

# Connected Field Service IoT Central

## Guide

# Developer



# Greg Degruy

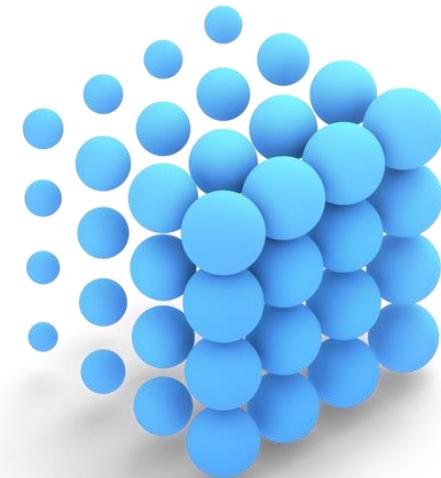


Software Engineer and Architect

{

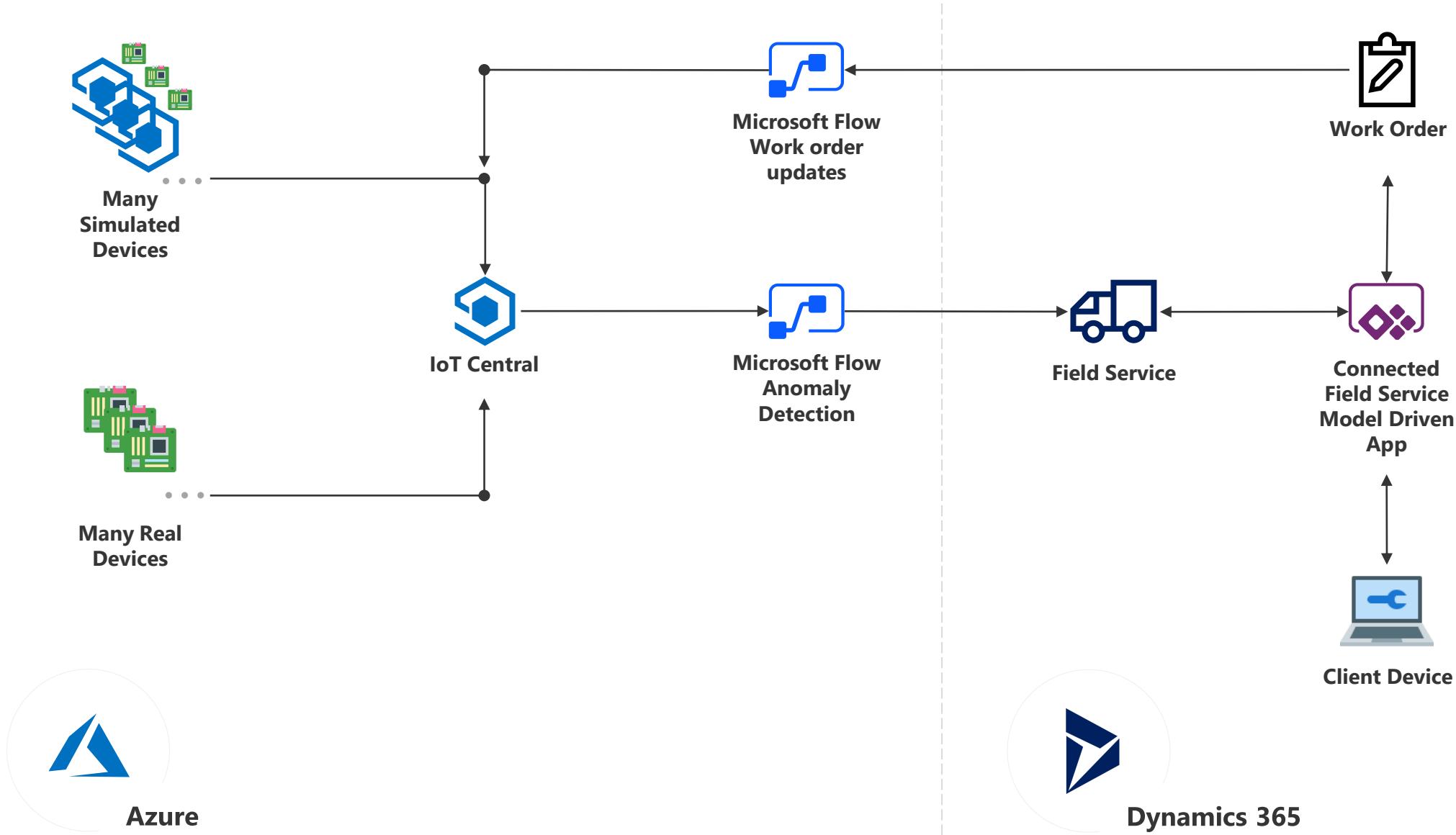
[github.com/gregdegruy](https://github.com/gregdegruy)

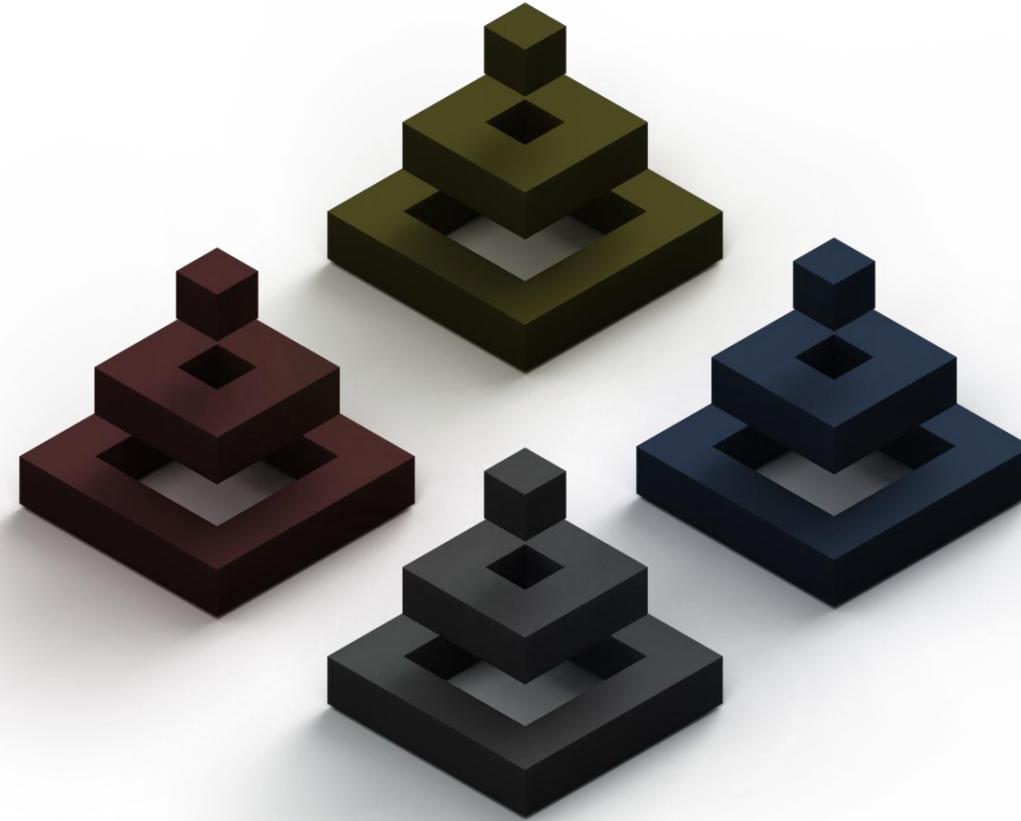
}



# Connected Field Service IoT Central { A bi-directional data integration }

CONNECTED FIELD SERVICE





# Dynamics 365 to IoT Central

Send work order updates from Dynamics 365 to IoT Central

# Content

- 15 minutes
- You'll learn how to:
  - Create a Microsoft Flow template directly from Dynamics 365
  - Automatically capture Work Order Service Information data in IoT Central



**Dynamics 365  
Field Service**



**Azure  
IoT Central**

# Connected Device



IoT Devices are registered automatically in Dynamics once an Alert is captured.

1. From the CFS dashboard select the menu icon if not open already.
2. Select Devices from Connected Devices.
3. You'll now see a table of all of your Active IoT Devices. Like my device, it's okay if the Connection state is listed as Disconnected, this does not effect our scenario in any way. Select your device.



