "@type": "urn:x-hp:2012:software:cloud:data_model:blueprint",
     "@created": "2016-09-23T13:41:38.198Z",
     "published": false,
     "version": "16.07b",
     "upgrade_available": false,
     "designId": "9cb7cdbb002442c7959771daf0fa2b27"
   },
   {
     "@self": "/csa/api/service/design/3afb4361e79f4caca092e90aa1c18cfa",
     "@type": "urn:x-hp:2012:software:cloud:data_model:blueprint",
     "@created": "2016-09-23T13:52:36.581Z",
     "published": false,
     "version": "16.07",
     "upgrade_available": false,
     "designId": "3afb4361e79f4caca092e90aa1c18cfa"
   }
```


5. Now the next step is to fetch the component id(s) present inside application version JSON body. This information also can be fetched from the swagger API available as part of Codar.

Go to the section from “https://Codarmc:8444/csa/apidocs.jsp#!/ “

6. Open the API “GET /codar/app-package/{applicationDesignId}/designComponents” and provide the application version design id to fetch the component information by clicking “Try it out” button



7. The component id can be fetched from the response body (JSON output) which is show from the above API after “Try it out!”

   The highlighted id is the component id which should be used to pass any input to the property which is present as part of the component. The “displayName” is the property name which is highlighted in the second box in the below screen shot

Note: Sequence based design Codar does support all properties as modifiable but re-deploy is not possible.

Integration Automation

Here is the master piece which is going to integrate CI tool with Codar. Codar has got an HPE Operation Orchestration (HPE OO) flow which can automatically create a package and do a continuous promote release pipeline or mere deployment on first lifecycle stage.

The OO flow name and the path is "Library/Integrations/Hewlett-Packard/Cloud Service Automation/Components/CODAR/Devops/Continuous Deployment Flow.xml"

The OO flow can be triggered remotely from a command line tool called "RSFlowInvoke.exe" with the required options.

On **Linux** environment **JRSFlowInvoke.jar** can be used to trigger the workflow with the same option.

