RPA Design and Development

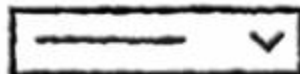v4.0

Lesson 21 | Integration Service

Ui Path

Integration Service – Exam Topics

1. Explain what Integration Service is

2. Use Integration Service Connectors and Triggers in an automation project

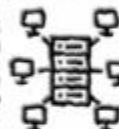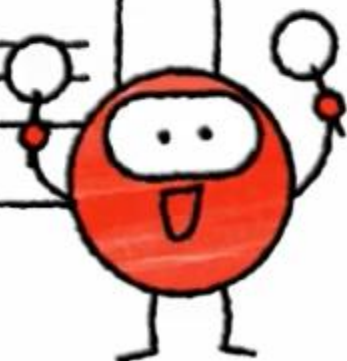3. Explain what the Integration Service Connector Builder is

Integration Service

- Allows organizations to centralize their API automation capabilities.

- Is designed to simplify and enhance the automation of third-party applications

- Allows faster integration into SaaS platforms

- Enables automation with an out-of-the-box library of connectors

- Helps setting up and managing connections easily with standardized authentication

- Enables kicking off automations with server-side triggers or events

- Provides curated activities and events (with additional data filters) for ease of use

- Simplifies automation design by providing a uniform experience across all Studio designers

Integration Service – Key Features
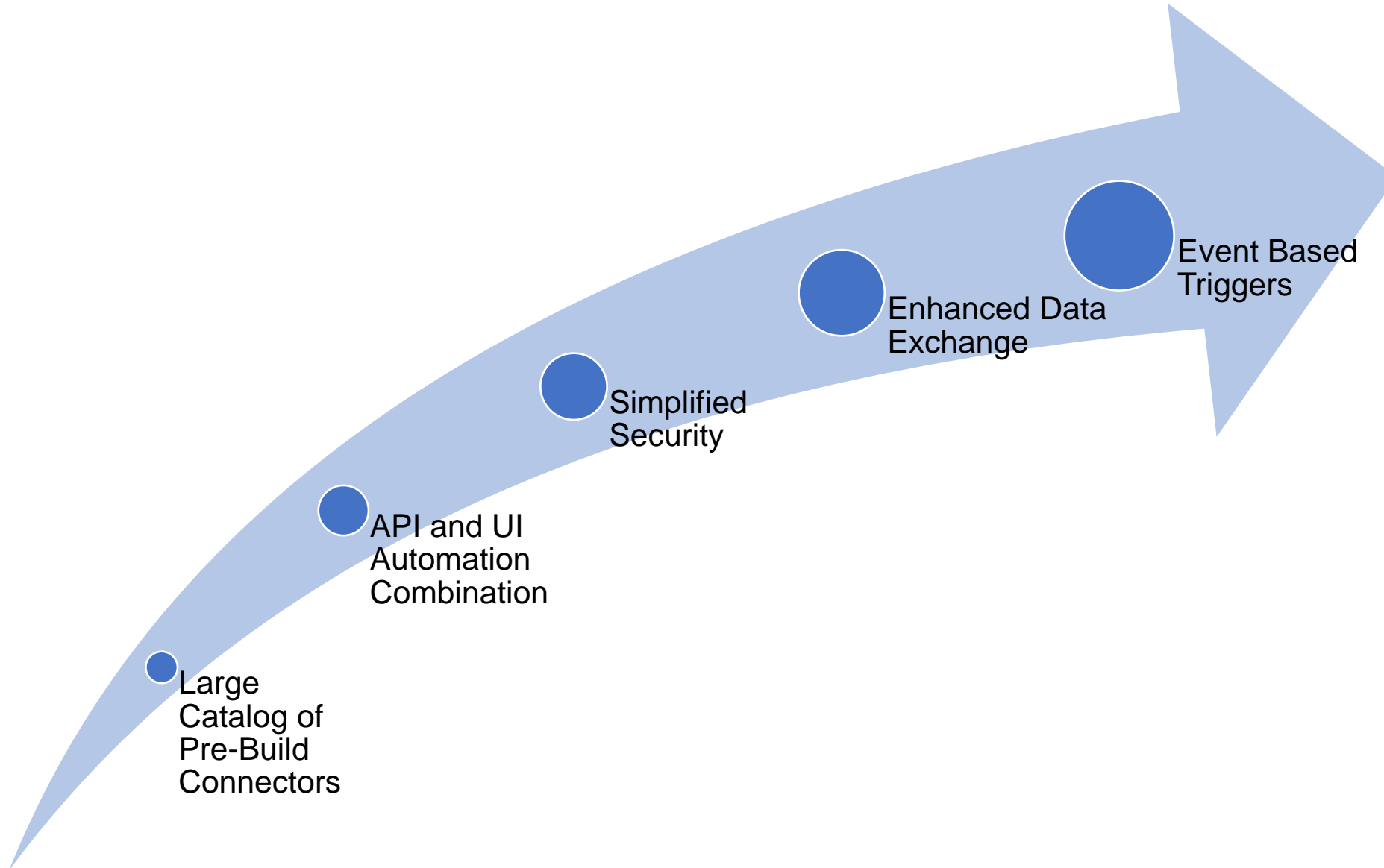
UiPath

- Large Catalog of Pre-Build Connectors
- API and UI Automation Combination
- Simplified Security
- Enhanced Data Exchange
- Event Based Triggers

Integration Service – Key Features

- Event Based Triggers
- Enhanced Data Exchange
- Simplified Security
- API and UI Automation Combination
- Large Catalog of Pre-Build Connectors

The Integration Service offers a wide range of popular, pre-built connectors, making it easier to integrate with various third-party applications. This saves time and effort in setting up connections and simplifies the integration process.