## Connected Devices

- Devices
- Commands
- Customer Assets

	Name	Registration St...	Cat...	Acco...	Created On	Connection State	
	Fuel Pump	Registered	Fuel pump Ser	Adventure Work	8/5/2018 11:46 ...	Disconnected	
	Gachapon Capsule Toy Machine-1	Registered	---	---	4/18/2019 2:06 ...	Disconnected	
	Refrigerated Vending M...	Registered	Refrigerated V	Active Transport	8/27/2018 3:48 ...	Disconnected	
	Refrigerator 1	Registered	---	---	3/7/2019 1:01 PM	Disconnected	
	Refrigerator 2	Registered	---	---	3/7/2019 1:01 PM	Disconnected	
	Refrigerator 3	Registered	---	---	3/7/2019 1:00 PM	Disconnected	

# Customer Account

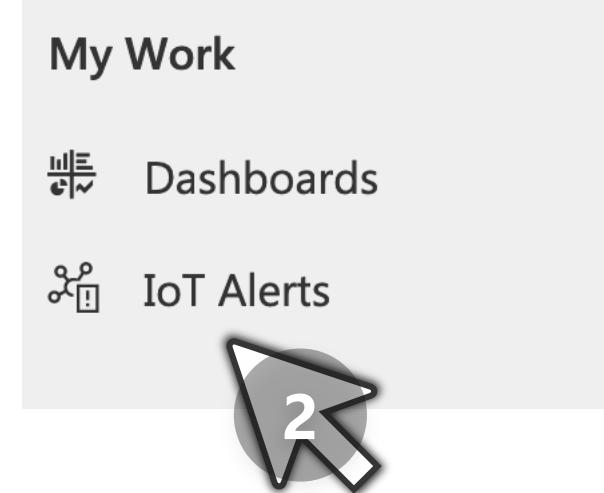
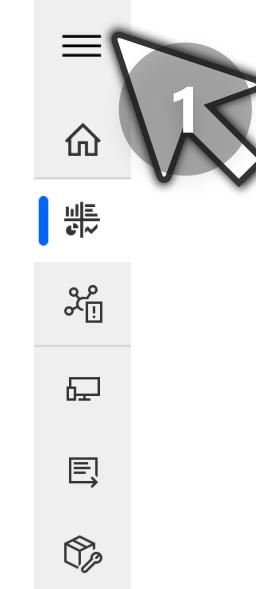
This will be important later in our Case creation. We need to make sure our IoT device is associated with our device.

1. Search for and select Active Transport Inc. one of our CFS sample data accounts, this verifies that the CFS sample data was successfully installed!
2. Save... all the way down there...

The screenshot shows the Microsoft Power BI Device Management interface. At the top, there's a search bar for 'Account' with 'Look for Account' and a magnifying glass icon. Below it is a dropdown menu showing three entries: 'A. Datum Corporation (sample) someone9@example.com', 'Active Transport Inc. 465-555-0156', and 'Adventure Works (sample) someone3@example.com'. A large hand cursor icon with the number '1' is pointing at the 'Active Transport Inc.' entry. To the right of the dropdown is a section for 'Device Settings' with a '+ New' button and a 'Change View' button. Below this is a summary card for an 'IOT DEVICE' named 'Gachapon Capsule Toy Machine-1'. The card includes fields for 'Name' (Gachapon Capsule Toy Machine-1), 'Account' (Active Transport Inc.), 'Category' (---), 'Time Zone' (---), and 'Device ID' (1oio6xt). It also has tabs for 'General', 'Device Data History', 'Commands', 'Registration History', and 'Related'. On the right side of the card, there's a section for 'Connected Device Readings' with a note to 'Add a Power BI tile for the connected device.' and a small icon. At the bottom of the card, there's a 'Device Settings' section with a 'SWITCH TO JSON VIEW' button. At the very bottom of the page, there are navigation buttons for 'Active' (with a checkmark), 'Save' (with a document icon), and 'Cancel' (with a cross icon).

# IoT Alerts

1. Select the menu bars to expand our menu if you need to.
2. IoT Alerts.
3. Select your top IoT Alert for your simulated device we've been using for all our work so far. Mine is called *Gachapon Capsule Toy Machine-1*.



✓	Description	Alert Type	Alert Ti... ↓	Alert Stat...	Device	⋮
	High balance from IoT Central application: Sample Guide 2g8r7drx3iu	Anomaly	4/18/2019 2:5...	Active	Gachapon Capsule Toy Machine-1	⋮
	High balance from IoT Central application: Sample Guide 2g8r7drx3iu	Anomaly	4/18/2019 2:4...	Active	Gachapon Capsule Toy Machine-1	⋮
	High balance from IoT Central application: Sample Guide 2g8r7drx3iu	Anomaly	4/18/2019 2:4...	Active	Gachapon Capsule Toy Machine-1	⋮

# Work Orders

Our goal is to create a work order so we can take advantage of prebuilt flow templates to send this information to IoT Central.

1. When you click on the red target for our First Stage called *Created*
2. A stage menu opens that allows you to move to the next stage. select Next Stage
3. In the second menu that opens, we have an option to perform a case quick create. Create.

The screenshot shows a Microsoft Power Platform canvas application interface. At the top, there's a header bar with the title "IOT ALERT" and a subtitle "High balance from IoT Central appli...". On the right side of the header, it says "Owner" followed by a user icon and "Greg Degruy". Below the header, there's a navigation bar with several buttons: "CFS - IoT Alert Process Fl..." (highlighted in red), "Created", "Create Case", "Create Work Order", "Schedule Work Order", and a "More" button represented by a right-pointing arrow.

The main area has three tabs: "General" (which is selected and underlined in blue), "Commands", and "Related". Under the "General" tab, there are several input fields:

- Description: \* High balance from IoT Central application: Sa...
- Alert Type: Anomaly
- Alert Token: fc46e252-e570-4467-9194-53b2a6d47a71
- Alert Time: 4/18/2019 (calendar icon) and 2:51 PM (clock icon)
- Alert Status: Active

To the right of these fields is a "Timeline" section with a note input field and a message "No records to show."

On the far right, there's a "Connected Device Readings" section with a note "Add a Power BI tile for the connected device." and a "Power BI" icon.

At the bottom of the screen, there's a "Next Stage" dropdown menu with the value "Select Case". Below it, a message says "No records found." and there are "Create" and "Close" buttons.

Three large, semi-transparent numbered callouts are overlaid on the interface:

- 1**: Points to the red "Created" button in the navigation bar.
- 2**: Points to the "Next Stage" button in the "Select Case" dropdown.
- 3**: Points to the "Create" button at the bottom of the "Select Case" menu.

# Case Quick Create

All of the required Case information is populated for use, including the Customer

1. Add a Case Title if none is provided, like "High balance alert from toy machine 1".
2. Save and close.

## Quick Create: Case



### Case Details

Customer	*  Active Transport Inc.
Case Title	* High balance alert from toy machine 1
Subject	---
Case Type	---
Contact	---
Assign to Others	*  Greg Degruy
Parent Case	---
IoT Alert	High balance from IoT Central ap...