RSFlowInvoke.exe and JRSFlowInvoke.jar is supported only for HPE OO Central 9.x version but this tools still works with 10.x version.

HPE OO 10.x comes with the tool called "OOSH.bat/OOSH.sh" to accomplish the same task of invoking or triggering the OO flows remotely from a CIT tool. This tool may be further enhanced in the next version which can be invoked as standalone tool.

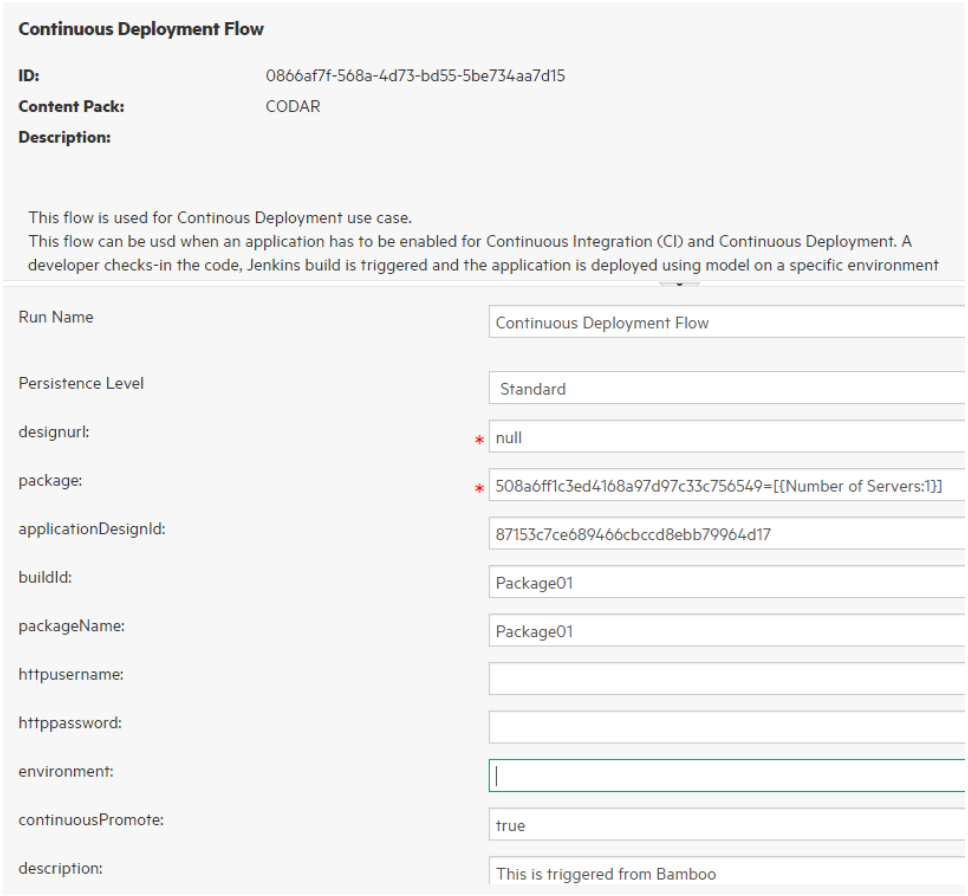
This flow will take the following input in order to remotely trigger an OO flow,

RSFlowInvoke.exe -host <CODARHOST>:<CODARPORT> -flow 0866af7f-568a-4d73-bd55-5be734aa7d15 -a Basic -u <OO Central Server Username> -p <OO Central Server Password> -t <Flow Timeout> -inputs "<Input to the application flow>"

Sample Command

RSFlowInvoke.exe -host 16.103.31.119:8445 -flow 0866af7f-568a-4d73-bd55-5be734aa7d15 -a Basic -u admin -p cloud -t 600 -inputs "codarusername=codaruser&codarpassword=admin@123&designurl=null&package=508a6ff1c3ed4168a97d97c33c756549=[{Number of Servers:1}]&applicationDesignId=87153c7ce689466cbccd8ebb79964d17&buildId=Package1&packageName=Package1&continuousPromote=true&description=This is triggered from bamboo"

In the above command the option input has the following values,



The password can be encrypted using the same tool and passed with an option “-ep”

The SDK guide explain much more details about this tool with all the options.

This flow can be invoked from any CI tool with any of the native plugin.

Sample Implementation

In this section we are going to show how a Codar plugin can be created for a CI tool using the native features of the CI tool.

The sample tool taken is Bamboo. Please note that Codar already has a bamboo plugin to trigger topology based design with continuous promote yes or no option. In this sample we are going to see how a sequence design can be used in a pipeline to stand up an infrastructure, along with that install or configure the software and deploy the application remotely and how a pipeline can be kick started from Bamboo.

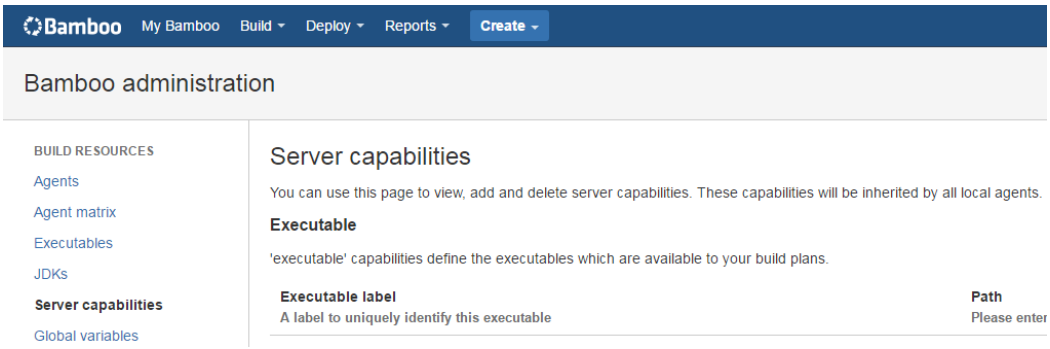
For more details on the Bamboo CI tool please refer the Bamboo help guide.

