AUTODESK UNIVERSITY

MFG500644

Hybrid PDM, PLM and ERP - Sync data between cloud and on-premises systems

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COOLORANGE

Learning Objectives

- Learn about the difficulties of synchronizing data between cloud systems and on-premises software
- Explore different ways to synchronize and transform data in hybrid environments (cloud PLM and on-prem PDM/ERP)
- Learn about efficiently transferring data from cloud systems to Vault Professional or to on-prem ERP systems
- Learn how to use Autodesk Forge Webhooks and Autodesk Fusion 360 Manage Scripting to notify on-premises software about changes.

Description

Product lifecycle management (PLM) systems such as Autodesk Fusion 360 Manage software or Upchain run in the cloud while Vault software and most enterprise resource planning (ERP) systems are still installed on-premises. Hidden behind firewalls, on-premises software cannot directly receive update notifications from cloud applications, and have difficulty synchronizing with changes from cloud systems. Polling data from large data sets is time consuming and inefficient. Automated synchronization and digital transformation of data between hybrid PDM, PLM, and ERP systems require more-sophisticated solutions. This class will demonstrate how to efficiently send data from cloud to on-premise systems. We'll use different examples to demonstrate how the Autodesk Forge Webhooks API and Autodesk Fusion 360 Manage Action Scripts are used to automatically update entities in Vault software, or how cloud PLM systems automatically send Bill of Materials (BOM) data to on-premise ERP systems without the need for the on-premise software to poll for data.

Speaker(s)

Christian Gessner is a co-founder and Technical Evangelist at COOLORANGE. In this role, he helps customers and resellers to use the right technology and tools to successfully design, implement and customize Autodesk PDM and PLM solutions. He has over 15 years of experience in software development with a focus on Autodesk data management products and Microsoft development technologies. Prior to COOLORANGE, Christian was member of the data management software engineering team at Autodesk

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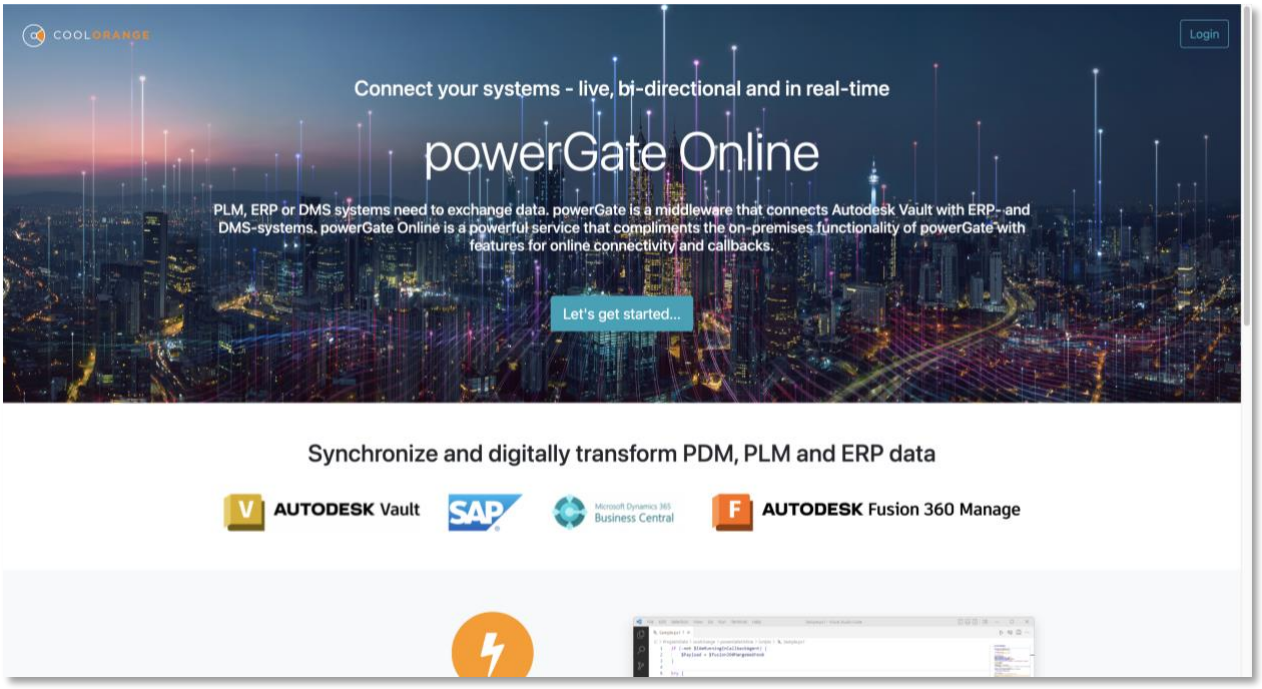
Table of Contents

powerGate Online

What is powerGate Online?

powerGate Online is an IPaaS (Integration Platform as a Service). Unlike other cloud-based integration services, *powerGate Online* delegates the business logic and data transformation to an on-prem service.
If all your systems (PLM, ERP or DMS) are cloud based, they can communicate by sending callbacks to each other. However, on-premise systems (like Vault and most traditional ERP systems) cannot communicate this way since they are behind a firewall.
powerGate Online solves this by using an on-prem service that acts as a local agent to securely handle these callbacks in real-time on the local machine.

Every time a callback is received from a cloud application, the local agent executes a PowerShell script to dispatch it on-premise. This allows *powerGate Online* to customize the behavior to your own needs. Besides that, powerful PowerShell modules, such as COOLORANGE powerVault, can be used to easily create custom business logic.