### Other Details

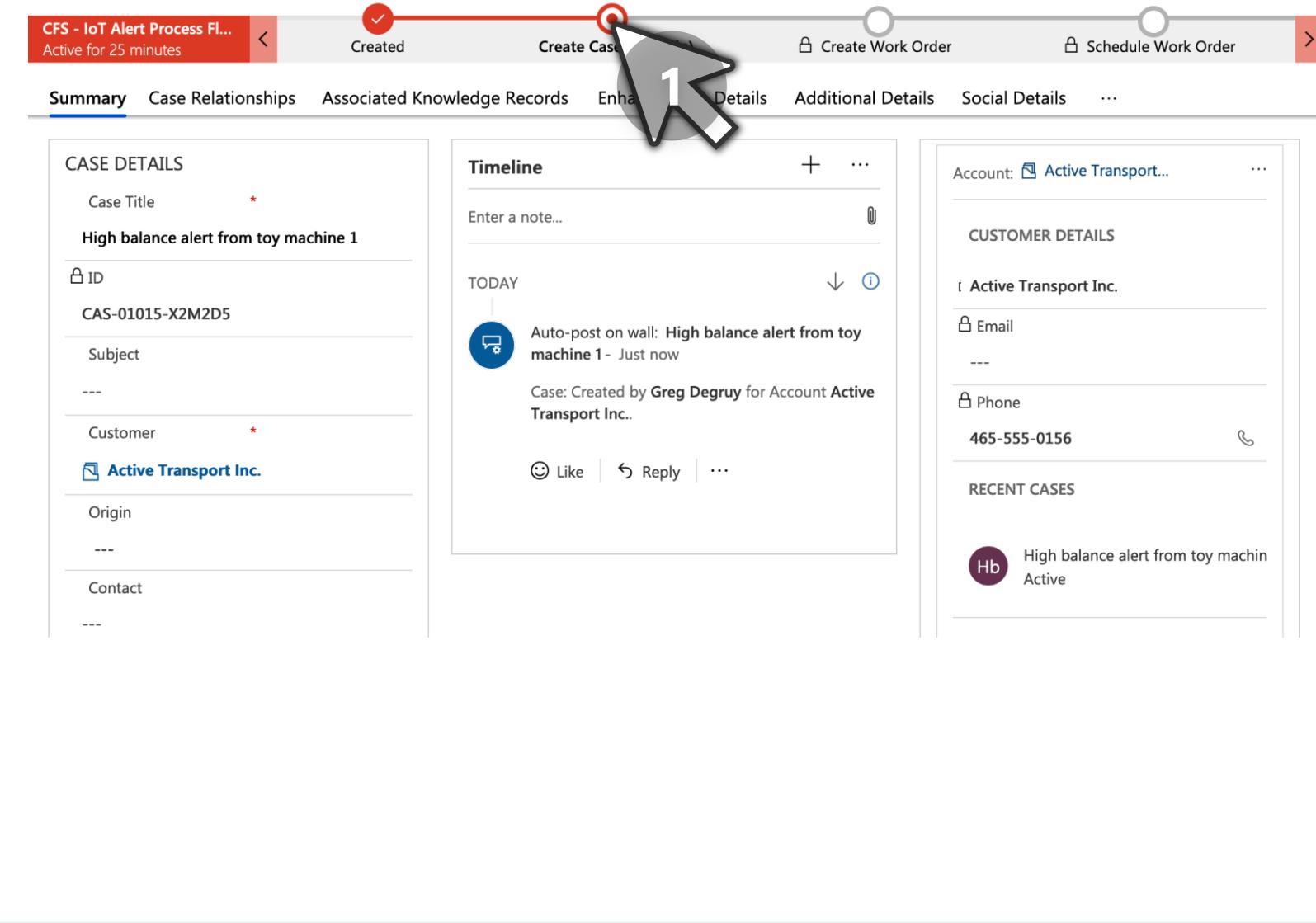
Origin	---
Product	---
Entitlement	---
First Response By	

  
Save and Close  
Cancel

# Next stage

You'll now be navigated to your new Case's View

1. Select Create Case red target to open the next stage menu.



# Incident create

1. Incident Type lookup.
2. + New.
3. Give a relevant Incident name for your device, in my case Toy Machine Balance Inspection.
4. Save & Close.

The screenshot shows the 'Incident create' screen in the Microsoft Dynamics 365 Work Order Sync to IoT Central application. The top navigation bar includes 'Save' and 'Save & Close' buttons. A large circular icon with a 'W' symbol is present above the incident type field. The main area has tabs for 'General', 'Details', 'Service Tasks', 'Products', 'Services', and 'Notes'. The 'General' tab is selected. The 'Owner' field is set to 'Greg Degruy'. The 'Name' field contains 'Toy Machine Balance Inspection'. The 'Description' field is empty. On the right, there is a note-taking interface with a pencil icon and a '3' indicating three notes. In the center, there is a search interface for 'Incident Type' with a magnifying glass icon and a '1' indicating one result. The results list includes 'Banana Refrigerator attention 30', 'Bill acceptor malfunction 35', 'Camera Down 120', and 'Cash Collector Drawer Full'. At the bottom, there are 'New' and 'Change View' buttons, and a large number '2' is overlaid on the bottom center of the screen.

INCIDENT TYPE  
New Incident Type

General Details Service Tasks Products Services Notes

Owner \* Greg Degruy

Name \* Toy Machine Balance Inspection

Description ---

Active for 12 minutes

Case Title \* High balance ale...

Find Customer \* Active Transp...

Incident Type Look for Inci...

Next Step

Case: Created by

Like

1

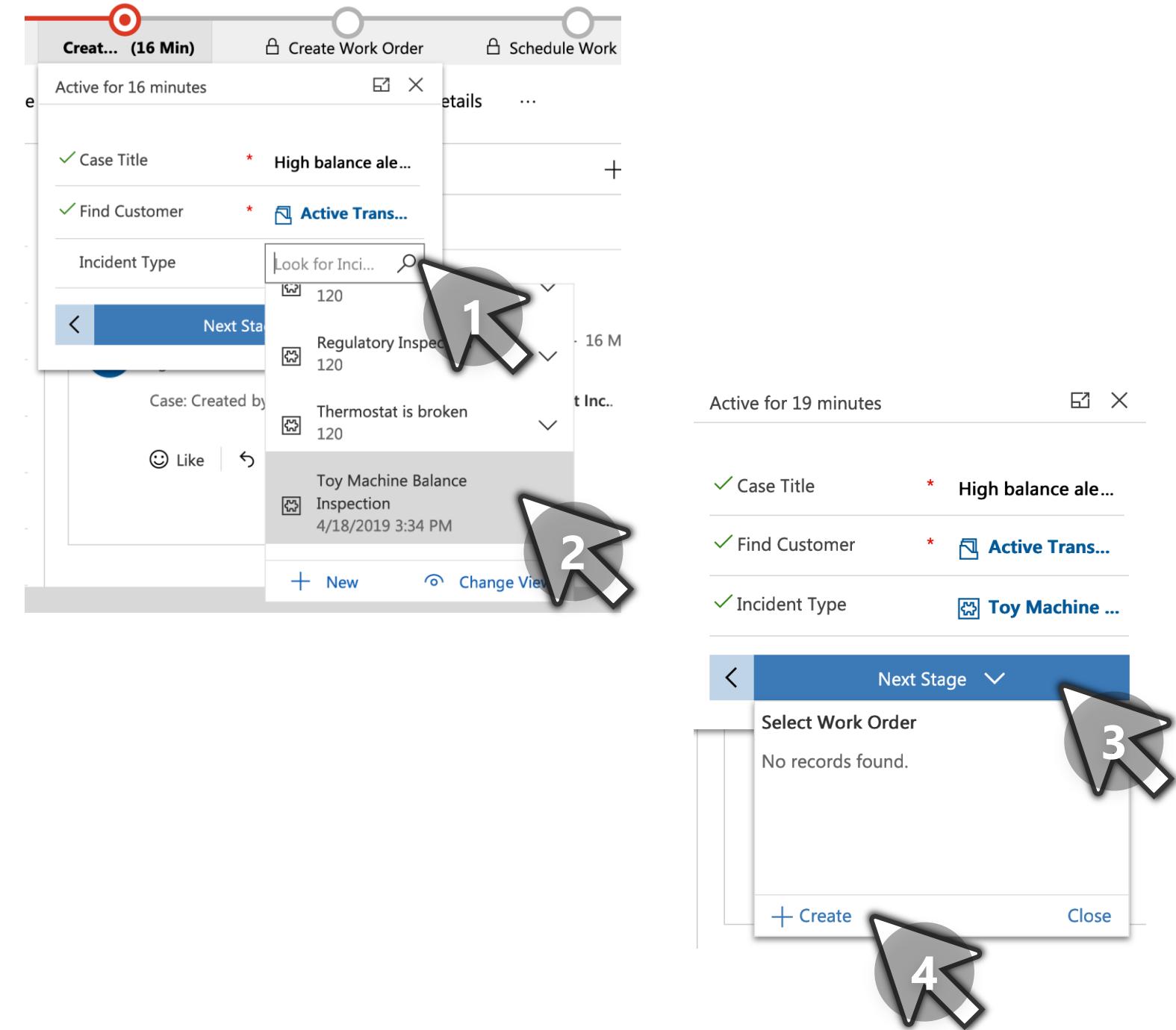
2

3

4

# Incident create

1. You should now be back on the Case page. Select the search icon for Incident Type lookup.
2. Select the Incident you just created.
3. Next Stage.
4. + Create.