Integration Service – Key Features

Event Based
Triggers

Enhanced Data
Exchange

Simplified
Security

API and UI
Automation
Combination
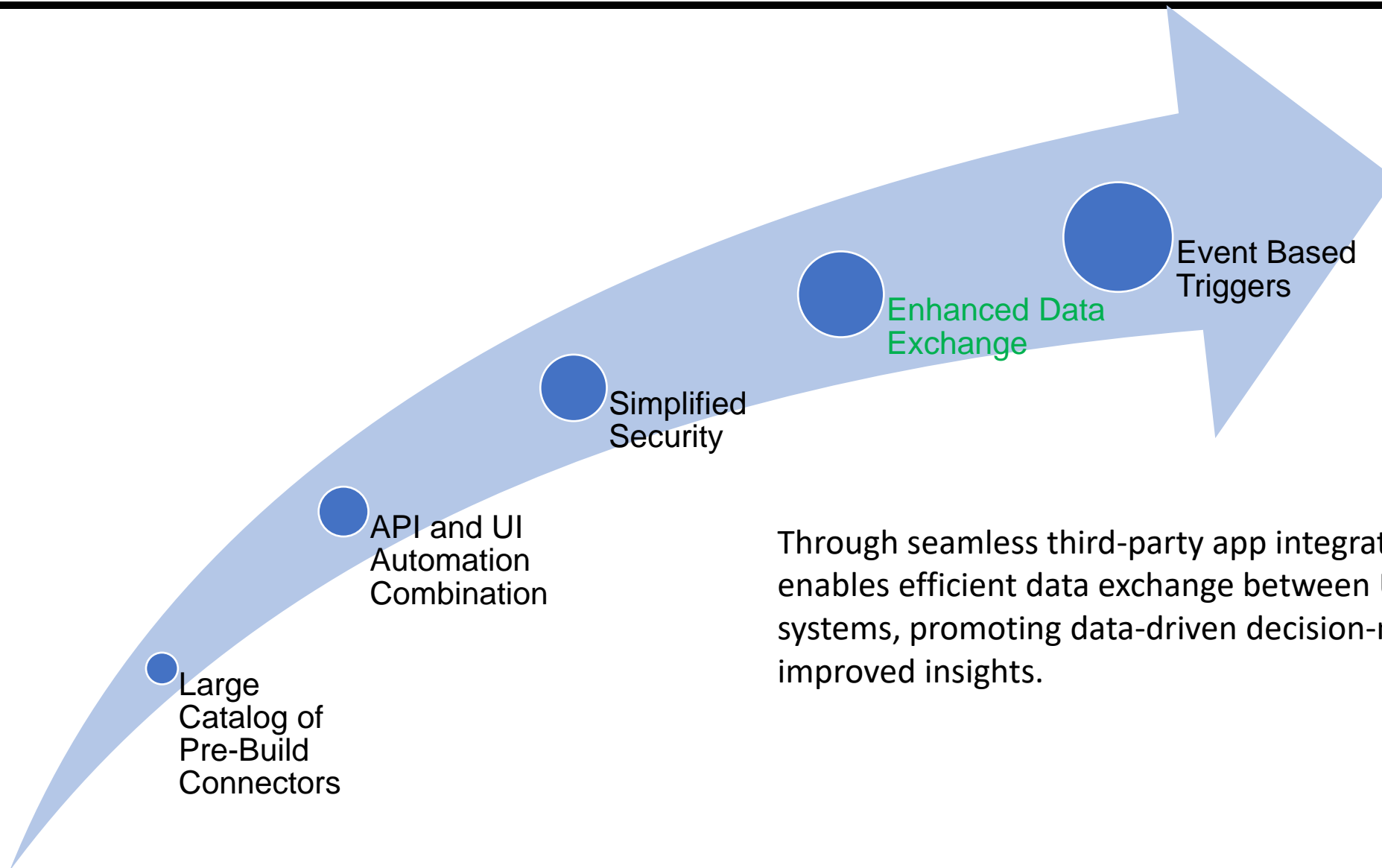
Large
Catalog of
Pre-Build
Connectors
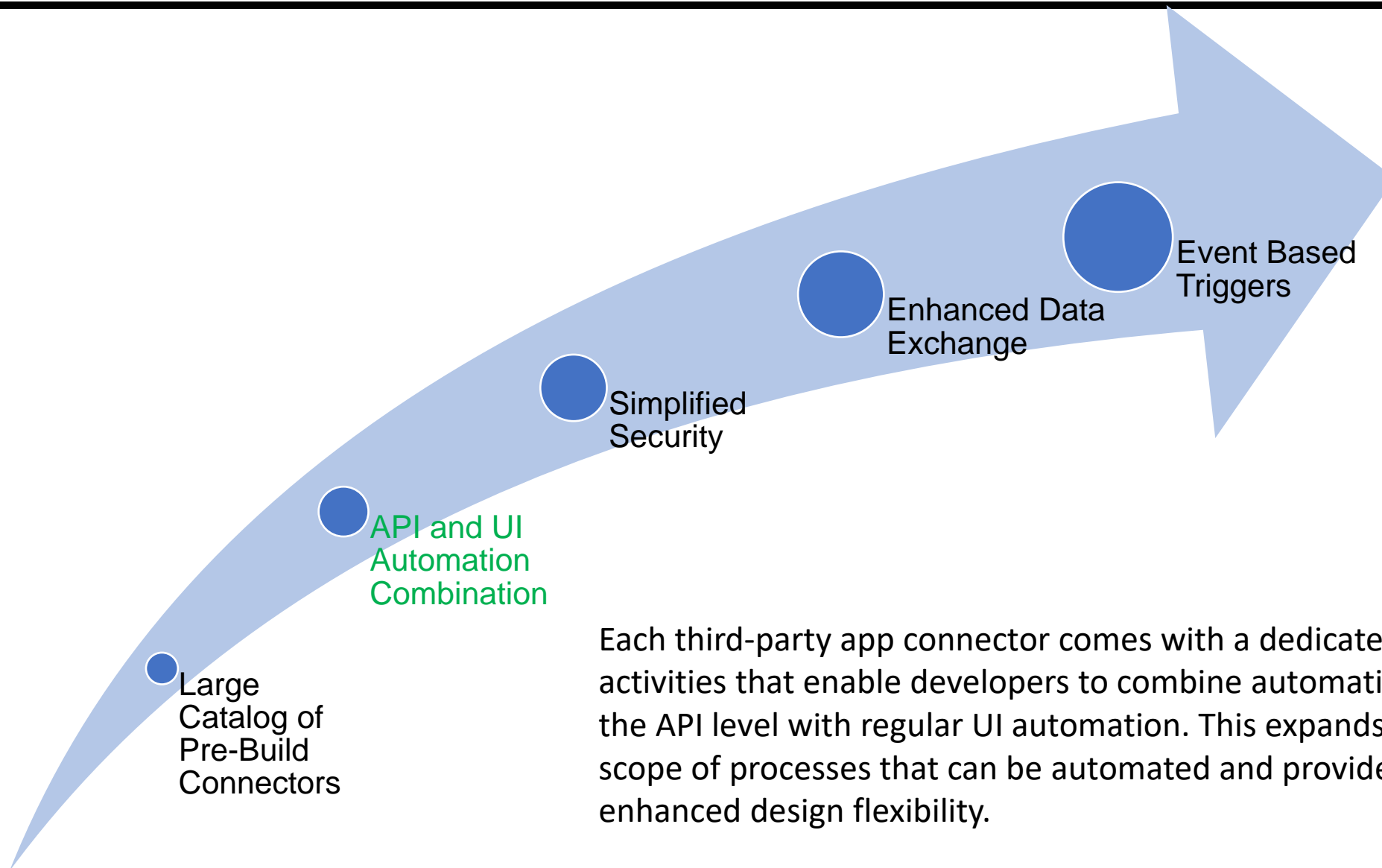
Each third-party app connector comes with a dedicated set of activities that enable developers to combine automation at the API level with regular UI automation. This expands the scope of processes that can be automated and provides enhanced design flexibility.