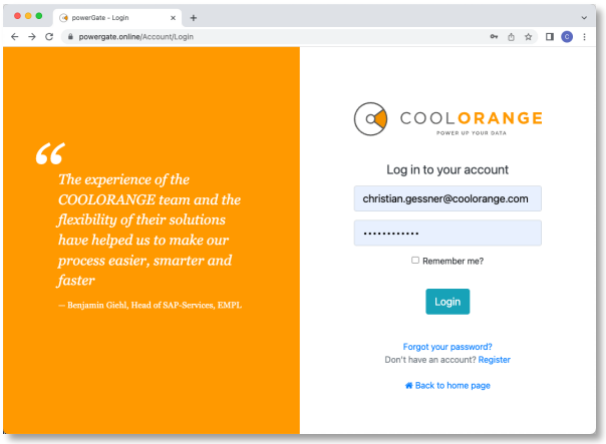


Web application

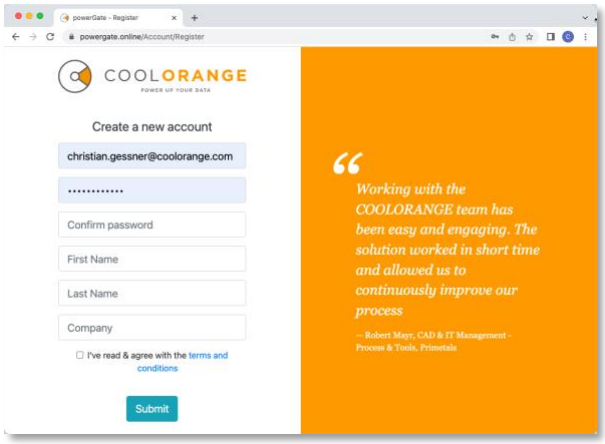
Registration / User Account

A one-time registration is required to active the service. After launching https://powergate.online with a browser, "Let's get started…" or "Login" navigates to the login screen. From there clicking on "Register" navigates to the registration page.

After submitting personal information such as *Name*, *Company*, *Email* and *Password* an email is sent that contains a link to finally activate the personal account.



Login page

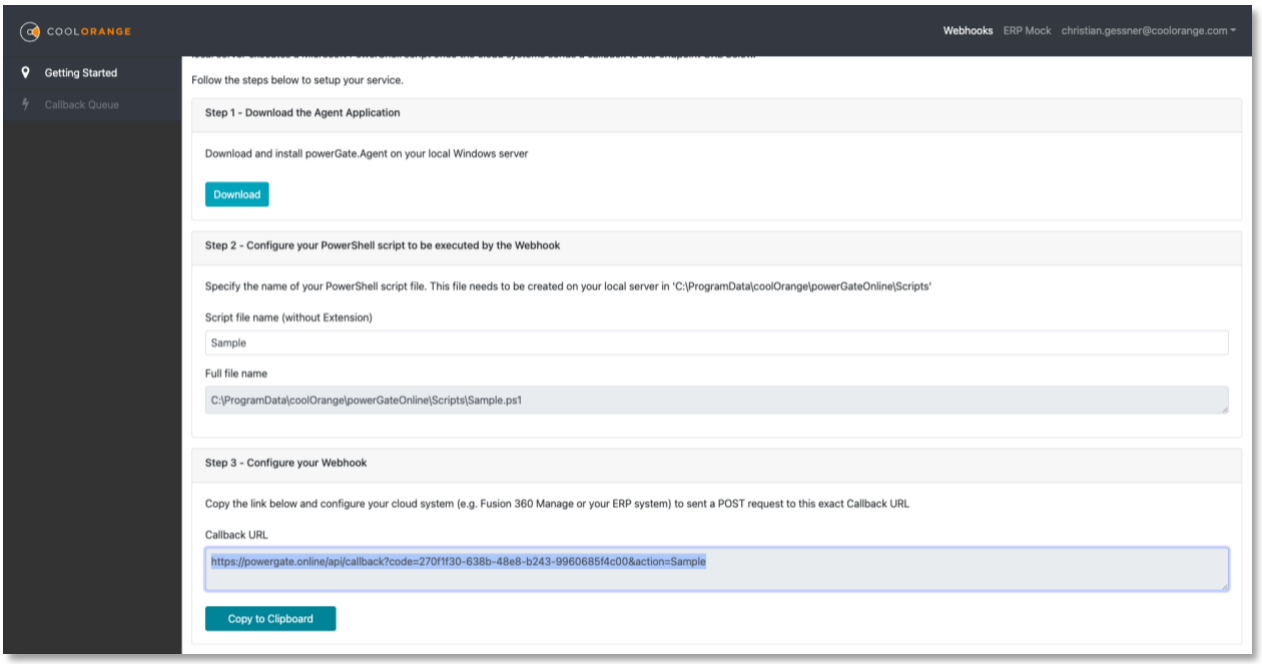


Register page

After the registration, the "Login" page can be used to get to the service.

