

Synchronizing Change Orders between Vault and Fusion 360 Manage MFG500023

Christian Gessner

Technical Evangelist | COOLORANGE

About the Speaker

Christian Gessner

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 data management 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.

www.coolorange.com



Synchronizing Change Orders between Vault and Fusion 360 Manage

Agenda

- Advantages
- Demo
- Prerequisites
- Installation & Configuration
- Customization Capabilities
- Additional resources



History of powerPLM

Items and
BOMs

Change
Management

2014



Idea was born

coolOrange plays with the idea to connect Vault and PLM360 based on PowerShell cmdlets

2018



Prototype

In collaboration with Autodesk, coolOrange investigates in the topic again and starts developing a Vault-to-Fusion Lifecycle-Connector

2019



vaultFLC

coolOrange releases vaultFLC, a configurable connector with predefined workflows

2020



powerFLC

coolOrange releases powerFLC, a configurable and customizable connector with unlimited workflows

2021



powerPLM

coolOrange renames powerFLC to powerPLM in reaction to Autodesk's product rename to Fusion 360 Manage

Advantages

✉ We decided a new change is needed...

✉ ...there is a new Change Order in Fusion 360 Manage

✉ Can you please work on these changes?

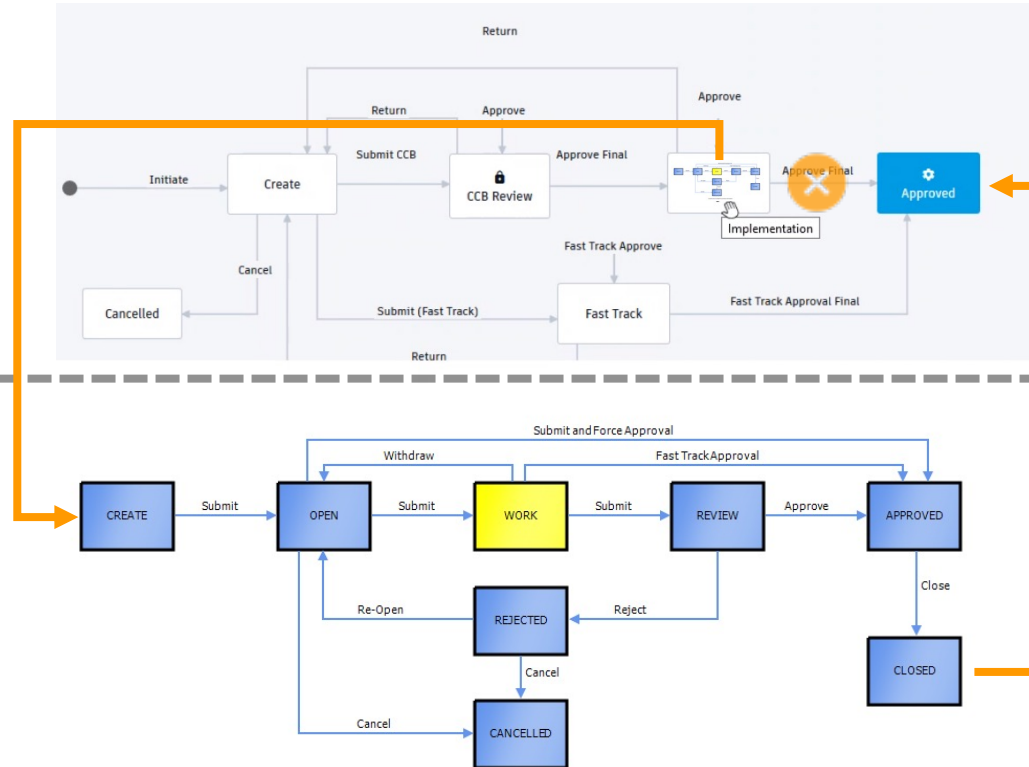
✉ Please note that there are more information attached to the Change Order in Fusion 360 Manage

✉ Please let us know when you guys are ready with all the changes...