# Work Order quick create

1. Select the Work Order Summary field. Add a similar summary "High balance alert from IoT Central App Sample Guide 2g8r7drx3iu ". It's good to be as descriptive as possible and include the IoT Central Application name and IoT as I have. This will help better scale our ability to identify work orders as the amount grows.
2. Select , in my case Toy Machine Balance Inspection.
3. Add a Primary Incident Description, in my case I added Balance needs check up and adjustment.
4. Select the Inspection Work Order Type.
5. Add a 1 hour Estimated duration.
6. Scroll down the quick create form to find Price List. Select Standard US Dollar.
7. Save and Close.

Quick Create: Work Order X

**CUSTOMER INFORMATION**

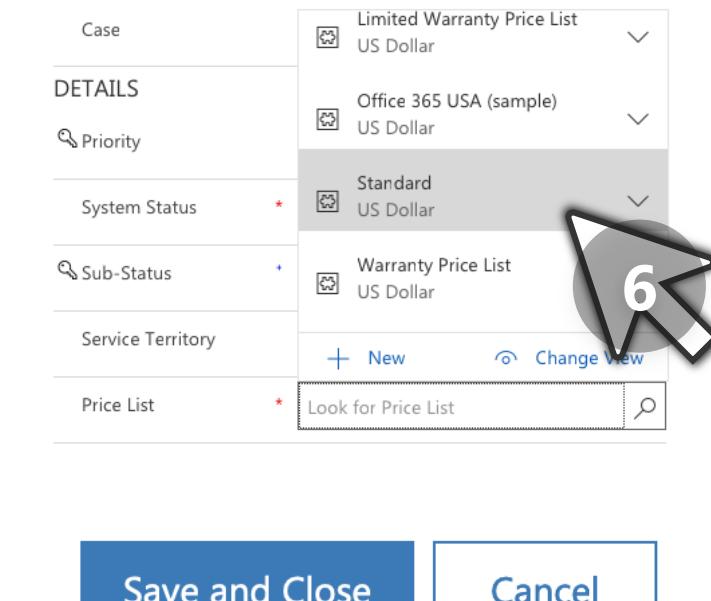
Work Order Summary	---	
Service Account *	Active Transport Inc.	
Billing Account	Active Transport Inc.	
Reported By Contact	---	

**INCIDENT INFORMATION**

Primary Incident Type	---	
Primary Incident Description	---	
Primary Incident Customer Asset	---	
Primary Incident Estimated Duration	---	
Work Order Type *	---	
IoT Alert	High balance alert from IoT Central app...	
Case	High balance alert from toy machi...	

**DETAILS**

Case	Limited Warranty Price List US Dollar
System Status *	Office 365 USA (sample) US Dollar
Sub-Status	Standard US Dollar
Service Territory	Warranty Price List US Dollar
Price List *	+ New    Change View Look for Price List



Save and Close

Cancel



# Work Order

You'll now be navigated to the page of your new Work Order

1. Select the Settings tab

The screenshot shows the Microsoft Dynamics 365 Work Order page for Work Order 00005. At the top, there is a navigation bar with several status indicators: 'CFS - IoT Alert Process Fl...' (Active for 51 minutes), 'Created' (with a checkmark), 'Create Case' (with a checkmark), 'Create Work Order (< 1 Min)' (with a red circle), 'Schedule Work Order' (with a grey circle), and 'Close Work Order' (with a grey circle). Below the navigation bar, there is a tabs menu with 'Summary' (underlined in blue) and other tabs: 'Settings', 'Record Log', 'Service Tasks', 'Products', 'Services', 'Address', 'Location', and 'Related'. A large cursor icon with the number '1' is positioned over the 'Settings' tab. The main content area is divided into several sections: 'GENERAL' (Work Order Number: 00005, Service Account: Active Tran..., Billing Account: Active Tran..., System Status: Open - Unscheduled, Sub>Status: ---, Work Order Summary: High balance alert from IoT Central App Sample Guide 2020r7drv2iii...); 'Timeline' (No records to show); 'CUSTOMER DETAIL' (Primary Contact: ---, Email: ---, Address Phone: ---); 'INCIDENTS' (Toy Machine Balance Inspection 00005, Toy Machine Balance Inspection); and 'BOOKINGS'.

# Work Order Settings

1. Enter a 2pm starting time in Time Window Start. Dynamics enforces the format *hh:mm tt* so your time must like 2:00 PM
2. Select the Summary tab



*Time Window Start* is The earliest time you are willing to start the work order

*Time Window End* is The latest time you are willing to end the work order

The screenshot shows the 'Work Order Settings' page. At the top, there is a navigation bar with tabs: Summary, Settings (which is underlined in blue), Record Log, Service Tasks, Products, Services, Address, Location, and Related. Below the navigation bar, there are several settings fields:

- Work Order Type: Inspection (highlighted with a yellow star)
- Price List: Standard
- Priority: ---
- Work Location: Onsite
- Service Territory: ---
- Currency: US Dollar
- Instructions: ---
- Reported By Contact: ---

On the right side of the page, there is a 'PREFERENCES' section with the following fields:

- Time From Promised: ---
- Time To Promised: ---
- Date Window Start: ---
- Date Window End: ---
- Time Window Start: 2:00 PM (highlighted with a yellow star)
- Time Window End: ---
- Time Group: ---

A large gray mouse cursor with the number '1' is positioned over the 'Time Window Start' field. A second large gray mouse cursor with the number '2' is positioned over the 'Time Window End' field.

# Work Order Summary

1. Scroll down the Primary Incident section. Select the link to the IoT Alert associated with our new Work order by double clicking on it, in my case it's called High balance from IoT Central applicatio...

Summary   Settings   Record Log   Service Tasks   Products   Services   Address   Location   Related

**PRIMARY INCIDENT**

Primary Incident Type  
 **Toy Machine Balance Inspection**

Primary Incident Desc...  
**Balance needs check up and adjustment**

Primary Incident Esti...  
**1 hour**

Primary Incident Cust...  
---

IoT Alert  
 **High balance from IoT Central applicatio...**



# Related

Now you're back on the IoT Alert page

1. Related.
2. Work Orders.

The screenshot shows the Microsoft Power BI IoT Alert page for an alert titled "High balance from IoT Central appl...". The alert is active for 1 hour and is part of the "CFS - IoT Alert Process Fl..." process. The status bar indicates "Created", "Create Case", and "Create Work Order (12 Min)".

The "General" tab is selected. A context menu is open over the "Work Orders" section, with two large numbered arrows pointing to the "Work Orders" item in the list:

- 1. Points to the "Work Orders" item in the list.
- 2. Points to the "Work Orders" item in the list.

The "Work Orders" section shows the following details:

Description
High balance from IoT Central

Alert Type: Anomaly

Alert Token: fc46e252-e570-4467-9

Alert Time: 4/18/2019 2:51 PM

Alert Status: In Progress - Work Order Created

On the right side of the page, there are sections for "Connected Devices" and "Add a Power BI

# Create a FLow

1. The table containing our Work Order confirms it's successfully been tied to our IoT Alert. Select Create IoT Flows.
2. From the pop up window select When a work order is created in CFS, update IoT Central.



YOU CAN CREATE THESE IOT FLOWS FROM THE GENERAL TAB. JUST WANT TO EMPHASIZE THAT OUR WORK ORDER IS UNIQUELY TIED TO THIS PARTICULAR IOT ALERT.

**IOT ALERT**  
High balance from IoT Central appli...  
Read only

CFS - IoT Alert Process Fl... Active for 1 hour < Created Create Case Create Work Order (12 Min) Schedule Work Order >

General Commands Work Orders Related

Refresh Run Report Excel Templates Export Work Orders

Work Order Associated View Search for records

Work Order ... Service Account Work Order ... Created On Sub-Status System Status

00005 Active Transport Inc. Ins CFS Flow Templates  
Choose a template to start creating a flow.  
All # A B C D E F G H I J

1 - 1 of 1 (0 selected)

2

Create CFS alerts from IoT Central By Microsoft Used 32 times  
[Sample Contoso] - When a work order is created in CFS, update IoT Central By Microsoft  
[Sample Contoso] - When a technician is booked in CFS, update IoT Central By Microsoft  
[Sample Contoso] - When a device is created in CFS, update IoT Central By Microsoft

# Microsoft Flow

You should now be navigated to the Microsoft Flow website. [If you're not signed in on the top right of screen click Sign In.](#) Once signed in you should see the proper Flow creation page presented to you.



Be sure to sign in to IoT Central or Dynamics 365 if the accounts are not connected already.