Generating Callback URLs

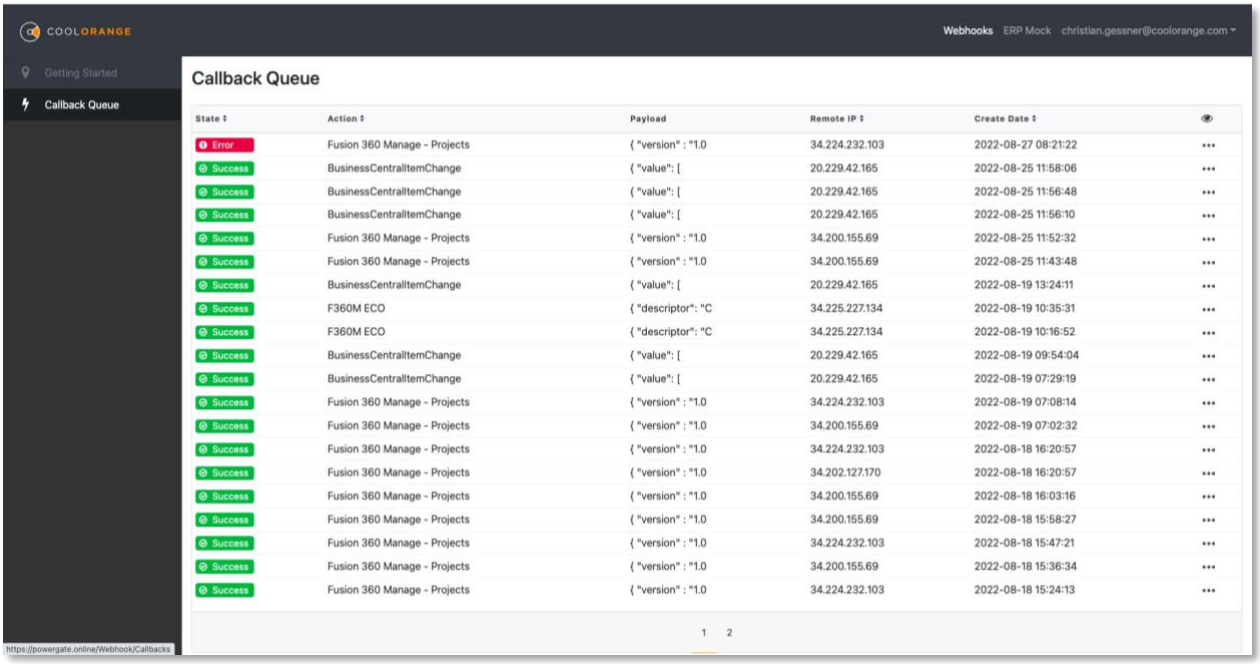
A callback URL is needed for Webhooks to send their notifications. *powerGate Online* can create such endpoints. On the "Getting Started" page, a callback URL can be generated. Just provide the file name of a PS1 (PowerShell) file that should be executed by the *powerGate Agent* when a callback is received. With the file name and the personal registration information, a unique callback URL is generated, which can be used to create webhooks in Autodesk Fusion 360 Manage, Autodesk Forge, Autodesk Upchain or other cloud applications.



Getting Started page

Callback Queue

On the "Callback Queue" page, all callbacks can be monitored:

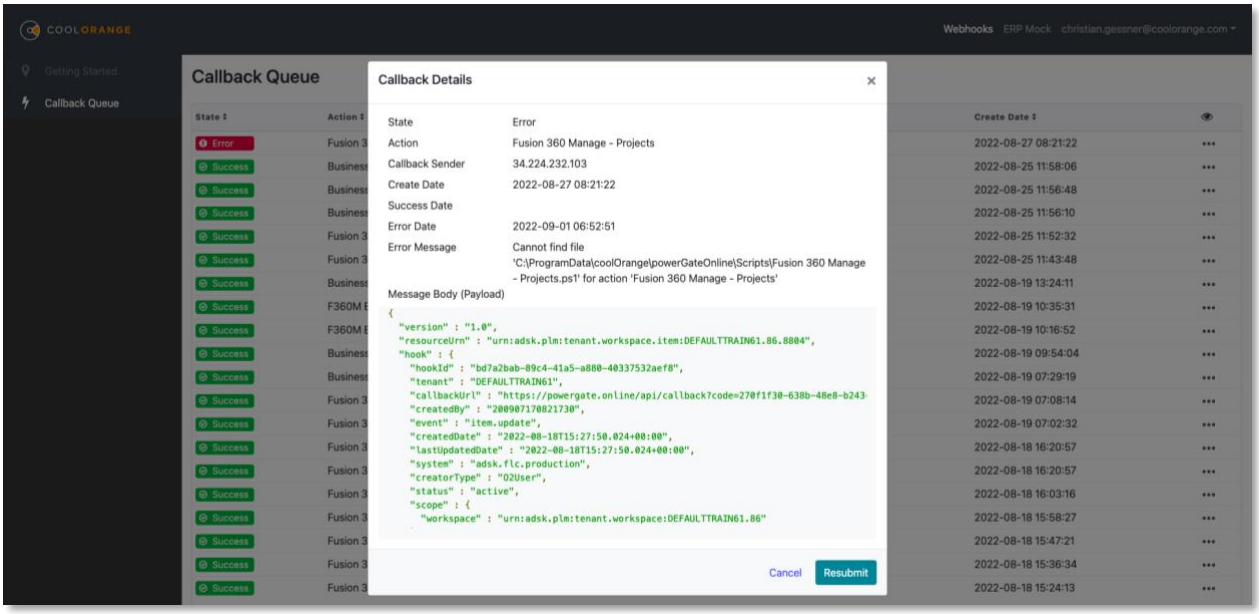


Callback Queue page

Details, such as the payload (the body the HTML callback) can be reviewed for each individual callback item using the "…" button.

Resubmit Jobs

On the details view of a callback, a job can be re-submitted if it ran into an error:



Callback detail view

powerGate Agent

A PowerShell script is executed by a local agent, every time a callback is received by *powerGate Online*. This allows to securely execute custom business logic that can even reach on-prem systems without the need to open the firewall.