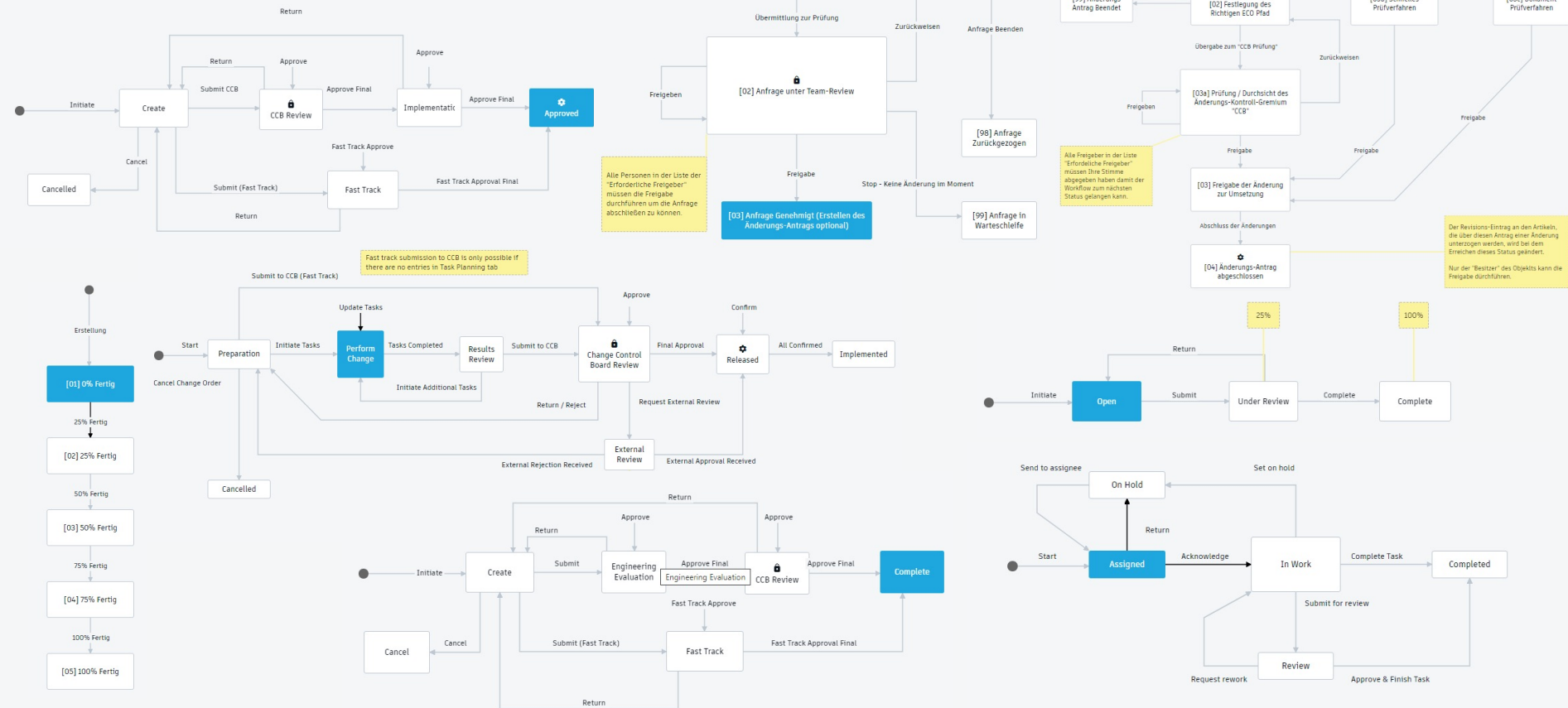
DOES NOT MAKE FUN



Workflow to “outsource” Change Orders to Vault

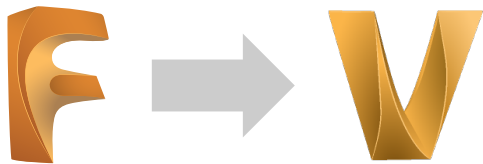


Workflow = Sample



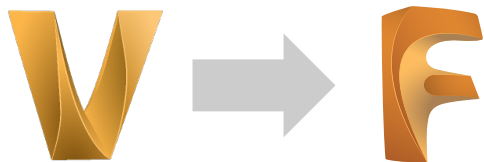
Change Management Workflow

Consists of two major steps



When Fusion 360 Change Orders == predefined state

- Vault ECOs created/updated
 - Item Fields → ECO Properties
 - Affected Items → ECO Records
 - Affected Items not in Vault → ECO comment
 - Change Order Attachments → ECO attachments



When Vault ECO == “Closed”

- Affected Items updated
- “Workflow action” executed
 - Can change Change Order state

