

ORACLE®

Oracle Digital Assistant

The Complete Training

Building Conversational Unit Tests

Safe Harbor Statement

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Topic Agenda

- 1 ➤ Conversation testing
- 2 ➤ Test Suite
- 3 ➤ Handling dynamic content in bot responses
- 4 ➤ Updating failed test cases

Topic Agenda

- 1 Conversation testing
- 2 Test Suite
- 3 Handling dynamic content in bot responses
- 4 Updating failed test cases

Conversation testing challenges

- Skills have no single conversation path
 - User-bot conversations are not sequential
 - Conversations may branch based on selected values
 - Different users use different conversation paths
 - First time users vs. experienced users
- Skills can be versioned, cloned or extended
 - Skills core functionality needs to be verified after modification
- Manual tests are labor intensive

Sample: pasta ordering conversation paths to test

User input

Expected conversation path

Expected outcome

"Hi"

welcome flow

Hi, I am a pasta bot. You can order pasta or ask for the menu

"Please show the menu"

Show menu flow

"I like to order pasta"

NLP flow

Your bacon pasta with garlic and oil is on its way

"I like to order a pasta with bacon"

Skip menu flow

"I like to order a pasta with bacon, garlic and oil"

full entity extraction flow

Integrated conversation tester

- Conversation flow can be tested without messenger
 - Simulates messenger types
- Displays the following information
 - Variables and their values
 - Postback actions
 - Resolved intents
 - Dialog flow states visited
 - Full bot response (JSON)

The screenshot displays the Oracle Integrated Conversation Tester interface. It is divided into several sections:

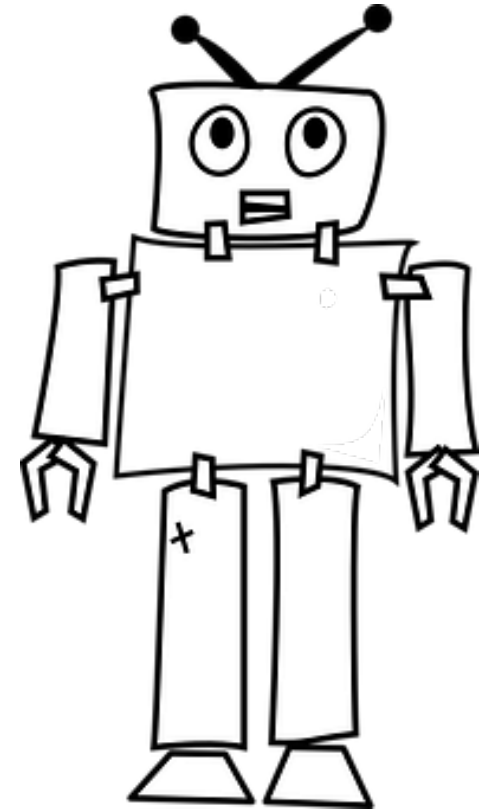
- States:** A vertical flow diagram for the skill 'advt24hrsflowers_ReferenceBot Skill'. The states are: showFlowersMenu, setFlowerNameToOrderProductName, askQuantity, ensureAtLeastOneItemOrdered, confirmOrderAndQuantity, and askDeliveryOption.
- Variables:** A list of variables and their values:
 - orderNumber: 24hrsflwrs_1541662087545
 - system.entityToResolve
 - orderQuantity: number: 12, entityName: NUMBER, type: Integer
 - orderProductName: Roses
 - deliveryCostOptions
 - orderMenuRangeSize: 4
 - advtImagesHost: https://advt24hrsflowersimage
 - flowersName: Roses
 - menu
 - useTranslationService: true
- Postback Actions:** A table with columns for Label, Action, and Variables.