Integration Service – Key Features

UiPath

Event Based Triggers

Enhanced Data Exchange

Simplified Security

API and UI Automation Combination

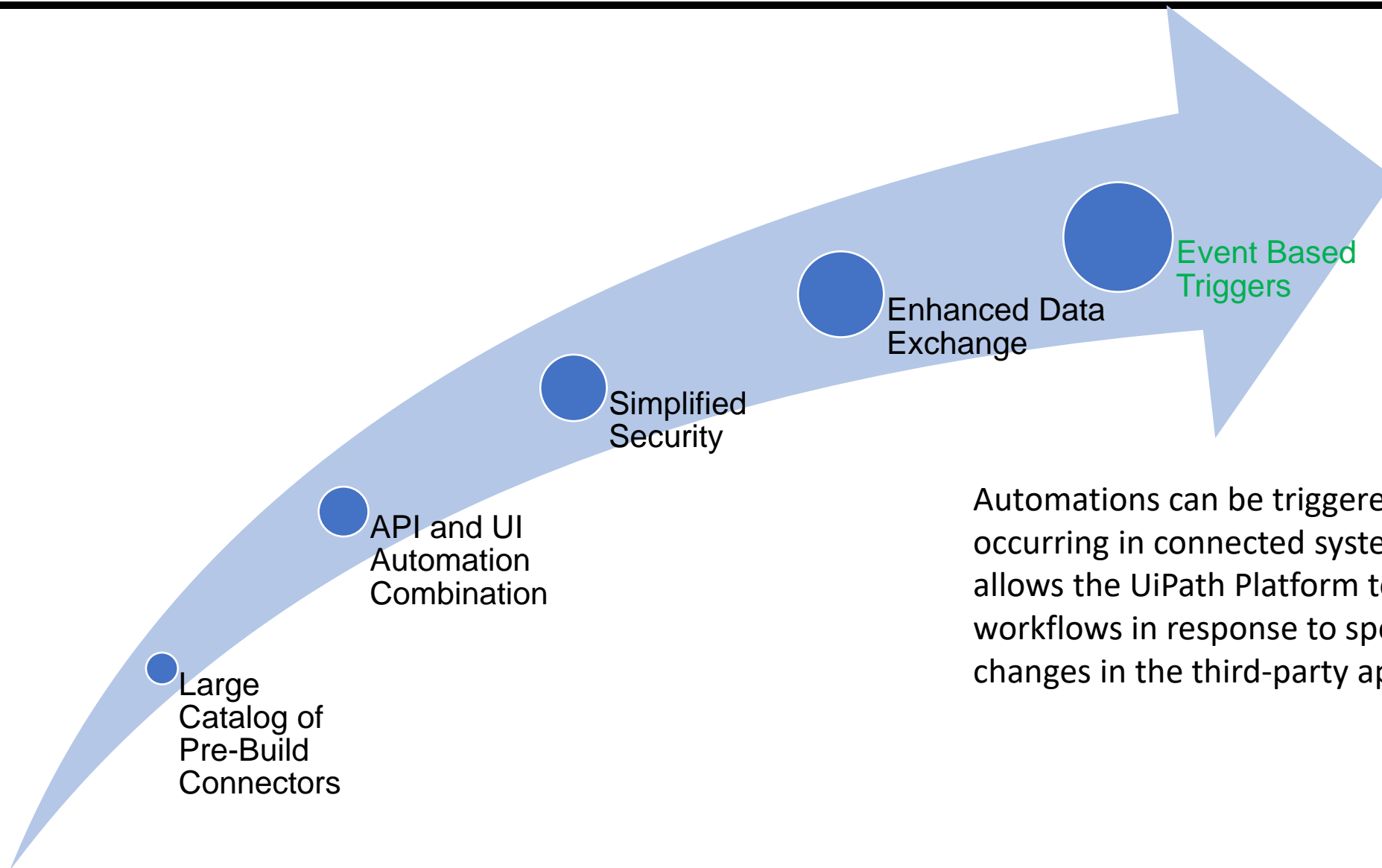Large Catalog of Pre-Build Connectors
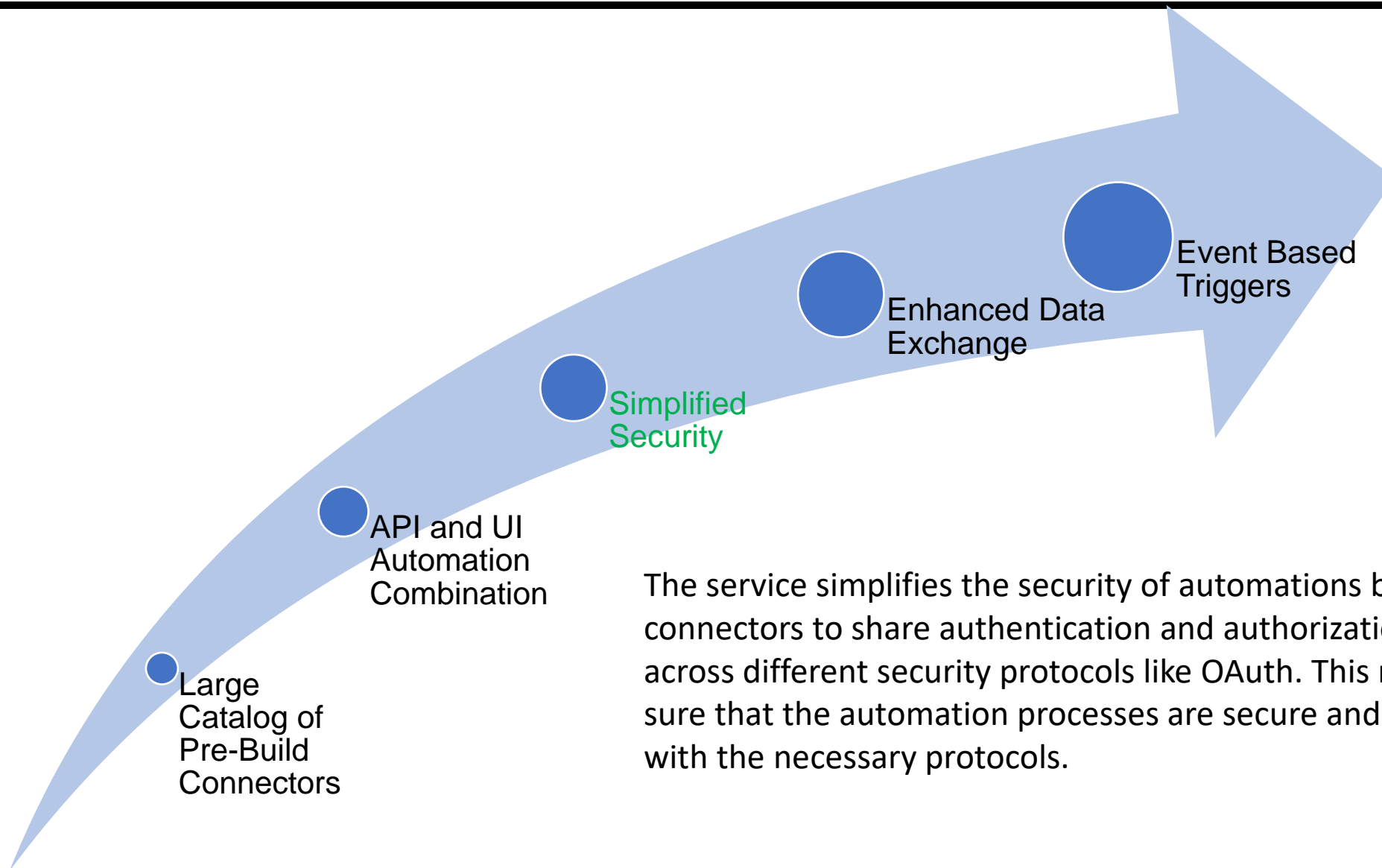
The service simplifies the security of automations by allowing connectors to share authentication and authorization usage across different security protocols like OAuth. This makes sure that the automation processes are secure and compliant with the necessary protocols.