Change Management Workflow

Create
Change
Order

Connect
Affected Items

Transition
CO state

Create
ECO & link
items

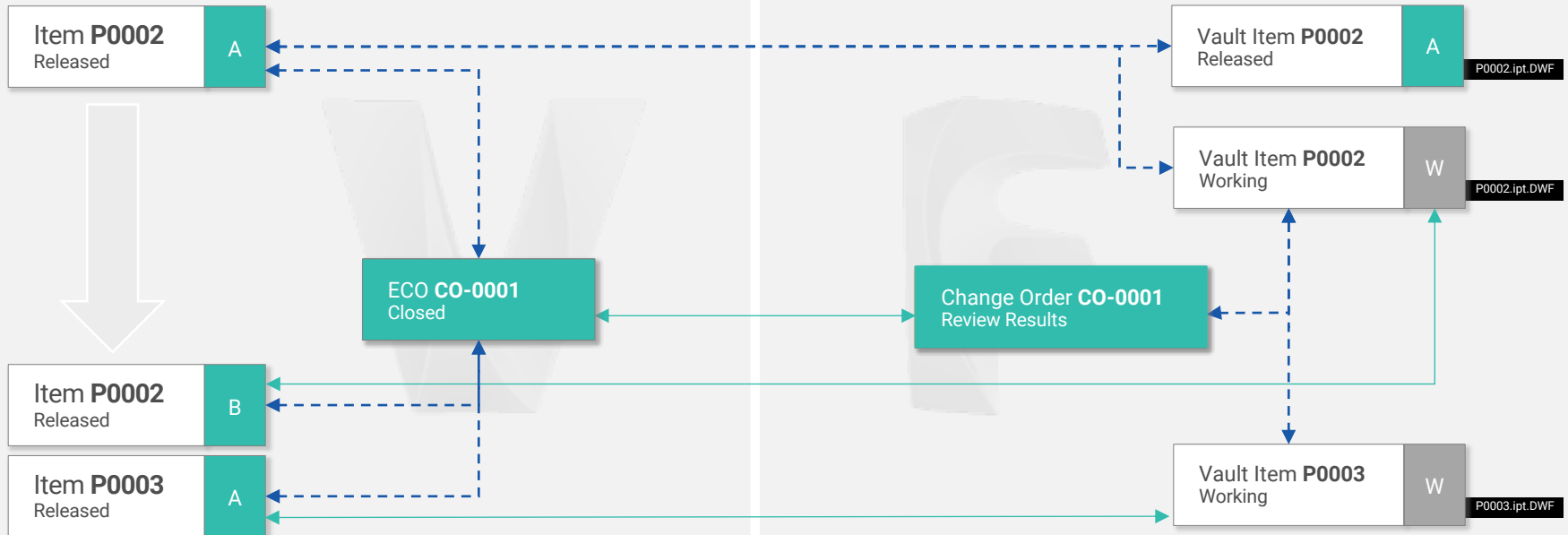
Revise & release
design. Add, attach
and release new data.

Sync Item data
with FLC

Close
ECO

Finish
Task &
Sync
Links

CO
Workflow
Action -
next state



A person is seen from behind, sitting at a desk in a dimly lit server room. They are looking at three computer monitors displaying various data and graphs. In the background, rows of server racks with glowing lights are visible. The word "Demo" is overlaid in white text in the center of the image.

Demo





Prerequisites

Prerequisite

Items- and BOM Workflow

- Items must be transferred by the “Items- and BOM” Workflow in order to be recognized and automatically added to the ECO in Vault



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

Prerequisite

“Affected Items” Type

- Works with **Managed Items** and **Linked Items**
- Does not work with **Item Relationships**
 - Relationships require custom code

The screenshot displays the Autodesk Fusion 360 Manage web application. The left-hand navigation menu is visible, with several items highlighted by green boxes: 'Item Relationships', 'Linked Items', and 'Managed Items'. The main content area is titled 'Managed Items' and contains the following text:

The **Managed Items** tab contains links to the workflow items in a revisioning workspace. Workflow items drive an active item's changes through its lifecycle. The tab name is often changed to **Workflow Items** or **Associated Change Orders**.

In the associated revisioning workspace, the **Linked Items** tab becomes the **Managed Items** tab. It lists the revision-controlled items managed by the active workflow item. Each listed item shows its current lifecycle phase and the managed change with a link to the associated revision (To).

Revision-Controlled Workspaces

Revision-controlled workspaces enforce a special level of control on items. Modifications to these items are done only during specific windows and each set of modifications is captured in a snapshot of the item record called a revision. Each revision represents a phase in the development of that item. When a new revision is created, the previous revision of the item is permanently locked and can not be changed.