Label	Action	Variables
		deliveryOption: overnight deliveryCost: 10
		deliveryOption: sameday deliveryCost: 20
		deliveryOption: courier deliveryCost: 35
		deliveryOption: parcel service deliveryCost: 0
- Testing Skill:** A chat simulation window showing a user input: 'I like to order 12 red roses for overnight delivery'. The bot responds: 'Understood. I noted 12 item(s) of "Roses" for you.' followed by a question: 'How do you like your order to be delivered?'. Below the question are four options: 'Over night delivery (+10\$)', 'Same day delivery (+20\$)', 'Instant delivery by courier (+35\$)', and 'Parcel service (free shipping)'.

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A **conversation** is the **test unit** in
Oracle Digital Assistant



Terminology

- Test Suite
 - Collection of test cases
 - Unit of execution
- Test Case
 - Represents a conversation users may have with a skill
 - Sequence of utterances and expected responses
- Utterance
 - A single step in a test case
 - Represents a user input and an associated expected bot response
 - If utterance fails testing, testcase is not continued

Enabling test cases

Development

Home

Development

Analytics

Settings

Authentication Services

Translation Services

Data Management

Feature Management

ORACLE Digital Assistant

Settings • Feature Management

Feature

Current profile: Defaults

Enable all

▶ Chat Server	On	On
▶ LOCATION System Entity	On	On
▶ Test Suite	On	On

Switch profile

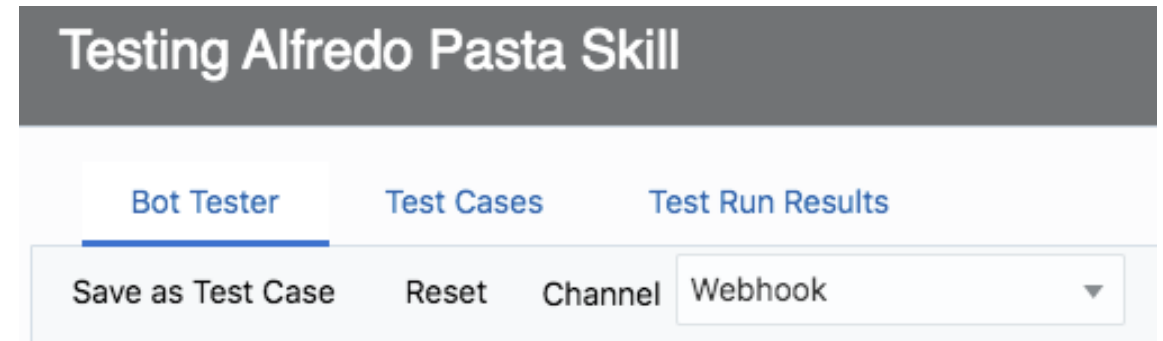
Conversation tester views

Test suite disabled



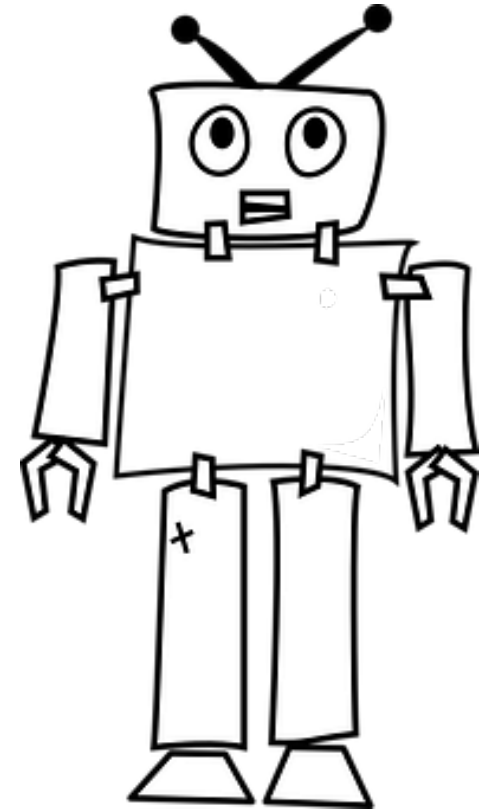
- Ad-hoc testing of conversations
- Simulates messenger channels
 - "Webhook" as the default