In the above or previous section we say how a flow can remotely invoked using a tool called “RSFlowInvoke.exe”.

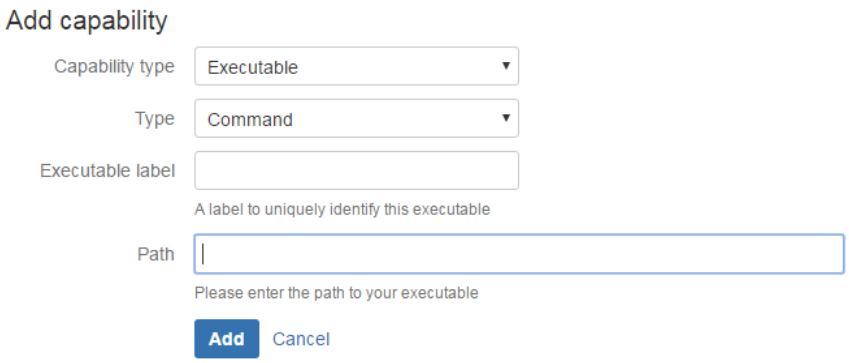
We will now see how this tool can be integrated with Bamboo and start an application release pipeline by passing appropriate inputs.

Step to add an executable within Bamboo too.

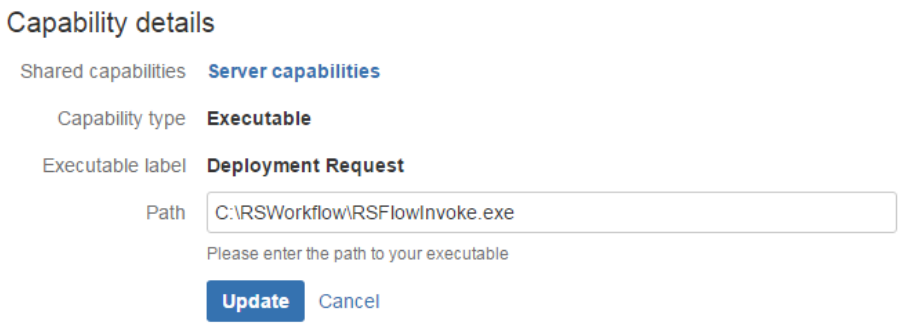
1. Create new executable in the Server capabilities as given in the below screen shot.



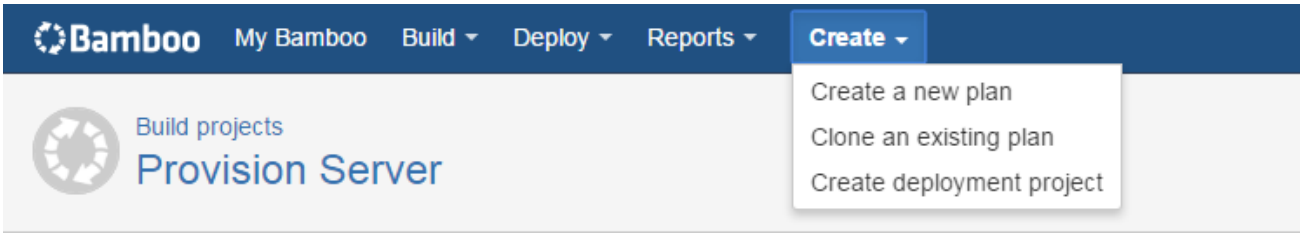
2. Create a new capability