Lifecycle Phases

As items are revised, they go through lifecycle phases. These phases and the transitions between them can be tailored by your administrator, but in most cases these phases are:

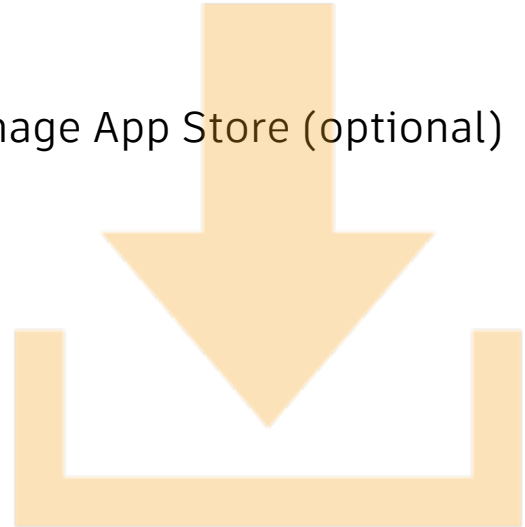
- **Unreleased** – Newly created item in a revision-controlled workspace. It can be modified by anyone with edit rights to the workspace. Unreleased items typically represent a specification/definition of an item or product.
- **In Design (or Working)** – Item is in development. Design iterations create numerical revision numbers for each item.
- **In Production** – Item is released into production.
- **Obsolete** – Item has reached its end of life and is no longer produced.

Below the text, a lifecycle diagram shows the flow between phases: Unreleased, Design, Production, and Obsolete. Transitions include 'Release to Design', 'Design Revision', 'Release to Production', and 'Obsolete'.

Installation & Configuration

Installation & Configuration

- Install “Change Management” app from Fusion 360 Manage App Store (optional)
- Download & Install COOLORANGE powerJobs Processor
- Download & Install COOLORANGE powerPLM
- Start the “Configuration Manager” in Vault
 - Enter Fusion 360 Manage credentials
 - Import workflow(s)
- Adjust workflows
- Configure the triggers
 - powerJobs Processor to periodically check for new and updated Change Orders
 - “Lifecycle Event Editor” to trigger job when Vault ECO transitions to “Close”



Administration App Store

Related figures with the Accident Report App powered by Autodesk Fusion 360 Manage.

[More information](#)

Fusion 360 Manage enables your field technicians to communicate quality issues onsite on any device, and at any time.

[More information](#)

by Autodesk Fusion 360 Manage provides a standardized and repeatable means to manage the RMA process.

[More information](#)

Fusion 360 Manage provides an effective and secure means to distribute, enforce standards, and manage change of your documents.

[More information](#)



Customer Management

The Customer Management App powered by Autodesk Fusion 360 Manage can connect your customer data to all of your processes currently or soon to be managed by Autodesk Fusion 360

[More information](#)



Marketing Asset Management

Marketing Asset Management app can be used for the management, control, tracking, and distribution of brand assets, marketing materials, sales tools and creative materials.

[More information](#)



CE Marking

Use the CE Marking App to manage your approval stages needed for the affixing of the CE marking on your product. Track when the EC Declaration Of Conformity is completed and get a automatically

[More information](#)



Supplier Quarterly Business Review (SQBR)

Supplier Quarterly Business Review (SQBR) helps everyone in the organization to visualize the Supplier Performance.

[More information](#)



Supplier Corrective Action Request (SCAR)

A supplier quality action report (SCAR) was derived from the need to issue suppliers a corrective action to a problem that occurred due to their product or service. As a way to differentiate this from an internal

[More information](#)



Octopart - Item & BOM

The Octopart - Item & BOM app allows you to create part items that link automatically to the Octopart search engine. Octopart develops search technology to help design engineers and part purchasers to find

[More information](#)



Training

Install the Training Workspace to manage employee training with Autodesk Fusion 360 Manage.

[More information](#)



Vault Connector - Items and BOMs

This App compliments coolOrange's powerFLC connector to Vault, providing a flexible solution for both PDM & PLM workflows. Install the Autodesk "Vault Items and BOMs" App to support integration

[More information](#)



Implementation Tracker

Manage Events, Tasks and Documents needed by your global implementation team. Assign tasks and plan both efforts and due dates. Track the progress of your project in real time.

[More information](#)



Claim Management

Manage your customer claims within Autodesk Fusion 360 Manage. Allows claims to be logged and managed by their financial cost to the business. Create claims and assign them to a claim handler for

[More information](#)



Design Reviews

Manage your complete design review processes online, from planning through review documentation to rework and followup reviews. Do not miss any outcome of your reviews and derive corrective tasks

[More information](#)



Change Management

This app provides a repeatable request, review, analysis, and change implementation process that is flexible for a number of typical product related changes.