Test suite enabled

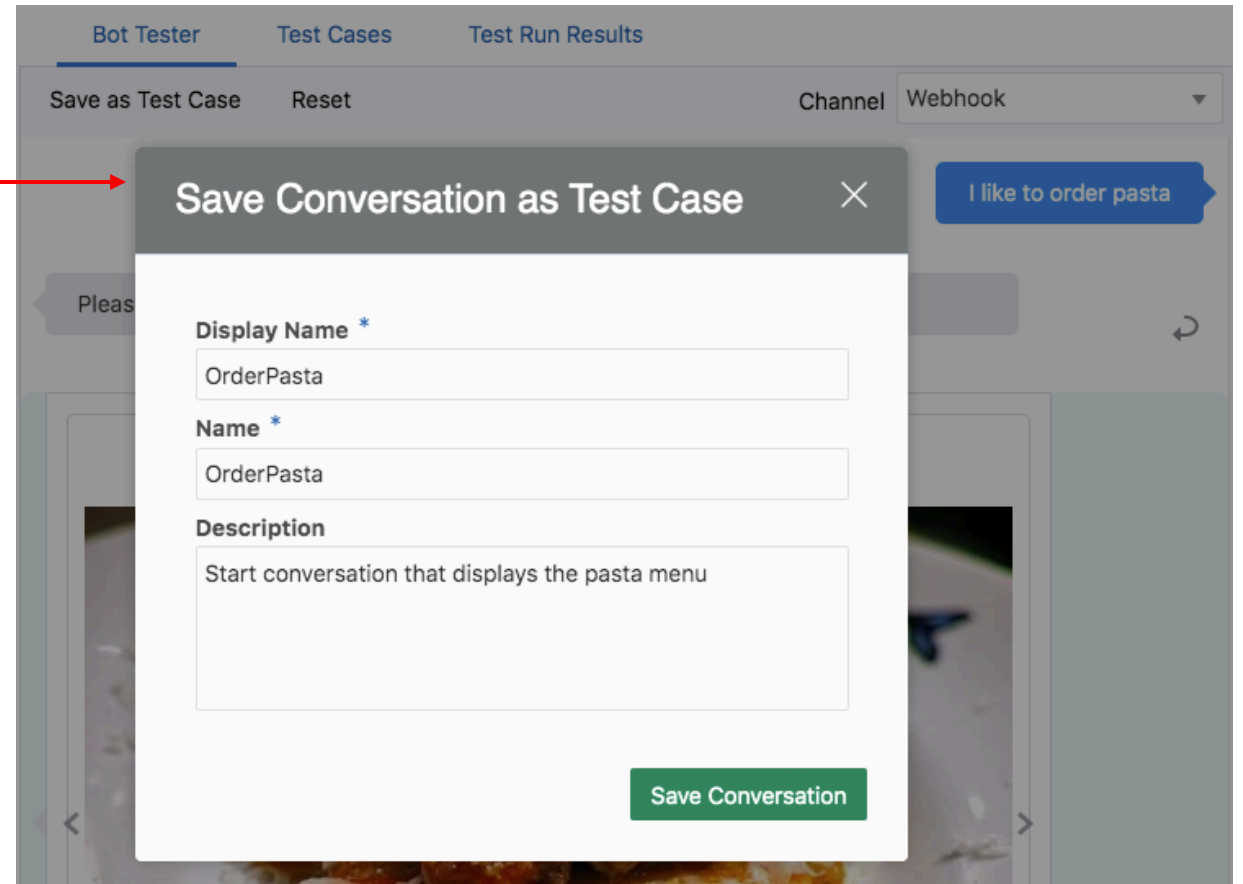
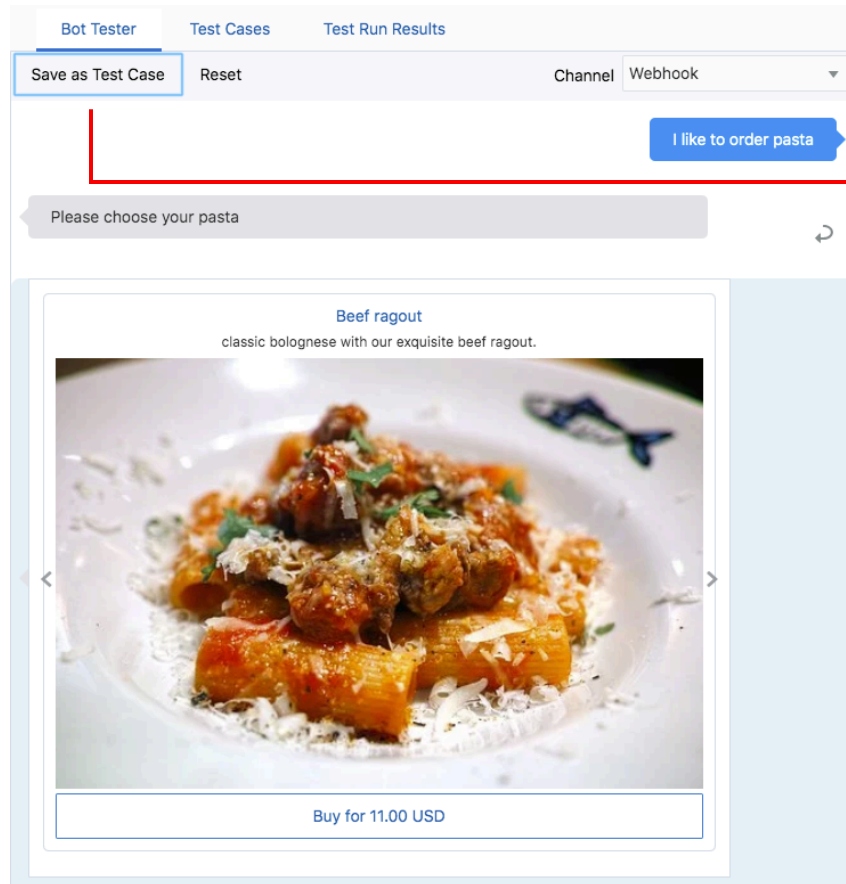