When you select continue both accounts should have a green check mark.

1. You may need to optionally fix your connection by selecting the ellipse next to the broken account and clicking [Update](#) to sign in.
2. Continue.

[Sample Contoso] - Where to update

Dynamics 365 → Dynamics 365 and Azure IoT Central

This flow will connect to:

	Dynamics 365 <a href="#">View permissions</a>	grdegr@grdegr.onmicrosoft.com
	Azure IoT Central	grdegr@microsoft.com

Continue

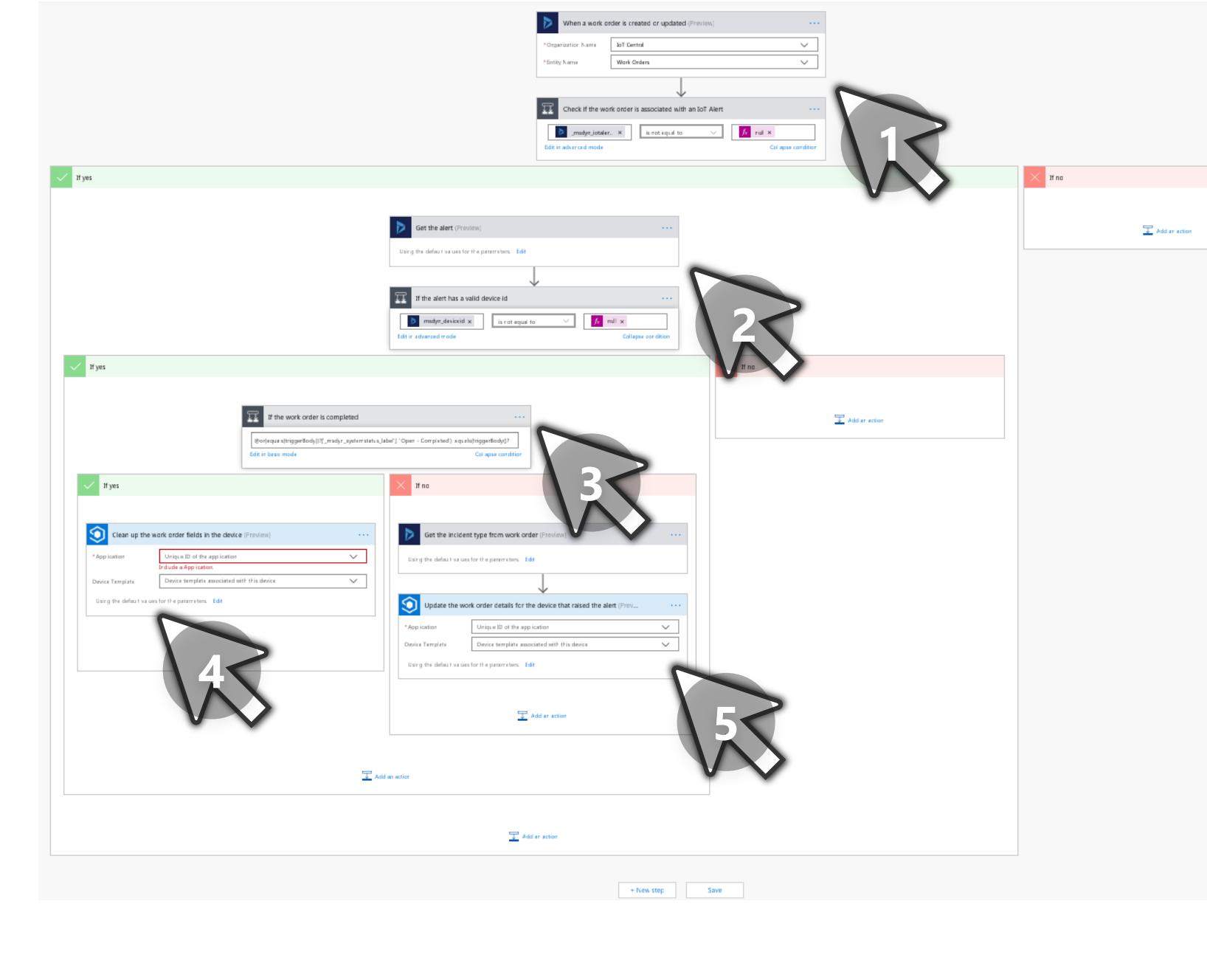
1. Invalid connection ...  
✓ grdegr@microsoft.com   
Update  
Add new connect...

2.

# BIG Flow

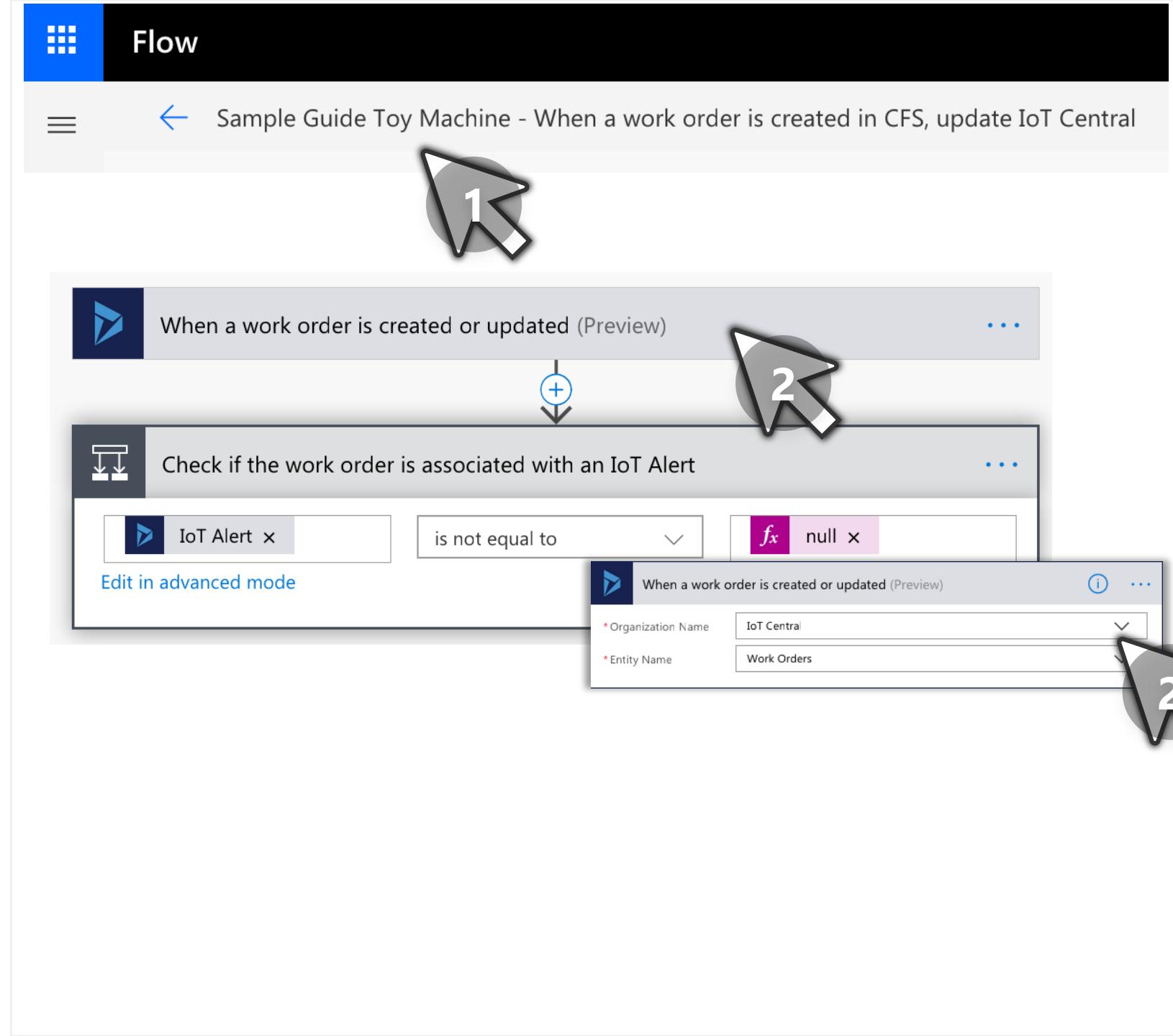
The flow logic for this template is more complex than the previous one's we've used, keep these important steps in mind.