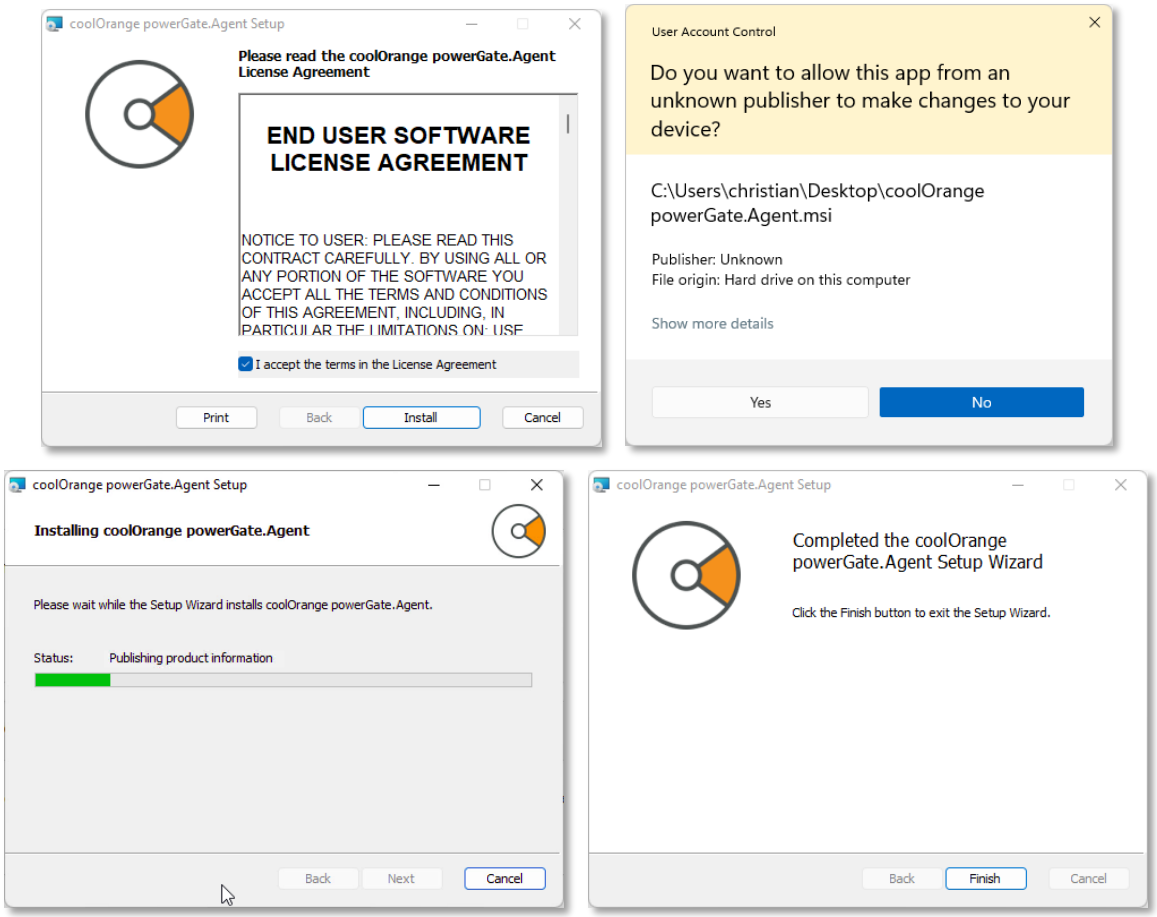
Download

On the "Getting Started" page a download button can be used to download the installer. As an alternative, the following link can be used directly: https://powergate.online/Webhook/Download

Installation

The setup can be started by executing the downloaded installer package MSI-file "*coolOrange powerGate.Agent.msi*". All settings are pre-configured, an installation wizard guides through a very straight forward installation process:

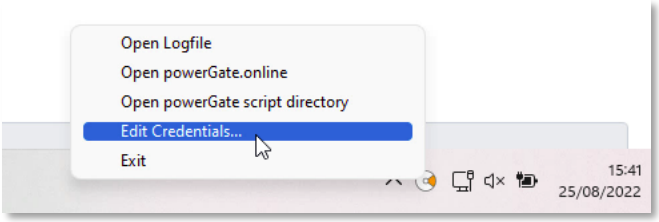
1. License Agreement page: Accept the terms and conditions and click "Install"
2. User Account Control Dialog: click "Yes"
3. Setup Progress page: Wait for the installer
4. Confirmation page: click "Finish"



Installer

System Tray

Once installed, a system tray application can be launched from the Windows start menu (can be found as "*powerGate.Agent.Tray.exe*"). When launched, a COOLORANGE icon appears in the system tray:

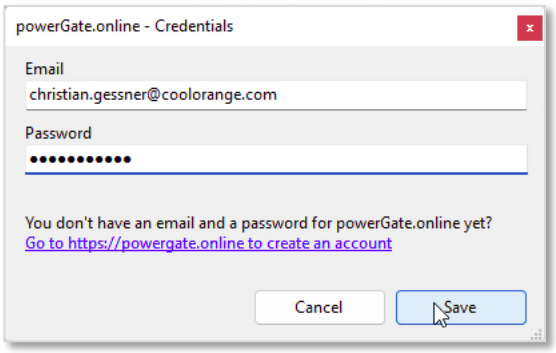


System Tray

When the COOLORANGE icon in the tray is clicked, a menu appears that can be used to

1. Navigate to the Logfile
2. Open https://powerGate.online in the default browser
3. Open the powerGate script directory ("*%ProgramData%\coolOrange\powerGateOnline\Scripts"*)
4. Edit the Credentials
5. Exit the system tray application

Before the Service (next chapter) gets started, "Edit Credentials…" must be used to insert the credentials from the *powerGate Online* web application. This tells the service which "account" or tenant needs to be used and connects the *powerGate Agent* with the callback receiver web application.



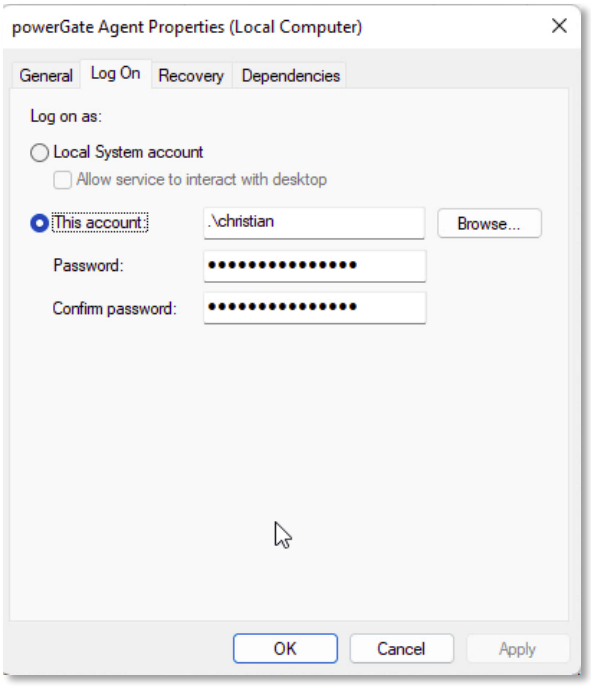
System Tray credentials dialog

The credentials are stored in "%ProgramData%\coolOrange\powerGateOnline\powerGate.Agent.config"; the password is encrypted!