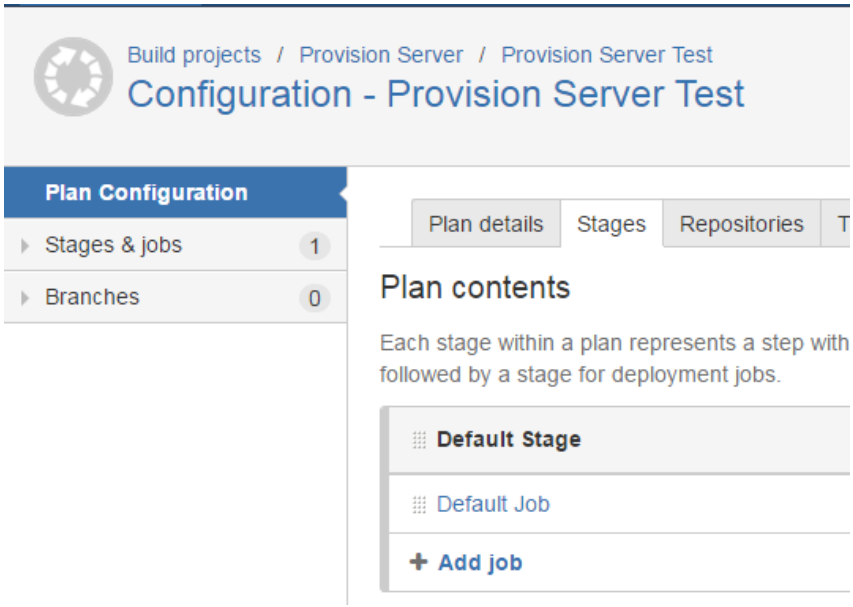
3. Copy the “RSFlowInvoke.exe” tool on the Bamboo system and place it under a directory. The “Path” should have the value as given below in the screen shot which is the actual path of the RSFlowInvoke.exe which is present on the Bamboo system.



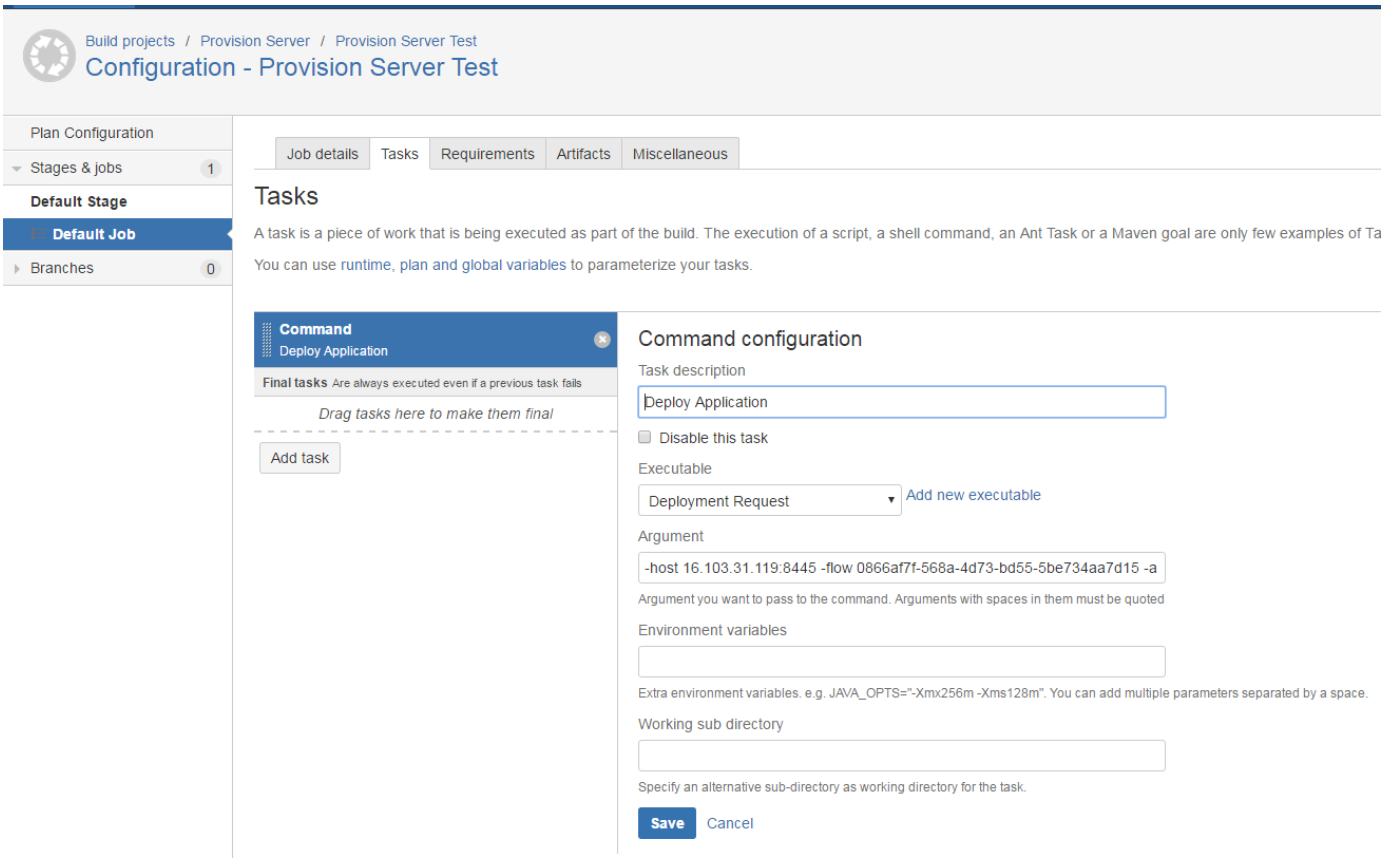
4. Create a “new build plan”



5. Click on the “default job”



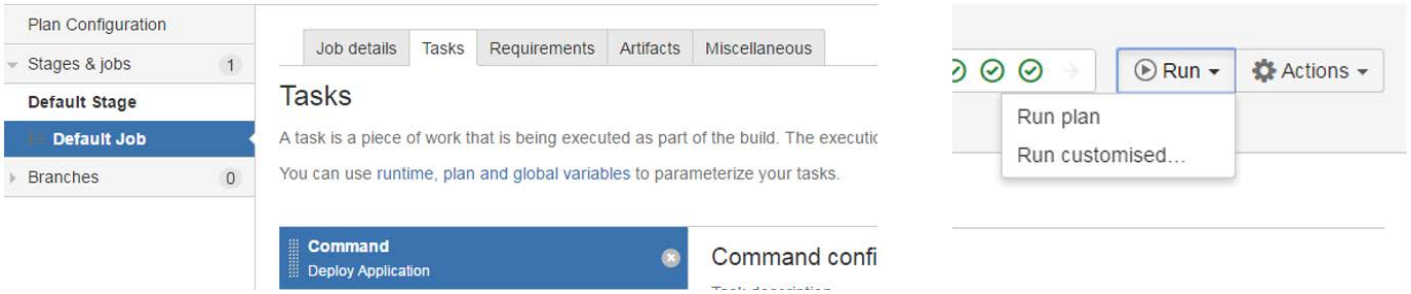
6. Add Task to the default job