1. Watch for Work Order CREATE or UPDATE in our Organization
2. Move into the core flow logic if the Work Order is associated with our IoT Alert. Then get the alert data.
3. Move deeper into the core logic if the alert has a device id then check if the work order is completed.
4. If the work order is completed, clean up the devices details Service Information in IoT Central.
5. If the work order is not completed, update the Service Information in IoT Central.



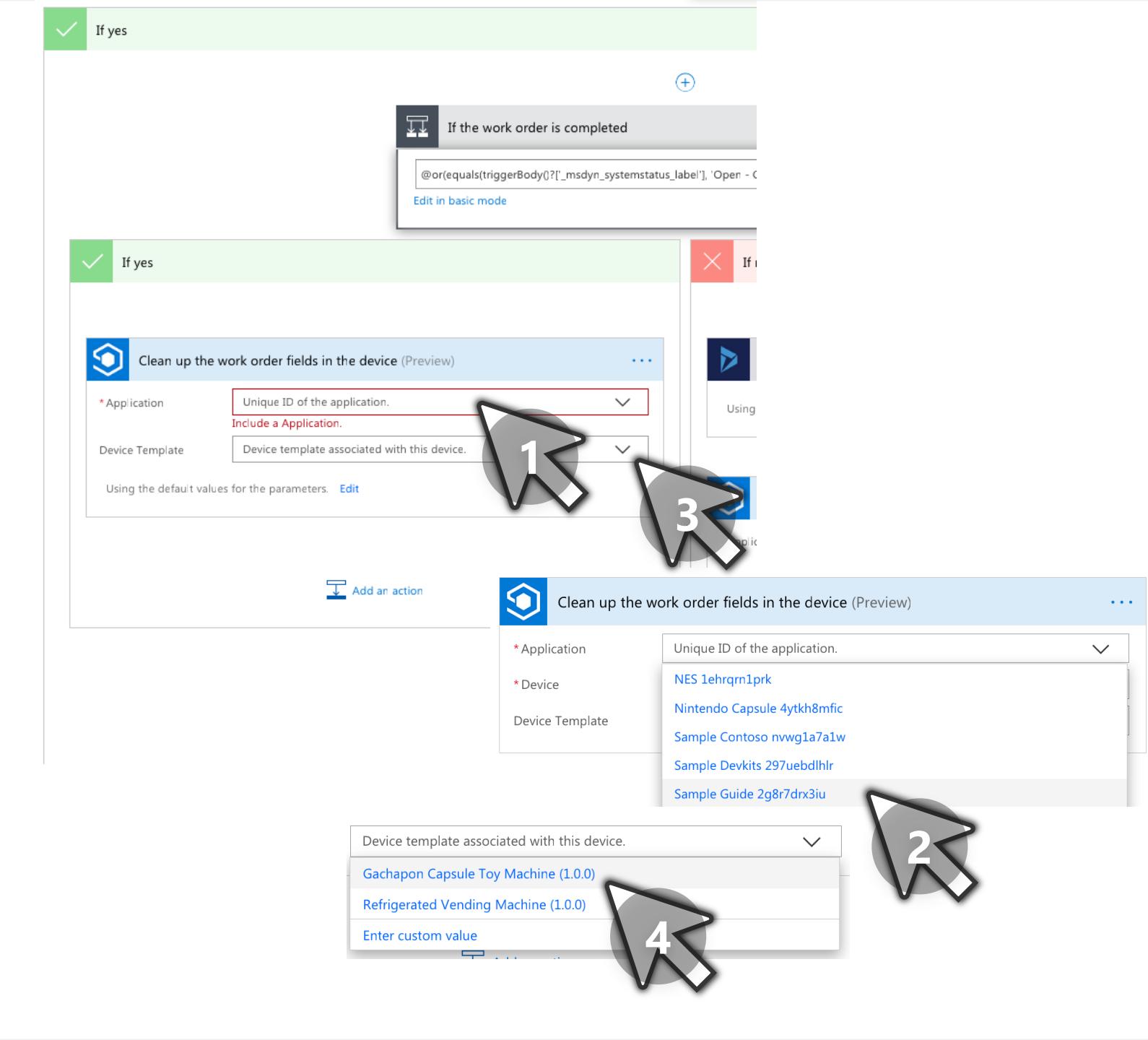
# Create or Update

1. Give your Flow a more unique name, like one that includes the application id *Toy Machine - When a work or updated order is created in CFS, update IoT Central*
2. The first part of our flow defined our organization to connect to and entity we'll be working with. Select it to verify the correct organization is listed if not select the drop down arrow to choose the correct one.



# If yes

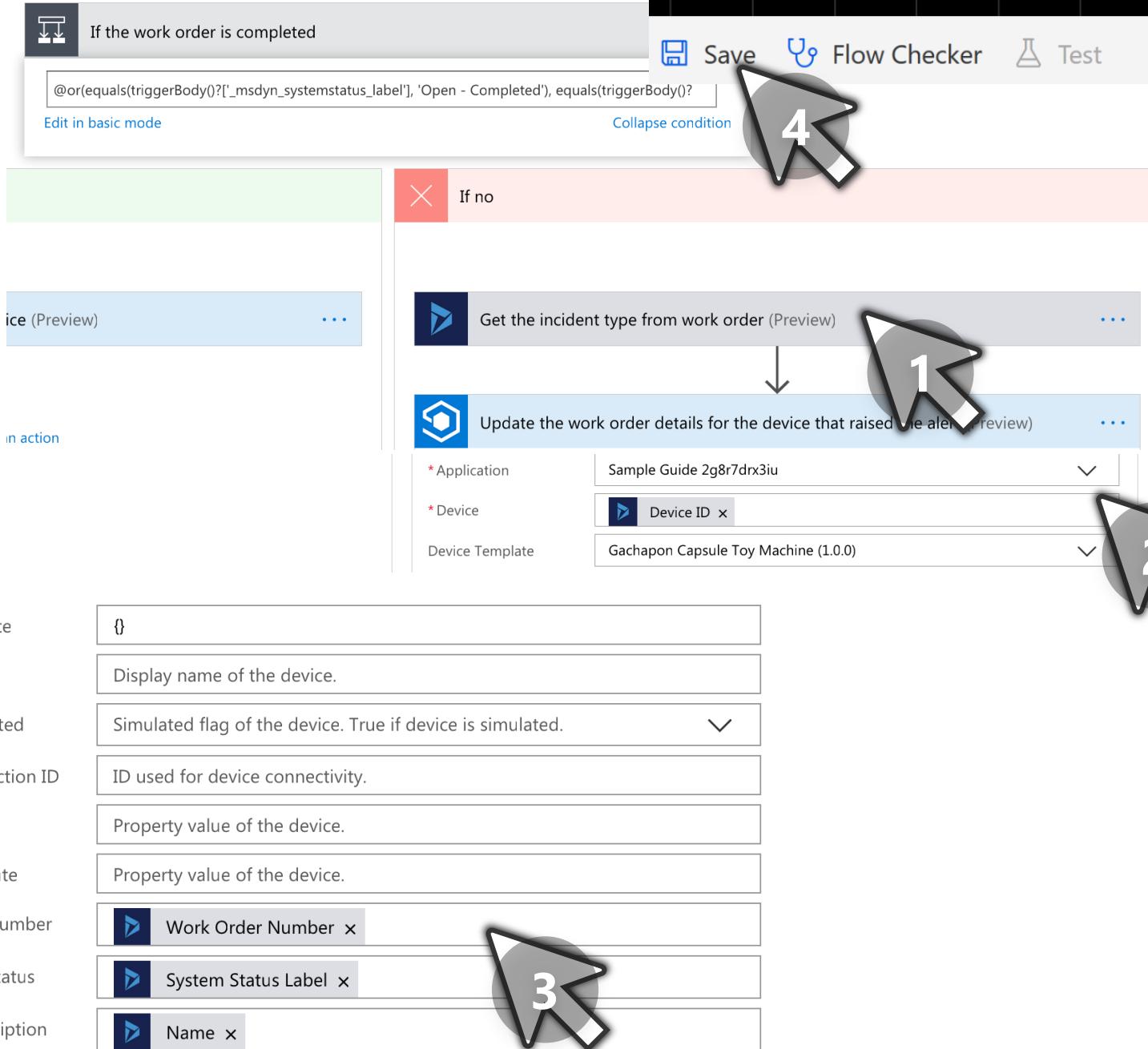
1. In the Inner most **If yes** condition, find the Clean up the work order fields in the device block. Select the Unique ID of the Application drop down
2. Select your Application name.
3. Select the Device template drop down.
4. Select your device template, in my case I choose *Connected Air Conditioner (1.0.0)*



# If no

- In the innermost **If no** condition, select the Get incident type from work order block. Verify your Dynamics 365 organization is selected.
- Select your Application ID and Device Template.
- Once selected a few of the key Work Order fields that we will send over to the Service Information in IoT Central will be auto populated for us.
- Save.

deviceTemplate  
Device Name  
Device Simulated  
Device Connection ID  
Location  
Last service date  
Work Order Number  
Work Order Status  
Incident Description



# Empty fields

1. Let's fill in the empty fields. Starting with Work Order Owner Id.
2. A Dynamics content window opens. All you need to do is search for the content you want to add, in this case Owner Id.  
*The content syntax is very specific, so you'll want to select Owner and not Owner Type.*
3. Select the Estimated Arrival Time field. Search for Time Window and select Time Window Start.