- Ad-hoc testing and test-cases
- Save ad-hoc tests as test case
- Manage and run test cases

You can create test cases for your skills
by **saving conversations with the bot**
in the tester



Creating a test case from a conversation



Test case created from a conversation

Bot Tester

Test Cases

Test Run Results

+ Test Case

Run All Test Cases

Filter

Sort By

Display Name Ascending

OrderPasta

Page 1 of 1

Enabled

Run

* Display Name

OrderPasta

* Name

OrderPasta

Description

Optional test case short description

? Variables

* Conversation

```
1 [
2   {
3     "source": "user",
4     "type": "text",
5     "payload": {
6       "message": "I like t oorder pasta"
7     }
8   },
9   {
10    "source": "bot",
11    "type": "text",
12    "payload": {
13      "message": "I am really sorry, but it seems that what you asked for is not a
choice on our menu."
14    }
15  },
16  {
17    "source": "user",
18    "type": "text",
19    "payload": {
20      "message": "I like to order pasta"
21    }
22  }
23 ]
```

Select or delete test case

Test case created from a conversation

Bot Tester Test Cases Test Run Results

+ Test Case **Run All Test Cases**

Filter

Sort By Display Name Ascending

OrderPasta

Page 1 of 1

Enabled ☒ ← Disable test case so it does Not execute in test suite **Run**

* Display Name OrderPasta

* Name OrderPasta

Description Optional test case short description

? Variables

* Conversation

```
1 [
2   {
3     "source": "user",
4     "type": "text",
5     "payload": {
6       "message": "I like t oorder pasta"
7     }
8   },
9   {
10    "source": "bot",
11    "type": "text",
12    "payload": {
13      "message": "I am really sorry, but it seems that what you asked for is not a
choice on our menu."
14    }
15  },
16  {
17    "source": "user",
18    "type": "text",
19    "payload": {
20      "message": "I like to order pasta"
21    }
22  }
23 ]
```