Service

Before the service *powerGate Agent* gets started from the Windows services pane (Services.msc), the "*Log On*" user needs to be changed. This is necessary because some on-prem applications, including Autodesk Vault, require an account user to use the API. A "*Local System*" account is not supported. Therefore, the *powerGate Agent* service must run with a named Windows user.

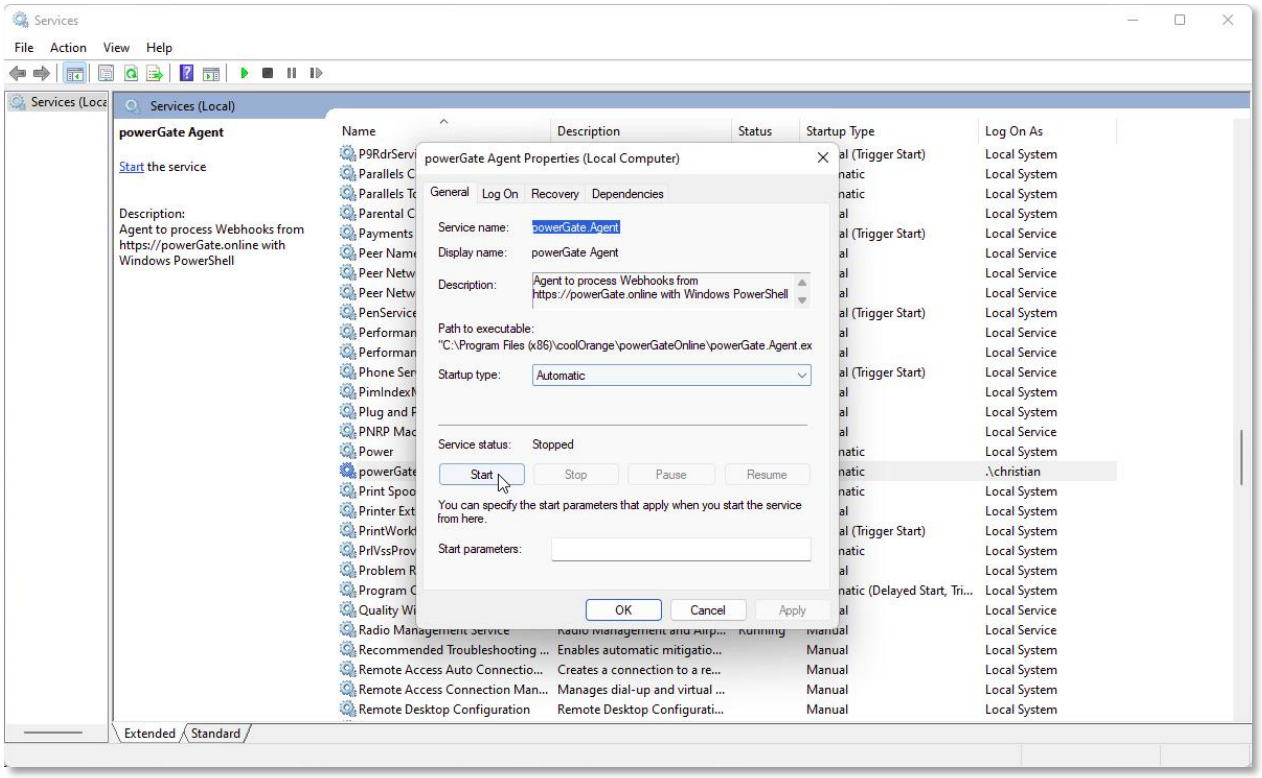
To change the user, open the service properties and navigate to the tab "*Log On"*. Select the "*This account*" checkbox and provide the Windows username along with its password:



Change service to run as "named" Windows user

Make sure that this user does not need to change its password regularly due to Windows policy restrictions. The service doesn't work if the user's password expired!

Once the log on user has been changed, the service can be started from the “General” tab:



Start the service “powerGate Agent”

PowerShell scripts

A Microsoft PowerShell script gets executed every time a callback arrives. This allows to use a powerful scripting language to be used to transform data and use existing PowerShell modules to easily create the business logic that is needed to synchronize data across different systems.

Script location

Scripts need to be in "*%ProgramData%\coolOrange\powerGateOnline\Scripts*". The name of the script determines if the script is executed when a callback comes in. The callback URL can be generated on the web applications "Getting Started" page.

Variables

Every time a script gets executed; two variables are pre-assigned by the *powerGate Agent*:

- $IAmRunningInCallbackAgent
- $Payload

$IAmRunningInCallbackAgent

This variable allows to distinguish between whether the script runs for testing purposes in Visual Studio Code or in PowerShell ISE or if it gets executed by the *powerGate Agent*. If executed by the *powerGate Agent*, the variable `$IAmRunningInCallbackAgent` is set to `$true`. Otherwise, the variable can be used to tell the script to assign the `$payload` variable with a fixed value for testing purposes.

For instance:

```
if (-not $IAmRunningInCallbackAgent) {
    $Payload = @'
{
    "ecrId":00000,
    "ecrNumber":"CR00000-10000",
    "projectId":0000,
    "eventType":"ecr.status.updated",
    "triggeredAt":"2022-09-29T12:00:00Z",
    "triggeredBy":"christian.gessner@coolorange.com",
    "statusOld":"WorkInProgress",
    "statusNew":"Completed"
}
'@
}
```

$Payload

The variable `$payload` contains the HTTP body sent by the Webhook sender. This is usually a JSON string.