If the Blue Window get's annoying click hide

Last service date

Work Order Number

Work Order Status

Incident Description

Work Order Id

Estimated Arrival Time

Estimated Service Duration

Property value of the device.

Work Order Number x

System Status Label x

Name x

Property value of the device.

Property value of the device.

Property value of the device.

Add dynamic content +

1

Get the incident type from work order

Owner

Owner Type

Get the alert

Owner

Owner Type

2

Add dynamic content from the apps and connectors Hide used in this flow.

DYNAMIC CONTENT Expression

Owner Id

Add an action

3

Add dynamic content from the apps and connectors Hide used in this flow.

DYNAMIC CONTENT Expression

Time Window

When a work order is created or updated

Time Window End

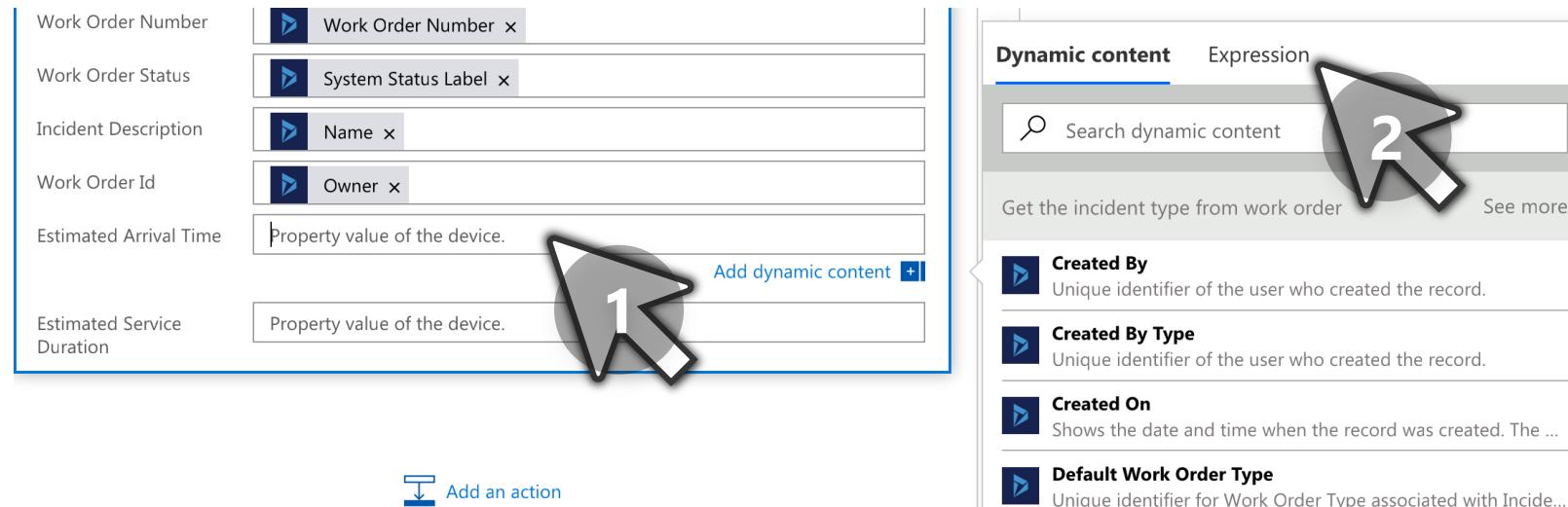
Time Window Start

4



# Functions

1. Select the empty Estimated Arrival Time field.
2. The Dynamic content window will open, but this time we want to select the Expression tab
3. Paste this code into the *f(x)* field  
**`div(int(triggerBody())?['msdyn_primaryincidentestimatedduration'], 60)`** then select. We need a function to account for the time format, hours, that IoT Central expects. So we divide by 60.
4. OK



Work Order Number

Work Order Status

Incident Description

Work Order Id

Estimated Arrival Time  Property value of the device.

Estimated Service Duration  Property value of the device.

Add dynamic content

Add an action

**Dynamic content** Expression

Search dynamic content

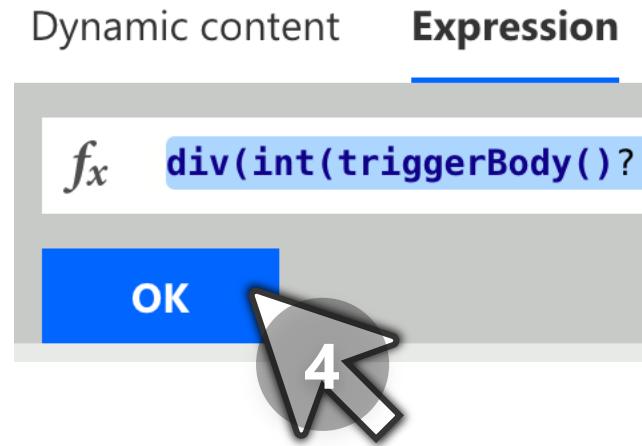
Get the incident type from work order See more

**Created By** Unique identifier of the user who created the record.

**Created By Type** Unique identifier of the user who created the record.

**Created On** Shows the date and time when the record was created. The ...

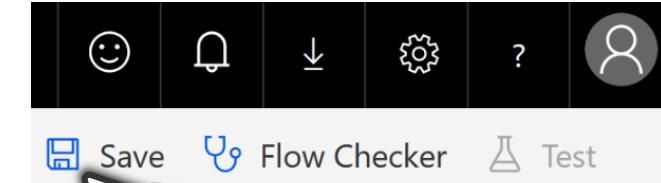
**Default Work Order Type** Unique identifier for Work Order Type associated with Incide...



**Dynamic content** **Expression**

*fx* `div(int(triggerBody())?['msdyn_primaryincidentestimatedduration'], 60)`

OK



# Flow master

1. Our Flow is complete. Well done!
2. Save

* Application	Sample Guide 2g8r7drx3iu
* Device	Device ID <span style="color: red;">x</span>
Device Template	Gachapon Capsule Toy Machine (1.0.0)
deviceTemplate	{}
Device Name	Display name of the device.
Device Simulated	Simulated flag of the device. True if device is simulated.
Device Connection ID	ID used for device connectivity.
Location	Property value of the device.
Last service date	Property value of the device.
Work Order Number	Work Order Number <span style="color: red;">x</span>
Work Order Status	System Status Label <span style="color: red;">x</span>
Incident Description	Name <span style="color: red;">x</span>
Work Order Id	Owner <span style="color: red;">x</span>
Estimated Arrival Time	div(...) <span style="color: red;">x</span>
Estimated Service Duration	Property value of the device.