Test case created from a conversation

The screenshot displays the Oracle Bot Tester interface with the 'Test Cases' tab selected. On the left, there are buttons for '+ Test Case' and 'Run All Test Cases', a filter input, and a 'Sort By' dropdown set to 'Display Name Ascending'. A list of test cases shows 'OrderPasta' selected. The main area contains a form for the test case 'OrderPasta', which is enabled. The form fields include 'Display Name' (OrderPasta), 'Name' (OrderPasta), and 'Description' (Optional test case short description). A 'Variables' section is also present. The 'Conversation' section shows a JSON array of messages: a user message 'I like t oorder pasta' and a bot response 'I am really sorry, but it seems that what you asked for is not a choice on our menu.' A red box highlights the 'Run' button, with a red arrow pointing to it from the text 'Run single test case'.

Bot Tester | **Test Cases** | Test Run Results

+ Test Case | Run All Test Cases

Filter

Sort By | Display Name Ascending

OrderPasta

Page 1 of 1

Enabled

* Display Name | OrderPasta

* Name | OrderPasta

Description | Optional test case short description

? Variables

* Conversation

```
1 [
2   {
3     "source": "user",
4     "type": "text",
5     "payload": {
6       "message": "I like t oorder pasta"
7     }
8   },
9   {
10    "source": "bot",
11    "type": "text",
12    "payload": {
13      "message": "I am really sorry, but it seems that what you asked for is not a
choice on our menu."
14    }
15  },
16  {
17    "source": "user",
18    "type": "text",
19    "payload": {
20      "message": "I like to order pasta"
21    }
22  }
23 ]
```

Run single test case → Run

Executing a test case for a skill

Testing Alfredo Pasta Skill

Bot Tester

Test Cases

Test Run Results

+ Test Case

Run All Test Cases

Filter

Sort By

Display Name Ascending

Full Entity Extraction Flow

NLP flow

Order From Menu Flow

Show Menu Flow

Skip menu flow

Welcome Flow

Enabled

* Display Name

Welcome Flow

* Name

WelcomeFlow

Description

Optional test case short description

Variables

Conversation

1

[

2

{

3

"source": "user",

4

"type": "text",

5

"payload": {

6

"message": "Hi"

7

},

8

},

9

{

10

"source": "bot",

11

"type": "text",

12

"payload": {

13

"message": "Hi. I am a bot

14

to order pasta. You can type 'I like

15

to order pasta' to see a menu"

16

}

17

}

18

]

19

}

Submit Test Run Job for Welcome Flow

The currently selected test case will be run.

Test Run Job Name *

Welcome Flow - Mon, 12/9/2019 08:47

Submit

Testing Alfredo Pasta Skill

Bot Tester

Test Cases

Test Run Results

Filter

Sort By

Test Run Started Descending

Welcome Flow - Mon, 12/9/2019 ...

Page 1 of 1 (1 of 1 items)

1

Test Run Results

(Started 2019-12-09, 8:47:57)

1

All

1

Passed

Filter

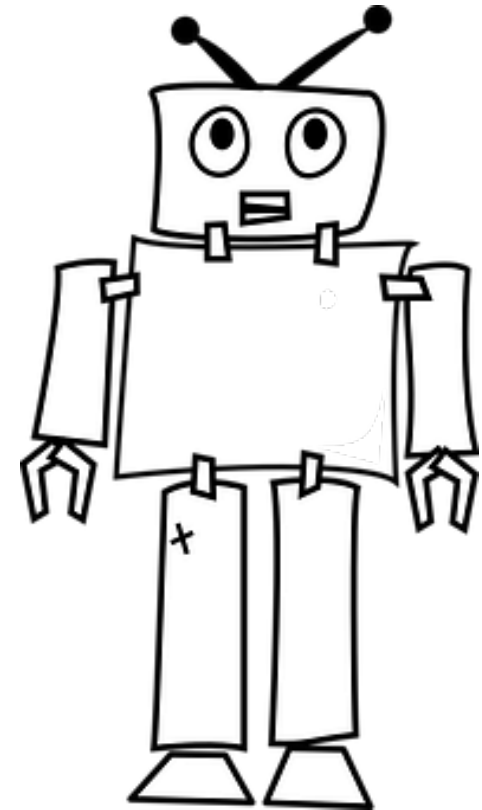
✓ WelcomeFlow

(Elapsed Time: 1 seconds)



The **execution** of a test case **stops** at the **first utterance that does not produce the expected bot response**.