Parsing a callback

Because the payload – the HTTP body, sent by the webhook originator – is received as a string, it needs to be manually parsed to extract the needed information. This can be archived using the ConvertFrom-Json cmdlet.

For instance:

```
$obj = ConvertFrom-Json -InputObject $Payload

$ecrId = $obj.ecrId

$ecrNumber = $obj.ecrNumber

$eventType = $obj.eventType
```

PowerShell modules

Several PowerShell modules and commands are available to easily implement the business logic that needs to execute when a callback is received:

powerVault

powerVault is a native PowerShell extension that allows you to talk with Vault via pure PowerShell cmdlets. With powerVault, you get command-lets for dealing with files and items For instance, Open-VaultConnection for establishing a connection to Vault, or Get-VaultFile for getting/downloading a file or Get-VaultItem for getting an item and many more.

Such cmdlets make it very easy to either get information from Vault or creating and updating information in Vault.
You don't have to deal with the complexity of the Vault API, instead you can just execute the command you like and let the cmdlet do the rest.

Link
https://doc.coolorange.com/projects/powervault/en/stable/

powerGate Client

powerGate Client is a collection of utilities, including a PowerShell extension that makes it possible to create scripts and applications that automate data synchronization with ERP systems.
It is designed for companies in which the engineering department works with Autodesk tools such as AutoCAD, AutoCAD Mechanical and Inventor for authoring data, as well as Vault for managing data. The PowerShell extension talks to the powerGate middleware that connects the ERP system and translate the payload between the Vault- and the ERP-ecosystems.

Link
https://doc.coolorange.com/projects/powergate/en/stable/

powerPLM Client

powerPLM (powerFLC) Client is a set of PowerShell cmdlets. The module provides cmdlets that allow creating scripts for automating the work with Fusion 360 Manage. These cmdlets allow to communicate with your Fusion 360 Manage Tenant in an easy to use and customizable way. powerPLM hides the complexity of the Fusion 360 Manage API by providing easy-to-use cmdlets such as Connect-FLC, Get-FLCItem or Update-FLC, to name just a few.

Link
https://doc.coolorange.com/projects/powerflc/en/stable/

To request a trial license or to purchase powerPLM or any other product from COOLORANGE, please contact sales@coolorange.com

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Invoke-RestMethod

The Invoke-RestMethod cmdlet sends HTTP and HTTPS requests to Representational State Transfer (REST) web services that return richly structured data.

PowerShell formats the response based to the data type. For JavaScript Object Notation (JSON) or XML, PowerShell converts, or deserializes, the content into [*PSCustomObject*] objects.

Link
https://docs.microsoft.com/en-us/powershell/module/microsoft.powershell.utility/invoke-restmethod?view=powershell-5.1

This cmdlet can be used to read data from ERP systems, or it can be used to update data after a callback has been received.

Multiple HTTP calls may be needed. One to authenticate, another to read or update the data with the authentication token gathered from the first call provided in the header.

Webhooks

A webhook can be thought of as a type of API that is driven by events rather than requests. Instead of one application making a request to another to receive a response, a webhook is a service that allows one program to send data to another as soon as a particular event takes place.

To subscribe to this event, a webhooks needs to be configured at the application that sends out the webhook because the application needs to know the URL that receives the callback (*Callback URL*).

Usually, a webhook can be subscribed using the application's API (Application Programming Interface).

The Postman app (https://www.postman.com/downloads/) can be used to send the API calls below. Several postman collections are part of the class materials!

The examples below for
- Fusion 360 Manage,
- Upchain and
- Microsoft Business Central

demonstrate how to use the application's APIs to
- get all existing webhooks,
- create a new webhook and
- delete a webhook

Forge / Fusion 360 Manage

Get existing webhooks

Request:

```
GET https://developer.api.autodesk.com/webhooks/v1/hooks HTTP/1.1
```

Header:

```
Authorization: Bearer <BEARER_TOKEN>
```

Get all Fusion 360 Manage workspaces

Get a list of all available workspaces from a Fusion 360 Manage tenant. The URN of a workspace is needed to create a new webhook:

Request:

```
GET https://<TENANT>.autodeskplm360.net/api/v3/workspaces?limit=50 HTTP/1.1
```

Header:

```
Authorization: Bearer <BEARER_TOKEN>
```

Create new webhook

Request:

```
POST https://developer.api.autodesk.com/webhooks/v1/systems/adsk.flc.production/
      events/<EVENT>/hooks HTTP/1.1
```

Header:

```
X-Tenant: <TENANT_UPPERCASE>
Authorization: Bearer <BEARER_TOKEN>
Content-Type: application/json
Content-Length: <BODY_LENGHT>
```

Body:

```
{
    "callbackUrl": "<CALLBACK_URL>",
    "scope": {
        "workspace" : "<WORKSPACE_URN>"
    }
}
```

The following events (`<EVENT>`) are supported by Autodesk Forge:

Event	Description
item.clone	When a Fusion 360 Manage item is cloned.
item.create	When a Fusion 360 Manage item is created.
item.lock	When a Fusion 360 Manage item transitions into a locked state.
item.release	When a Fusion 360 Manage item is released.
item.unlock	When a F360M item transitions from locked to an unlocked state.
item.update	When the item details of a Fusion 360 Manage item are updated.
workflow.transition	When a specific transition is performed on a F360M item.

Note: The X-Tenant header value must be uppercase to be recognized by Autodesk Forge!