1

2

# Dynamics 365

1. Navigate back to Dynamics 365, if you didn't navigate anywhere else in Dynamics since we started working on Flow, you should still be on the Work Orders Associated View for your IoT Alert. Close the Flow pop up window that may still be open too. Head over to the Work Order we created associated with our IoT Alert by selecting it's Number from the Associated View table.
2. As a quick test for our flow, select the Work Order Summary and edit it. In my case I added Super.
3. Save

General Commands **Work Orders** Related

Refresh Run Report Excel Templates Export Work Orders

Work Order Associated View Search for records

**Work Order ...** Service Account Work Order ... Created On Sub-Status System Status

00005	Active Transport Inc.	Inspection	4/18/2019 3:43 PM	---	Open - Unscheduled	
All # A E F G H I J K L M N O P Q R S T U V W X Y Z	1 - 1 of 1 (0 selected)					
0000	CFS - IoT Alert Process Fl... Active for 2 hours	Created	Create Case	Create Work Order (1 Hrs)	Schedule Work Order	Close Work Order

**Summary** Settings Record Log Service Tasks Products Services Address Location Related

00005  
Service Account \* Active Transport Inc.  
Billing Account Active Transport Inc.  
System Status \* Open - Unscheduled  
Sub-Status \* ---  
Work Order Summary  
Super High balance alert from IoT Central App  
Comments: 2019-04-18 13:43:21  
PRIMARY INCIDENT ID Primary Incident Type  
TMI Toy Machine Balance Inspection  
Active System Status: Open - Unscheduled Sub-Status: ---

**CUSTOMER DETAIL**  
Primary Contact ---  
Email ---  
Address Phone ---

**INCIDENTS**  
TM Toy Machine Balance Inspection 00005 Toy Machine Balance Inspection

**BOOKINGS**  
No data available.

Save

# Dynamics 365

Navigate back to your device dashboard in IoT Central.

If you visit IoT Central you'll now see your Dynamics 365 data sent over from Flow that we connected to the Dashboard. This data will be sent over every time a Work Order is saved or updated for this device.

I hope this guide was helpful to you or your team. We appreciate you considering the Azure and Dynamics products in your solution, thank you!



Device Template

## Gachapon Capsule Toy Machine (1.0.0)

[Measurements](#) [Settings](#) [Properties](#) [Commands](#) [Rules](#) [Dashboard](#)

**Library**

- Image
- Line Chart
- Bar Chart
- KPI
- Settings and Properties
- Label
- Map
- Event History
- State History
- Last Known Value

**Balance**

4:52:12 PM      5:22:48 PM

**Rare drop**

Event	Time
Rare drop	4/18/2019, 4:58:08 PM
Rare drop	4/18/2019, 5:00:17 PM
Rare drop	4/18/2019, 5:04:59 PM
Rare drop	4/18/2019, 5:07:49 PM
Rare drop	4/18/2019, 5:12:33 PM
Rare drop	4/18/2019, 5:17:31 PM

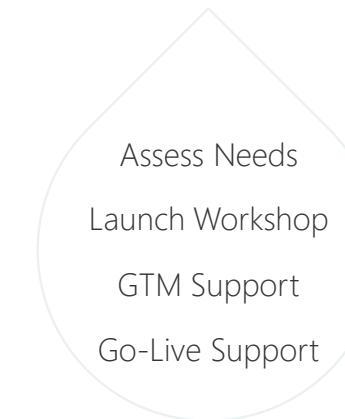
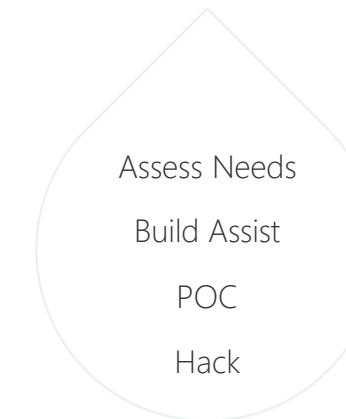
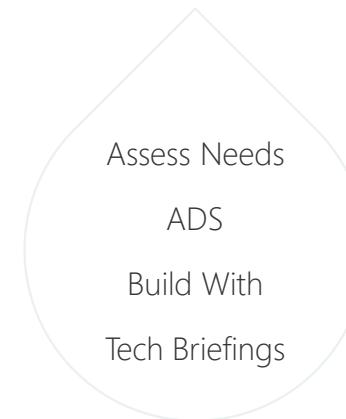
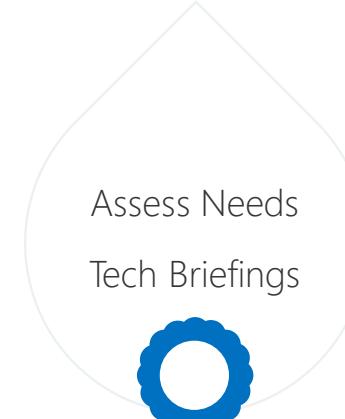
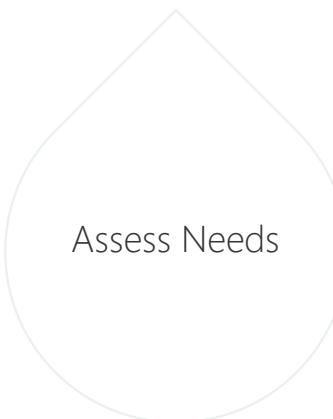
**Service Information**

Estimated Arrival Time	1	Estimated Service Duration	0
Work Order Owner Id	00005	Work Order Number	00005
		Incident Description	Toy Machine Balance Inspect...
		Work Order Status	Open - Unscheduled

# OCP Partner Journey

**You completed a basic CFS Deployment. Nice work!**

Discover → Educate → Design → Build → Launch



You're here

## What's next?

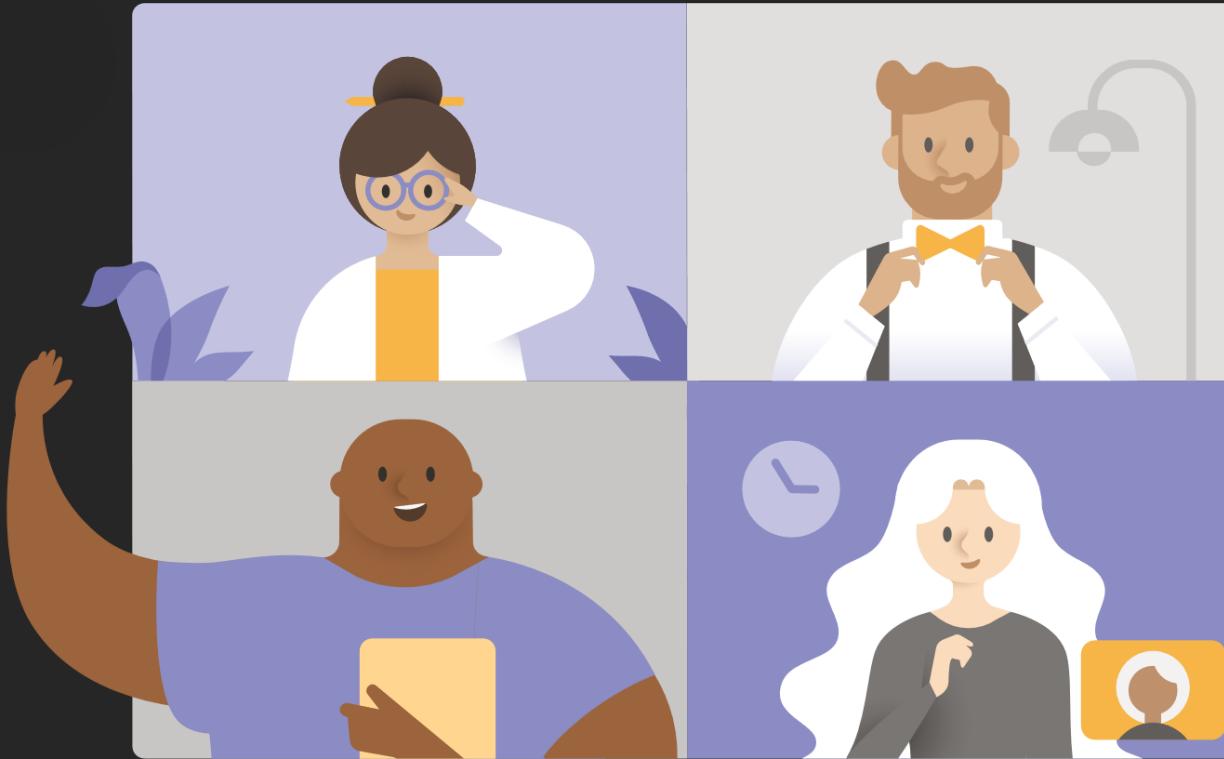
Check out my other labs that show you how to use IoT Hub with Dynamics 365 and how to work with real IoT Devices with Connected Field Service



IoT Central Application

To Save Cost for Pay as you Go users, stop or delete the services I've outlined under the section. This Service can be found in your Azure IOTC Resource Group.

Your time is value, we really appreciate you considering this service for your solution.



**Thank you**