If so, the entire test case is marked as failed with a message indicating the problem.



Test case created from a conversation

The screenshot displays the Oracle Bot Tester interface with the 'Test Cases' tab selected. On the left, there are buttons for '+ Test Case' and 'Run All Test Cases', a filter input, and a 'Sort By' dropdown set to 'Display Name Ascending'. A list of test cases shows 'OrderPasta' selected. The main form for the test case 'OrderPasta' includes an 'Enabled' toggle, a 'Run' button, and fields for 'Display Name', 'Name', and 'Description'. A 'Variables' link is highlighted with a red box and an arrow pointing to a red text annotation. The 'Conversation' field contains a JSON array of messages.

Bot Tester | **Test Cases** | Test Run Results

+ Test Case | Run All Test Cases

Filter

Sort By | Display Name Ascending

OrderPasta

Page 1 of 1

Enabled ☒

Run

* Display Name | OrderPasta

* Name | OrderPasta

Description | Optional test case short description

Variables ← List of place holder variables in messages (later more on this)

* Conversation

```
1 [
2   {
3     "source": "user",
4     "type": "text",
5     "payload": {
6       "message": "I like t oorder pasta"
7     }
8   },
9   {
10    "source": "bot",
11    "type": "text",
12    "payload": {
13      "message": "I am really sorry, but it seems that what you asked for is not a
choice on our menu."
14    }
15  },
16  {
17    "source": "user",
18    "type": "text",
19    "payload": {
20      "message": "I like to order pasta"
21    }
22  }
23 ]
```

Test case created from a conversation

Bot Tester

Test Cases

Test Run Results

+ Test Case

Run All Test Cases

Filter

Sort By

Display Name Ascending

OrderPasta

Page 1 of 1

Enabled

Run

* Display Name

OrderPasta

* Name

OrderPasta

Description

Optional test case short description

? Variables

* Conversation

```
1 [
2   {
3     "source": "user",
4     "type": "text",
5     "payload": {
6       "message": "I like t oorder pasta"
7     }
8   },
9   {
10    "source": "bot",
11    "type": "text",
12    "payload": {
13      "message": "I am really sorry, but it seems that what you asked for is not a
choice on our menu."
14    }
15  },
16  {
17    "source": "user",
18    "type": "text",
19    "payload": {
20      "message": "I like to order pasta"
21    }
22  }
23 ]
```

JSON test script. You can edit the script if needed. →

Test suite

"I like to order a pasta with bacon, garlic and oil"

"I like to order pasta"

"Please show the menu"

"Please show the menu"

"I like to order a pasta with bacon"

"Hi"

Testing Alfredo Pasta Skill

Bot Tester

Test Cases

Test Run Results

+ Test Case

Run All Test Cases

Filter



Sort By

Display Name Ascending



Full Entity Extraction Flow



NLP flow



Order From Menu Flow



Show Menu Flow



Skip menu flow



Welcome Flow



Page 1 of 1



Executing a test suite

ORACLE Digital Assistant

< Skills • Alfredo Pasta **DRAFT • 1.1**

Run Tests Validate

+ Components ? Theme Default

```
1 #metadata: information about the
2 # platformVersion: the version o was written to work with
3 metadata:
4   platformVersion: "1.1"
5 main: true
6 name: AlfredoDynamicPastas
7 #context: Define the variables wh flow here.
```

Submit Test Run Job for Alfredo Pasta 1.1

All enabled test cases in the skill bot will be run.