Delete webhook

Request:

```
DELETE https://developer.api.autodesk.com/webhooks/v1/systems/data/
      events/<EVENT>/hooks/<HOOK_ID> HTTP/1.1
```

Header:

```
Authorization: Bearer <BEARER_TOKEN>
```

Links

https://forge.autodesk.com/en/docs/webhooks/v1/reference/http/webhooks/systems-system-hooks-POST/

Upchain

Get existing webhooks

Request:

```
GET https://live.upchain.net/api/v1/hooks/ HTTP/1.1
```

Header:

```
Upc-Selected-Company: <COMPANY_ID>
Authorization: Bearer <BEARER_TOKEN>
```

Create new webhook

Request:

```
POST https://live.upchain.net/api/v1/hooks/ HTTP/1.1
```

Header:

```
Upc-Selected-Company: <COMPANY_ID>
Authorization: Bearer <BEARER_TOKEN>
Content-Type: application/json
Content-Length: <BODY_LENGHT>
```

Body:

```
{
    "description":"<WEBHOOK_DESCRIPTION>",
    "events": [
        "<EVENT>"
        ],
    "url":"<CALLBACK_URL>"
}
```

The following events (`<EVENT>`) are supported by Upchain:

Event	Description
conversion.finished	Notifications are sent to the subscriber when translations are generated.
ecr.status.updated	Notifications are sent whenever a Change request (CR) workflow passes an Update primitive that is configured as Type > Work Order Status.

Delete webhook

Request:

```
DELETE https://live.upchain.net/api/v1/hooks/<WEBHOOK_ID> HTTP/1.1
```

Header:

```
Upc-Selected-Company: <COMPANY_ID>
Authorization: Bearer <BEARER_TOKEN>
```

Links

https://help.autodesk.com/view/UPCHN/ENU/?guid=UC-API-WBHK-NTFCTN

Business Central

Get existing webhooks

Request:

```
GET https://api.businesscentral.dynamics.com/v2.0/<ENVIRONMENT>/api/
      v2.0/subscriptions HTTP/1.1
```

Header:

```
Authorization: Bearer <BEARER_TOKEN>
```

Create new webhook

Request:

```
POST https://api.businesscentral.dynamics.com/v2.0/<ENVIRONMENT>/api/
      v2.0/subscriptions HTTP/1.1
```

Header:

```
Authorization: Bearer <BEARER_TOKEN>
Content-Type: application/json
Content-Length: <BODY_LENGHT>
```

Body:

```
{
  "notificationUrl": "<CALLBACK_URL>",
  "resource": "/api/v2.0/companies(<COMPANY_ID>)/items"
}
```

Delete webhook

Request:

```
DELETE https://api.businesscentral.dynamics.com v2.0/sandbox/api/
      v2.0/subscriptions('<SUBSCRIPTION_ID>') HTTP/1.1
```

Header:

```
Authorization: Bearer <BEARER_TOKEN>
If-Match: <SUBSCRIPTION_@ODATA.ETAG>
```

Note: Environment ***<ENVIRONMENT>*** *can be either "sandbox" or "production"*

Links

https://docs.microsoft.com/en-us/dynamics365/business-central/dev-itpro/api-reference/v2.0/dynamics-subscriptions

https://docs.microsoft.com/en-us/dynamics365/business-central/dev-itpro/api-reference/v2.0/dynamics-subscriptions

https://docs.microsoft.com/en-us/dynamics365/business-central/dev-itpro/administration/automation-apis-using-s2s-authentication

https://www.kauffmann.nl/2021/07/06/service-to-service-authentication-in-business-central-18-3-how-to-set-up/

Action Scripts

Fusion 360 Manage

In addition to webhooks, Fusion 360 Manage supports scripts (JavaScript) to be executed on several events, such as a workflow action or a button in the UI.
This can be used to send HTTP POST messages – just like a webhook would do – to *powerGate Online*.

A JavaScript script that sends a message to a callback URL would look like this:

```
// Defining the payload data
var obj = {
    descriptor: item.key,
    number: item.NUMBER,
    title: item.TITLE,
    description: item.DESCRIPTION,
    owner: item.descriptor.ownerID,
    workspace: item.master.workspaceID,
    dmsID: item.master.dmsID
};

// Converting JS object to JSON string
var payload = JSON.stringify(obj, null, 2);

// Creating HTTP request
var request = new XMLHttpRequest();
request.withCredentials = false;

// Defining the method and endpoint
request.open("POST", "<CALLBACK_URL>");

// Defining the content type
request.setRequestHeader("Content-Type", "application/json");

// Send the request
request.send(payload);
```

Links
https://help.autodesk.com/view/PLM/ENU/?guid=DEV-ABOUT-SCRP

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Additional Materials

AU Online Classes

Share Your Bill of Materials: Connecting PDM, PLM, and ERP

Author
Christian Gessner

Description
Bills of materials (BOMs) serve several purposes throughout a product lifecycle. While BOM data is usually created by CAD designers and managed in product data management (PDM) systems such as Vault software, it also needs to be shared with departments outside engineering where BOM information is used for production planning, assembling, or purchasing. Each of these steps requires a different view of the same BOM. Sometimes BOMs even need to be extended with information such as "work stages" or "work orders." Sharing and enriching BOM information is usually done in systems other than Vault, such as Fusion 360 Manage or enterprise resource planning (ERP) systems. This class will explore bills of materials and their different uses. We'll showcase different ways to share BOM data among product lifecycle management (PLM) systems, PDM systems, and ERP systems. And we'll analyze the available APIs to help you implement BOM workflows among Vault Professional (PDM), Fusion 360 Manage (PLM), and ERP systems.

Link
https://www.autodesk.com/autodesk-university/class/Share-Your-Bill-Materials-Connecting-PDM-PLM-and-ERP-2021

Synchronizing Change Orders Between Vault and Fusion 360 Manage

Author
Christian Gessner

Description
Both Vault Professional software and Fusion 360 Manage software enable you to delegate, track, and manage your data changes. While Vault Professional focuses on CAD-related changes, Fusion 360 Manage enables you to manage any data stored in the application. With powerPLM, COOLORANGE offers an easy-to-use and flexible tool to combine Fusion 360 Manage and Vault Professional processes. This class demonstrates how to use powerPLM to synchronize CAD design changes between Fusion 360 Manage and Vault Professional.