Integration Service – Key Features

Event Based Triggers

Enhanced Data Exchange

Simplified Security

API and UI Automation Combination

Large Catalog of Pre-Build Connectors

Through seamless third-party app integration, the service enables efficient data exchange between UiPath and external systems, promoting data-driven decision-making and improved insights.

Integration Service – Key Features

UiPath

Large Catalog of Pre-Build Connectors

API and UI Automation Combination

Simplified Security

Enhanced Data Exchange

Event Based Triggers

Automations can be triggered based on events occurring in connected systems. This feature allows the UiPath Platform to launch automation workflows in response to specific actions or changes in the third-party applications.

The three components of Integration Service are:

- Connectors

- Connections

- Triggers

Connectors

Alternative to UI Integration for integration into popular SaaS platforms.
Faster and more reliable than UI Integration

- Pre-built API integration
- Comes with corresponding activity packs
- Combine with server-side triggers
- Connector Builder

Third-party application can be coupled with the specific connector and server-side triggers, so that robots react and respond automatically. Once set up, these connectors can be used in UiPath Studio and other products as well, such as UiPath Apps

Connectors

UiPath

|				
+ Build your connector	Sales and marketing CRM **Act! 365** Created by UiPath	Productivity eSignature **Adobe PDF Services** Created by UiPath	Artificial Intellig... +1 PREVIEW NEW **Amazon Bedrock** Created by UiPath	Artificial intelligence PREVIEW NEW **Amazon SageMaker** Created by UiPath
Developer PREVIEW **Amazon Web Services** Created by UiPath	Artificial intellig... +1 PREVIEW NEW **Anthropic Claude** Created by UiPath	Collaboration +2 NEW **Asana** Created by UiPath	Human resources **BambooHR** Created by UiPath	Content management **Box** Created by UiPath
Sales and marketing **Campaign Monitor** Created by UiPath	Collaboration Meetings +2 **Cisco Webex Teams** Created by UiPath	Content management PREVIEW **Citrix ShareFile** Created by UiPath	Collaboration +1 PREVIEW **Confluence Cloud** Created by UiPath	Sales and marketing PREVIEW **ConstantContact** Created by UiPath
Finance and accounting **Coupa** Created by UiPath	Documentation +2 NEW **DocuSign** Created by UiPath	Content management **Dropbox** Created by UiPath	Content management NEW **Dropbox Business** Created by UiPath	Healthcare PREVIEW **Epic FHIR R4** Created by UiPath