Test Run Job Name *

Alfredo Pasta 1.1 - Mon, 12/9/2019 08:54

Submit

Testing Alfredo Pasta Skill

Bot Tester Test Cases Test Run Results

Filter

Sort By Test Run Started Descending

Alfredo Pasta 1.1 - Mon, 12/9/2019 ...

Welcome Flow - Mon, 12/9/2019 ...

Page 1 of 1 (1-2 of 2 items)

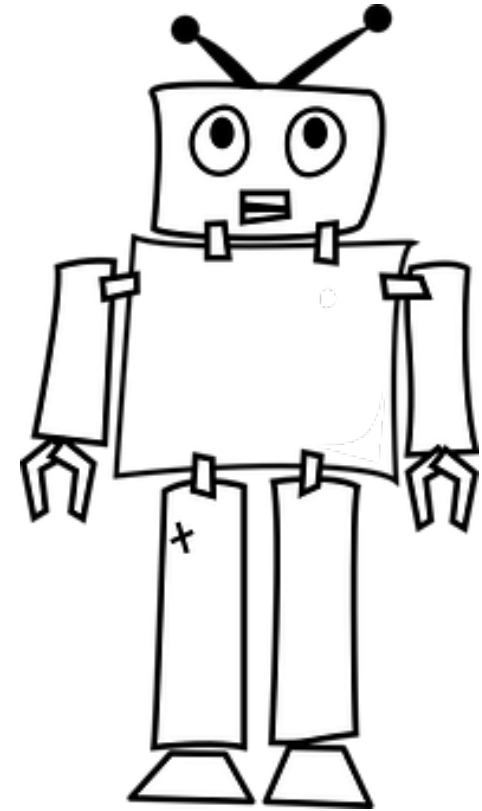
Test Run Results (Started 2019-12-09, 8:54:54 am, Completed 2019-12-09, 8:54:59 am) Last Refreshed a few seconds ago

6 All 6 Passed 0 Failed 0 In Progress

Filter

- ✓ Skipmenuflow (Elapsed Time: 0 seconds) Download Log
- ✓ WelcomeFlow (Elapsed Time: 0 seconds) Download Log
- ✓ NLPflow (Elapsed Time: 1 seconds) Download Log
- ✓ ShowMenuFlow (Elapsed Time: 1 seconds) Download Log
- ✓ OrderFromMenuFlow (Elapsed Time: 2 seconds) Download Log
- ✓ FullEntityExtractionFlow (Elapsed Time: 2 seconds) Download Log

A test case **does not need to be a complete conversation path.** You can save partial conversations as a test case



Summary of test cases

- Only exists for skills yet
- Saved with the skill and all its variants
 - version, clone, extension
- Conversation scripts are formatted in JSON
- Test can be run for individual test cases or the whole suite

The image shows two side-by-side screenshots of the Oracle APEX interface for testing skills. The left screenshot is titled 'Testing Alfredo Pasta Skill' and the right is 'Testing Alfredo Pasta Clone Skill'. Both have tabs for 'Bot Tester', 'Test Cases', and 'Test Run Results'. The 'Test Cases' tab is active in both. Each has a '+ Test Case' button and a 'Run All Test Cases' button. Below these is a 'Filter' search bar and a 'Sort By' dropdown set to 'Display Name Ascending'. A table of test cases is shown in both, with the first row 'Full Entity Extraction Flow' highlighted in blue. A red arrow labeled 'cloned' points from the highlighted row in the left screenshot to the highlighted row in the right screenshot. The right screenshot also shows a pagination bar at the bottom indicating 'Page 1 of 1'.

Sort By	Display Name Ascending
Full Entity Extraction Flow	×
NLP flow	×
Order From Menu Flow	×
Show Menu Flow	×
Skip menu flow	×
Welcome Flow	×

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- 3 Handling dynamic content in bot responses**
- 4 Updating failed test cases

Dynamic content in a bot response

```
33 printMessage:
34   component: "System.Output"
35   properties:
36     text: "${today.value} ${greeting.value}
37           ${name.value}"
38   transitions:
39     return: "done"
40
```

What is your name?