Link
https://www.autodesk.com/autodesk-university/class/Synchronizing-Change-Orders-Between-Vault-and-Fusion-360-Manage-2021

Vault Advanced Administration

Author
Lauren Drotar, Kim Hendrix

Description
Basic administration of Vault software is pretty clean, but what about when your data over the years has gotten dirty. Ever feel like you'd like to run your data through a power wash? Maintaining a clean functioning Vault takes time if done manually. In this class, we'll explore ways to use PowerShell and the API to clean, rearrange, and add metadata to your data. Duplicate file names, missing information, other data sources, or maybe a new file structure. You can handle all of these things and more with PowerShell and the API.

Link
https://www.autodesk.com/autodesk-university/class/Vault-Advanced-Administration-2021

Joint Effort: Vault and Fusion Lifecycle As the New Dream Couple

Author
Christian Gessner

Description
When used together, Vault Professional software and Fusion Lifecycle software provide a combined solution that is the best of all worlds for product data management (PDM) and product lifecycle management (PLM). While Vault runs on-prem to keep your CAD data safe behind your firewall, Fusion Lifecycle is cloud-based for flexibility and ease of deployment. With powerFLC (Vault Fusion Lifecycle connector), coolOrange offers an easy-to-use and flexible tool to combine Fusion Lifecycle and Vault processes. Previous versions of powerFLC included predefined workflows, and with the latest version of powerFLC, it is even possible to create custom workflows to synchronize any data between Vault and Fusion Lifecycle. This class will demonstrate the advantages of using both products together and show some of the endless possibilities of this integration.

Link
https://www.autodesk.com/autodesk-university/class/Joint-Effort-Vault-and-Fusion-Lifecycle-New-Dream-Couple-2020

PDM and PLM United: Vault Fusion Lifecycle Connector – a Zero-Code Connector

Author
Christian Gessner

Description
When used together, Vault Professional software and Fusion Lifecycle software provide a combined solution that is the best of all worlds for product data management (PDM) and product lifecycle management (PLM). While Vault runs on-premises to keep your CAD data safe behind your firewall, Fusion Lifecycle is cloud based for flexibility and ease of deployment. Sadly, this has made a seamless integration between the two difficult—until now. This class describes the benefits of the Vault Fusion Lifecycle Connector, including installation, configuration, and extensibility, so you can create a best-of-all-worlds solution.

Link
https://www.autodesk.com/autodesk-university/class/PDM-and-PLM-United-Vault-Fusion-Lifecycle-Connector-Zero-Code-Connector-2019

Autodesk Vault 2020—Programming 101

Author
Markus Koechl, Jeffrey Fishman

Description
Get started programming Vault Workgroup or Vault Professional applications, extensions, and custom jobs. The Vault 2020 Software Development Kit (SDK) shares new templates and sample code removing barriers accessing the entry level in Vault Web Services, Vault Job Processor, and Vault Client programming. This class will discuss real-life automation and extension tasks, and will guide participants through the steps required to solve them.

Link
https://www.autodesk.com/autodesk-university/class/Autodesk-Vault-2020-Programming-101-2019

Vault Extensions Snorkeling—First Touch to Vault Extension and Automation Programming

Author
Markus Koechl, Christian Gessner

Description
Vault data management software isn't just a single program; it's a framework, composed of many pieces like CAD add-in or Vault Explorer (Client) working together. You can customize some of these pieces and not others. This class will discuss the various ways to customize and integrate with Vault, including Vault Data Standard advanced scripting layer and Vault application programming interface. Following samples of standalone applications interacting with Vault, jobs automating repetitive tasks, or event handlers extending workflows, you can get started scripting and coding your own first extensions.

Link
https://www.autodesk.com/autodesk-university/class/Vault-Extensions-Snorkeling-First-Touch-Vault-Extension-and-Automation-Programming-2017

Seamless integration with Forge Webhooks

Author
Adam Nagy, Monmohan Singh

Description
Take your Forge applications to the next level with the newly introduced Forge Webhooks API. Webhooks are an industry standard mechanism for subscribing to 'event notifications', allowing you to streamline and simplify your Forge workflows and leverage leading integration services such as Jitterbit, Zapier and Mulesoft. In this class we'll show you everything you need to get started with this simple but powerful tool.

Link
https://www.autodesk.com/autodesk-university/class/Seamless-integration-Forge-Webhooks-2017

Fusion Lifecycle Software's Evented Web Is Off the Hook

Author

Michael Pares, Doug Mclean, Martin Gasevski

Description

This class will explain Fusion Lifecycle software's (formerly Autodesk PLM 360) native support for connecting cloud, on-premise, social, and mobile technology without changing its existing architecture and site configurations—all accomplished with very little administrative effort. We will demonstrate how a product lifecycle management (PLM) site administrator can configure the built-in Evented Web features, and extend such needs programmatically to effortlessly and in real-time interconnect data, people, and processes with numerous other business solutions. This session features PLM 360 (now Fusion Lifecycle) and Fusion Lifecycle.

Link

https://www.autodesk.com/autodesk-university/class/Fusion-Lifecycle-Softwares-Evented-Web-Hook-2016

Smart Workflow: Adding Business Logic to Your Fusion Lifecycle Workflows with Scripting

Author

Michael Vesperman, Fred Smith, Vahid Zohrehvandi

Description

This class will review how your company can achieve true process improvement by methodically analyzing your As-Is process, and identifying redundant steps, bottlenecks, missed activities, and so on. Design a streamlined To-Be process that incorporates decision-making automation of business logic, and enable Fusion Lifecycle software to manage your logic-driven process. This class will be a technical review covering the Fusion Lifecycle application scripting frameworks and API. We will expose students to workspace modeling and scripting techniques that will enable them to automate and streamline their product lifecycle management workflows. This session features PLM 360 (now Fusion Lifecycle) and Fusion Lifecycle.

Link

https://www.autodesk.com/autodesk-university/class/Smart-Workflow-Adding-Business-Logic-Your-Fusion-Lifecycle-Workflows-Scripting-2016