Connectors

UiPath

Finance and accounting	**Expensify** — Created by UiPath
IT and help desk +1	**Freshservice** — Created by UiPath
Developer — NEW	**GitHub** — Created by UiPath
Productivity — NEW	**Gmail** — Created by UiPath
Developer — PREVIEW	**Google Cloud Platform** — Created by UiPath
Productivity	**Google Docs** — Created by UiPath
Productivity +1	**Google Drive** — Created by UiPath
Productivity — NEW	**Google Sheets** — Created by UiPath
Artificial intelligence +1 — NEW	**Google Vertex** — Created by UiPath
Computer vision — PREVIEW	**Google Vision** — Created by UiPath
Collaboration Productivity +1	**GoToWebinar** — Created by UiPath
Social — PREVIEW	**Hootsuite** — Created by UiPath
Developer — PREVIEW	**HTTP Webhook** — Created by UiPath
CRM — PREVIEW	**HubSpot CRM** — Created by UiPath
Sales and marketing — PREVIEW	**HubSpot Marketing** — Created by UiPath
Sales and marketing — NEW	**iContact** — Created by UiPath
IT and help desk +1 — NEW	**Jira** — Created by UiPath
Sales and marketing	**Mailchimp** — Created by UiPath
Sales and marketing	**Marketo** — Created by UiPath
Developer — PREVIEW	**Microsoft Azure** — Created by UiPath

Connectors

UiPath

Developer	Artificial intelligence +2 NEW	CRM NEW	Productivity +1 NEW	Productivity Email NEW
Microsoft Azure Active Directory	**Microsoft Azure OpenAI**	**Microsoft Dynamics 365 CRM**	**Microsoft OneDrive & SharePoint**	**Microsoft Outlook 365**
Created by UiPath	Created by UiPath	Created by UiPath	Created by UiPath	Created by UiPath

Productivity Email	Artificial intelligence NEW	Productivity Messaging PREVIEW	Artificial intelligence NEW	Artificial intelligence +1 PREVIEW
Microsoft Outlook 365 (Legacy)	**Microsoft Sentiment**	**Microsoft Teams**	**Microsoft Translator**	**Microsoft Vision**
Created by UiPath	Created by UiPath	Created by UiPath	Created by UiPath	Created by UiPath

Artificial intelligence +1 NEW	Sales and marketing	ERP Finance and accounting	Finance and accounting NEW	CRM NEW
OpenAI	**Oracle Eloqua**	**Oracle NetSuite**	**QuickBooks Online**	**Salesforce**
Created by UiPath	Created by UiPath	Created by UiPath	Created by UiPath	Created by UiPath

Sales and marketing	CRM	NEW	Sales and marketing NEW	ITSM Workflows +2 NEW
Salesforce Marketing Cloud	**SAP Cloud for Customer**	**SAP Concur**	**SendGrid**	**ServiceNow**
Created by UiPath	Created by UiPath	Created by UiPath	Created by UiPath	Created by UiPath

Connectors

UiPath

Messaging +1 PREVIEW	Productivity
Slack	Smartsheet
Created by UiPath	Created by UiPath

Developer	CRM	CRM
Snowflake	Sugar Enterprise	Sugar Professional
Created by UiPath	Created by UiPath	Created by UiPath

CRM	IT and help desk	Messaging NEW	Social	Finance and accounting +1 NEW
Sugar Sell	Sugar Serve	Twilio	Twitter	Workday
Created by UiPath	Created by UiPath	Created by UiPath	Created by UiPath	Created by UiPath

IT and help desk	Collaboration +2 NEW
Zendesk	zoom Zoom
Created by UiPath	Created by UiPath

Connections

- Connections help in establishing tasks between single users and external applications.
- The connections are created once users authenticate with an API Provider.
- When you select a connector, the connections for that specific connector are displayed
- You can create connections in different folders and share the third-party application connections with other users across the organization.
- You can make the connections accessible for both attended and unattended users, groups, and robots

Connections

Steps to establish connections for the required connectors from UiPath Integration Service:

- Log in to UiPath Automation Cloud using your account.

- Navigate to the "Integration Service" section from the left-hand menu or under the "Services" tab.

- Click on the "Connectors" tab within the Integration Service section.

- Optionally, use the search box to find specific connectors by typing keywords or the connector's name.

- Select the desired connector from the list of available connectors.

- Review the connector's details and functionalities on the connector's information page.

- Follow the authentication process specified in the connector's documentation to establish a connection with the chosen connector.

Triggers

Triggers provide a mechanism for subscribing to specific events from third-party apps, which are passed through the connections. For example, a trigger can initiate an automation such as:

- Email Received: an automation can be triggered when a user receives a new email in their inbox.

- Form Submission: an automation can be triggered when a user submits a form on a website.

- New File Uploaded: an automation can be triggered when a new file is uploaded to a cloud storage service.

- Payment Received : an automation can be triggered when the inventory level of a product falls below a certain quantity.

Triggers

- Triggers provide a mechanism for subscribing to specific events from the third-party applications, giving you the flexibility to automatically start processes in Orchestrator.
- Automations can be kicked off based on events in connected systems by using triggers.
- Before using triggers, you need to have an automation project created, published and a trigger configured for that specific context

Triggers – Responding Process Input Arguments

1. **UiPathEventConnector**: this allows us to determine which connector initiated the process. By knowing the specific connector that triggered the automation, we can customize the workflow to handle the event accordingly. For instance, different actions might be required for events coming from Salesforce compared to events from OneDrive.

2. **UiPathEvent:** this helps us understand the type of event that occurred, whether it is a creation, update, or deletion event. Depending on the event type, different actions or processes can be executed to respond appropriately.

3. **UiPathEventObjectType**: this defines the specific record type resulting from the event. It enables us to identify the nature of the event and the corresponding data involved. This information is vital for determining the subsequent steps in the automation process.

4. **UiPathEventObjectId**: this provides the unique identifier for the object involved in the event. With this ID, we can access the relevant data or resources related to the event and perform the required tasks accordingly.

Triggers – Event Monitoring

Event monitoring is set to poll the status every 5 minutes. As such, it could take up to 5 minutes before an associated process starts. We can see a job's details under the Jobs tab in your Orchestrator folder. A job started from the Integration Service will show its source as integration Trigger.

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Configuring Triggers

Integration Service – User Onboarding Example

SAP SuccessFactors

1. To Be Onboarded Users
The users that need to be onboarded are managed in SAP SuccessFactors

HR Admin

2. Export to Excel

List of new employees

HR Admin

3. Upload Excel file to OneDrive

List of new employees in One Drive

Support Admin

4. Provision in SalesForce

salesforce

5. If Successful
Notify in O365 & Slack

6. If Errors
Create a ServiceNow Ticket

slack

servicenow

Which of the following statements best describes UiPath Integration Service?