Frank

Dec 6, 2019 12:31:45 PM Hello! Frank

- Test case fails if bot response contains changing values
 - Example: current date

1

All

0

Passed

1

Failed

Filter

FullConversation (Elapsed Time: 1 seconds)

Json Pointer:
/5/payload/message

Expected Value:
Dec 6, 2019 12:31:45 PM Hello! Frank

Actual Value:
Dec 6, 2019 12:36:41 PM Hello! Frank

Handling dynamic content when testing bot responses

```
33 printMessage:
34   component: "System.Output"
35   properties:
36     text: "${today.value} ${greeting.value}
37           ${name.value}"
38   transitions:
39     return: "done"
```

Variables SYSTEM_BOT_ID, TODAY

Conversation

```
79   "payload": {
80     "message": "What is your name?"
81   },
82   {
83     "source": "user",
84     "type": "text",
85     "payload": {
86       "message": "Frank"
87     }
88   },
89   {
90     "source": "bot",
91     "type": "text",
92     "payload": {
93       "message": "${TODAY} Hello! Frank"
94     }
95   }
96 }
```

- Replace part of message that changes with a placeholder – E.g. `${MY_VAR}`
- Placeholder variable is ignored when running a test case

1 All	1 Passed	0 Failed
----------	-------------	-------------

Filter

✓ FullConversation (Elapsed Time: 1 seconds)

Page 1 of 1 (1 of 1 items) < 1 >

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Updating failed test cases

- Test cases may fail because the skill has been changed
 - E.g. developer changed the bot response for a user message
- You can update test cases from the test case result page
 - Press **Apply Actual** button to update the test case with the actual bot response
- Not a solution for test cases that contain date / time information
 - Use placeholder variables instead

The screenshot displays the Oracle APEX test case results page for a test case named 'WelcomeFlow'. At the top, there are four summary boxes: 'All' (0), 'Passed' (0), 'Failed' (0), and 'In Progress' (1). Below these is a 'Filter' input field. The main content area shows a list of test case results. The first result is for 'WelcomeFlow' (Elapsed Time: 2 seconds), which is marked as failed with a red exclamation mark icon. To the right of this result is a 'Download Log' link and an 'Apply Actual' button, which is highlighted with a black arrow. Below the result details, there is a pagination bar showing 'Page 1 of 1 (1 of 1 items)'. The second result is also for 'WelcomeFlow' (Elapsed Time: 2 seconds), marked as failed. To its right is another 'Download Log' link and an 'Apply Actual' button. A confirmation dialog box is overlaid on the page, asking 'Are you sure you want to update WelcomeFlow test case with actual value'. It also shows a countdown timer 'Canceling this request in (secs) 12' and a 'Yes' button, which is highlighted with a black arrow. At the bottom of the page, there is a green banner with a checkmark icon and the text 'WelcomeFlow test case has been successfully updated'.

0 All 0 Passed 0 Failed 1 In Progress

Filter

WelcomeFlow (Elapsed Time: 2 seconds) Download Log

Json Pointer: /1/payload/message

Expected Value: Hi. I am a bot to order pasta. You can type 'I like to order pasta' for me to show the menu

Actual Value: Hi. I am a bot to order pasta. You can type 'I like to order pasta' to see a menu

Page 1 of 1 (1 of 1 items) < 1 >

WelcomeFlow (Elapsed Time: 2 seconds) Download Log

Json Pointer: /1/payload/message

Expected Value: Hi. I am a bot to order pasta. You can type 'I like to order pasta' for me to show the menu

Actual Value: Hi. I am a bot to order pasta. You can type 'I like to order pasta' to see a menu

Are you sure you want to update WelcomeFlow test case with actual value

Canceling this request in (secs) 12

Page 1 of 1 (1 of 1 items) < 1 >

✓ WelcomeFlow test case has been successfully updated

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