7. In the above screen shot the executable selected is already configured executable for “RSFlowInvoke.exe”

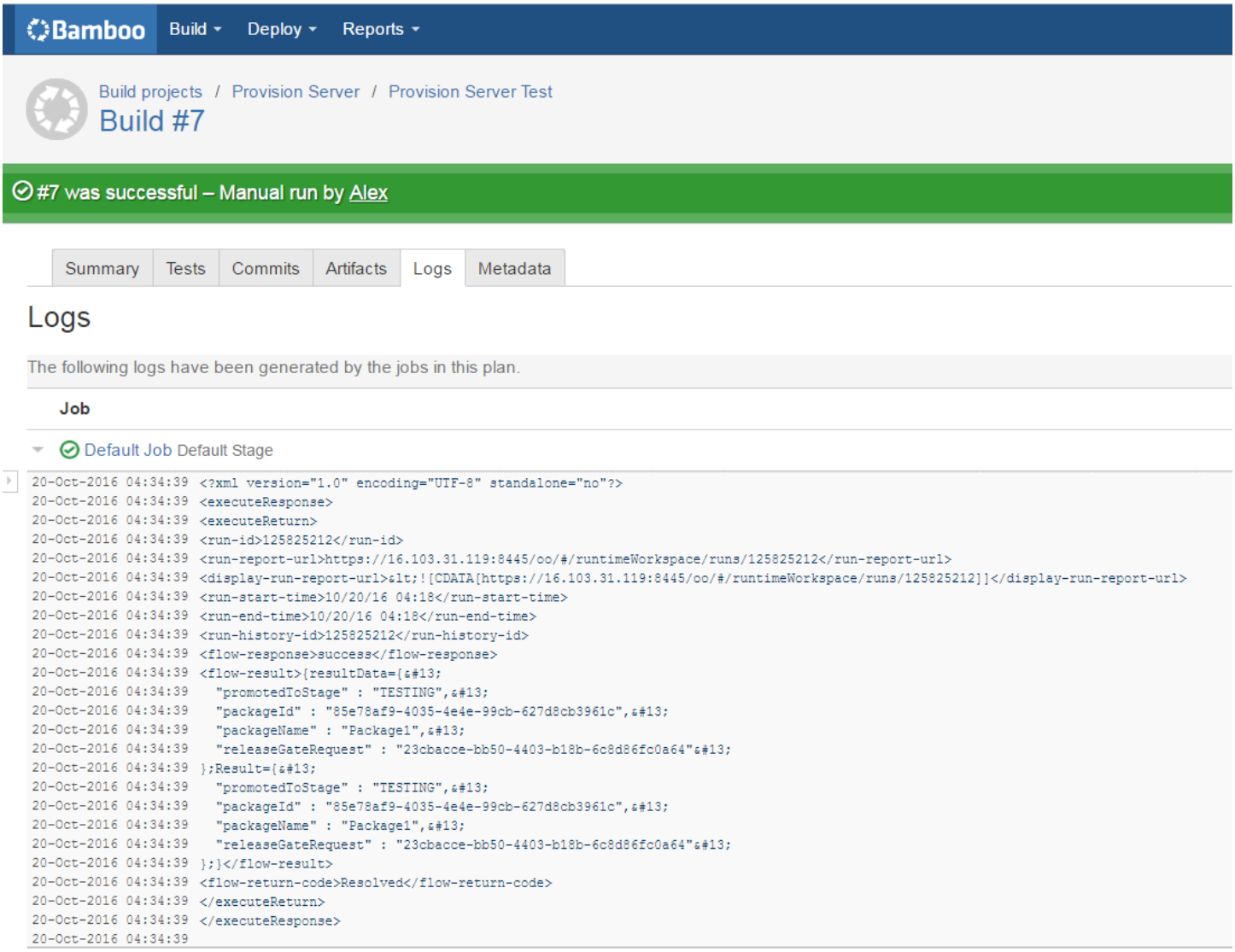
   The arguments should be the RSFlowInvoke.exe arguments which is given below and explained in the “Integration Automation” section.

8. Once it is configured trigger a test run to test the configuration by clicking the highlighted item in the box



This is currently configured as part of the build task but this certainly can be configured as part deployment job as well

The below is the output of the run triggered from Bamboo plugin which invokes the OO flow to start the pipeline after creating the package in the design configured.



Conclusion

The instructions given in the whitepaper can be used to develop a quick and simple plugin for any CI tool to integrate with Codar in order to initiate the continuous pipeline after creating the package with required inputs. The API's reference in this whitepaper may get enhanced and please follow the Codar guides which has references for all the APIs.

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