- Choose one of the options below

○ UiPath Integration Service helps combine regular UI Automation with API level automation by offering a standardized system authorization and authentication for all third-party applications.

○ UiPath Integration Service is used in automating applications at API level offering a single activity package that can be used universally for all third-party applications.

○ UiPath Integration Service is best used in deploying simple automation projects that do not extend over multiple environments or systems.

Question

Which of the following statements best describes UiPath Integration Service?

- Choose one of the options below

✓ UiPath Integration Service helps combine regular UI Automation with API level automation by offering a standardized system authorization and authentication for all third-party applications.

✕ UiPath Integration Service is used in automating applications at API level offering a single activity package that can be used universally for all third-party applications.

✕ UiPath Integration Service is best used in deploying simple automation projects that do not extend over multiple environments or systems.

Question

Is it mandatory to have an Automation Cloud account to use UiPath Integration Service?

- Choose one of the options below

○ Yes

○ No

Is it mandatory to have an Automation Cloud account to use UiPath Integration Service?

- Choose one of the options below

✓ Yes

✕ No

Adding Connectors

Follow these steps to establish connections for the required connectors from UiPath Integration Service:

1. Log in to UiPath Automation Cloud using your account.

2. Navigate to the "Integration Service" section from the left-hand menu or under the "Services" tab.

3. Click on the "Connectors" tab within the Integration Service section.

4. Optionally, use the search box to find specific connectors by typing keywords or the connector's name.

5. Select the desired connector from the list of available connectors.

6. Review the connector's details and functionalities on the connector's information page.

7. Follow the authentication process specified in the connector's documentation to establish a connection with the chosen connector.

Adding Connectors

Each third-party app connector comes with a dedicated set of activities that allow us to combine regular UI automation with API automation.

Connectors allow us to create secure connections and associations between UiPath and third-party applications by standardizing authorizations and system authentication.

Connections allow us to establish tasks and exchanges between single users and external applications through the use of API Provider user authentication.

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Setting Up the Required Connectors

Using Connectors

Identify Required Activity Packages:

Identify the activity packages needed for integration tasks (e.g., Microsoft Office 365, Salesforce, servicenow, Slack).

Install Activity Packages:

Ensure you have the latest activity packages installed in UiPath Studio to leverage the most up-to-date features and integrations available.

Enable "Use Integration Service " Option:

After adding a connector to the workflow, checkmark the "Use Connection" box from the properties panel. This will automatically establish the default connection.

Access integration Activities:

Go to the "Integrations" section in UiPath Studio and select the relevant category (e.g., "Microsoft office 365 Activities") for your integration needs.

Using Connectors

Define Input Arguments:

Define the necessary input arguments (e.g., UiPath Event, Event connector, Event Object id, Event Object type) to receive information from the Integration Service.

Utilize Switch Activity:

Implement the Switch activity in your workflow to route the process flow based on the triggering connector (e.g., OneDrive, Salesforce, ServiceNow).

Set Up Switch Cases:

Set up individual cases in the Switch activity for each connector to execute specific actions based on the triggering connector.

Use Connector-Specific Activities:

Inside each Switch case, employ activities specific to the triggering connector (e.g., Office 365 activities for OneDrive, Salesforce activities for Salesforce).

Using Connectors

Handle Errors and Notifications:

Include error handling mechanisms to identify issues during the process and take corrective actions, such as logging warning messages or creating incidents in ServiceNow.

Send Stakeholder Notifications:
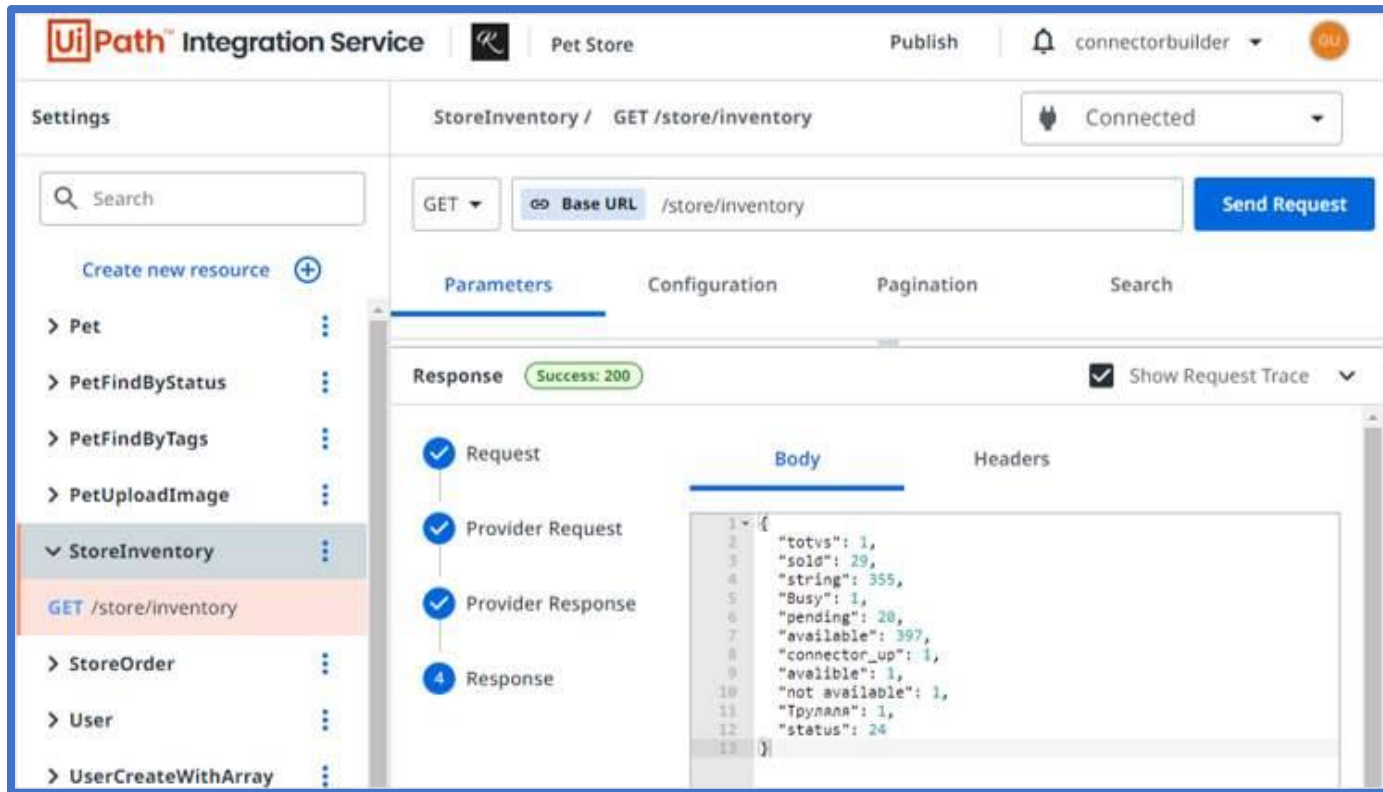
Use appropriate notification activities (e.g., Slack's "Send Message" activity) to keep stakeholders informed about progress or exceptional scenarios.

Save and Publish:

After successfully implementing the integration and completing the process, save and publish the automation project in UiPath Studio.

Connector Builder

Enables you to:

- Create and use a custom connector in Studio

- Use custom connectors **from Studio Web**

- Publish custom connectors and share them among users

Connector Builder

Connector Builder is a powerful feature in UiPath Studio that empowers users to design and use custom connectors. By harnessing the capabilities of Connector Builder, users can effortlessly establish connections between different applications and services.

Integration with the Integration Service: The Connector Builder experience is seamlessly integrated into the Integration Service, enabling users to create and utilize custom connectors directly from UiPath Studio.

Custom Connectors in Studio Web Automation Cloud: Users have the capability to use their custom connectors in the Studio Web Automation Cloud, providing them with flexibility and access to their connectors from anywhere.

Publishing and Sharing Custom Connectors: Automation Cloud includes the Connector Builder feature, empowering users to publish and share their customized connectors with others. This fosters collaboration among users and enhances the overall automation experience by expanding the pool of available connectors.

Connector Builder

Connector Builder is a tool for RPA developers with an understanding of APIs - such as REST and JSON - and an understanding of the application that they're trying to integrate.
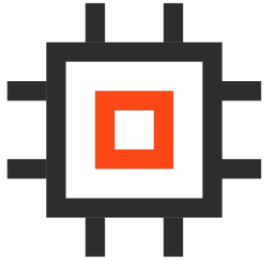
Technology Partners

UiPath technology partners take advantage of API integrations to create innovative solutions - based on their extensive industry knowledge and domain expertise

Community Developers

Community developers can contribute to the most popular applications on the market

UiPath Customers

UiPath customers can build integrations across their organizations to support bespoke use cases and specific applications

Connector Builder - – Authentication Methods
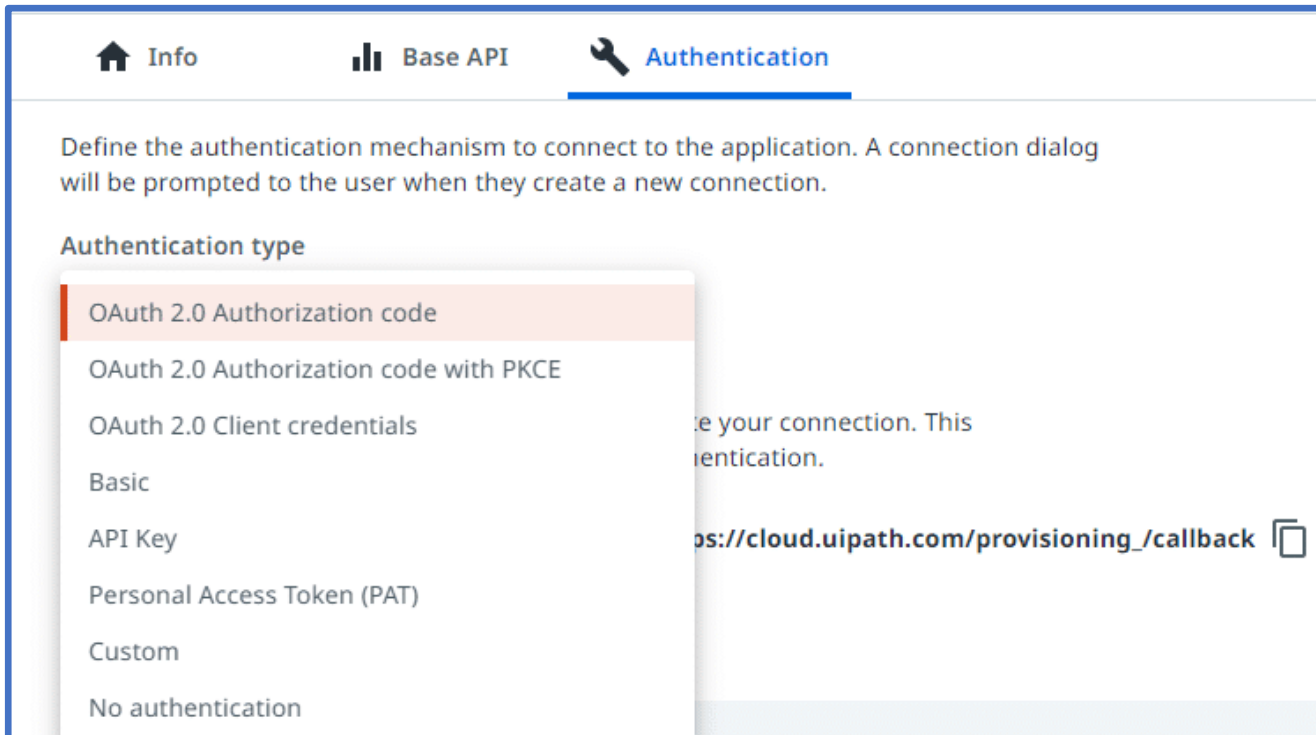
Connector Builder supports:

❑ **REST APIs only** with JSON payload
❑ Authentication types:
   ▪ OAuth 2.0 Authorization Code
   ▪ OAuth 2.0 Authorization code with PKCE
   ▪ OAuth 2.0 Client Credentials
   ▪ Basic
   ▪ API Key
   ▪ Personal Access Token (PAT)
   ▪ No Authentication

Connector Builder – Authentication Methods

- **OAuth 2.0 Authorization Code**: this method involves obtaining an authorization code from the API provider after the user grants permission. The code is then exchanged for an access token, which is used to access protected resources on behalf of the user.
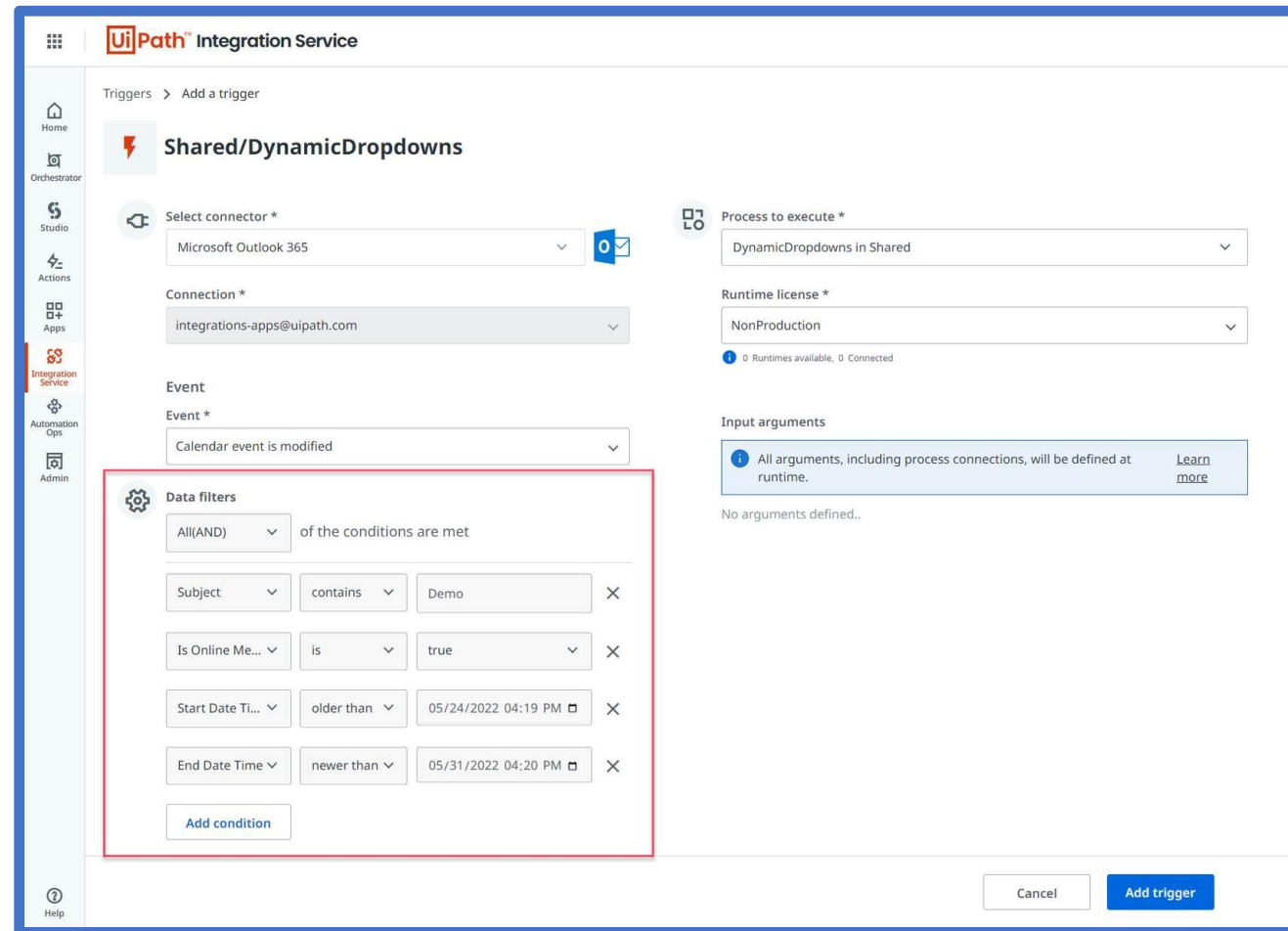
- **OAuth 2.0 Authorization Code with PKCE**: this enhanced version of the previous method adds a Proof Key for Code Exchange (PKCE) to improve security for mobile and native applications.

- **OAuth 2.0 Client Credentials**: in this method, the application itself (not a specific user) obtains an access token to access protected resources directly from the API provider.

- **Basic Authentication**: this is a simple authentication method where the user's credentials (username and password) are sent as a base64-encoded string in the HTTP header.

- **API Key**: an API Key is a unique alphanumeric code that acts as a credential to authenticate API requests. It's often used for simple authentication and to track API usage.

- **Personal Access Token (PAT):** a Personal Access Token is a type of token used for authentication, particularly in scenarios where a user interacts with APIs on their own behalf.

- **No Authentication**: some APIs may allow anonymous access, meaning no authentication is required to access the resources.

Connector Builder - Event Data filters

- Allow users to configure triggers for events that match specific data patterns

- Centralize event filtering logic to avoid different implementations across the UiPath portfolio

- Limit the number of events being generated to what is truly requested by the end-user

Connector Builder

- A "Connector Builder" feature allows users to create custom connectors to integrate different applications, services, or APIs seamlessly. These connectors act as bridges between different systems, enabling data and information to flow between them and facilitating automation workflows.

- Select "Add a new Connector": within the Integration Service, locate the Connectors tab and click on "Add a new Connector" to start the process of creating a new custom connector.

- You can start building your custom connector using one of the following **two options**:

  - ❖ **From an API Definition**: if you already have an API definition for the service or application you want to integrate, you can use it to create the connector. UiPath Automation Cloud supports API definitions in Swagger or Postman collection format. Import the API definition, and the Connector Builder will automatically generate the necessary actions and triggers based on the API specification.

  - ❖ **From a Blank Connector**: if you prefer to build your connector from scratch without an existing API definition, you can choose to start with a blank connector. This option allows you to define the actions, triggers, and parameters manually. You'll need to specify how your connector communicates with the external service or application and define the inputs and outputs for each action and trigger.

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Connector Builder Overview