[More information](#)



New Product Introduction

The NPI App powered by Autodesk Fusion 360 Manage provides an industry standard phase gate process keeping your new product's introduction to the market on schedule and on budget.

[More information](#)



Reminders Utility

Send reminder notifications to responsible users automatically to better meet time schedules.

[More information](#)



Quick Release Processes

Release initial design of your product data in an easy and quick manner to share new designs with downstream processes as early as possible.

[More information](#)



Product Portfolio Management

Build a competitive product portfolio consisting of product lines, categories and product variants. Capture the full specification and lifecycle of your products. Relate your products to New Product

[More information](#)



Quality Management

Quality Management Powered by Autodesk Fusion 360 Manage delivers the tools manufacturers need to collect and analyze quality data, define inspection



Asset Management

Get the tools you need to collect and analyze data related to assets so you can keep them available and in good shape.

Configuration

Unique Identifier

- Used to find out if ECO needs to be created vs. updated
- Vault property must not be changed!

Additionally, Vault “Attributes”
(= hidden properties) are used to save
the Fusion 360 Manage Change Order
ID in Vault

powerFLC - Workflow Settings

General Settings

Workflow Name
Sample.SyncChangeOrders

Fusion Lifecycle Workspace
Change Orders

Vault Entity Type
Change Order

Unique Identifier

Fusion Lifecycle Field
Number

Vault Property
Number

Workflow Settings

Name	Type	Value
Trigger State	FLC State	Perform Change
Affected Items Lifecycle Transition	Text	To Pre-Release
Workflow Action	Text	Update Tasks
Vault Attachments Folder	Vault Folder	\$/Designs/Fusion Lifecycle

Field Mappings

Name	Fusion Lifecycle Field Type	Vault Entity Type
Item Field Mapping	Item Field	Change Order

OK Cancel

Configuration

Trigger State

- Change Order state in Fusion 360 Manage
- Change Orders in this state are created in Vault
- Synchronization triggered periodically

powerFLC - Workflow Settings

General Settings

Workflow Name
Sample.SyncChangeOrders

Fusion Lifecycle Workspace
Change Orders

Vault Entity Type
Change Order

Unique Identifier

Fusion Lifecycle Field
Number

Vault Property
Number

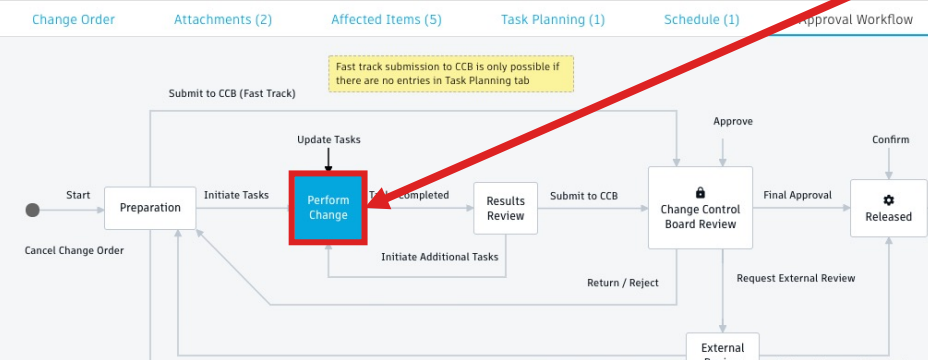
Workflow Settings

Name	Type	Value
Trigger State	FLC State	Perform Change
Affected Items Lifecycle Transition	Text	To Pre-Release
Workflow Action	Text	Update Tasks
Vault Attachments Folder	Vault Folder	\$/Designs/Fusion Lifecycle

Field Mappings

Name	Fusion Lifecycle Field Type	Vault Entity Type
Item Field Mapping	Item Field	Change Order

OK Cancel



Configuration

Affected Items Lifecycle Transition

- Lifecycle of the newly attached Affected Items
- Only applicable if additional records are attached the the Vault ECO
- Required to later execute a “Workflow Action”

Attachments (2)	Affected Items (5)	Task Planning (1)	Schedule (1)	Approval Workflow
<div>Remove ...</div>				
	Lifecycle	Effectivity		
-DOUBLE-WHEEL_ASM - C-BEAM-DOUBLE-WHEEL_ASM.iam [REV:w]	To Pre-Release	On Release		
-WHEEL - MINI-V-WHEEL [REV:w]	To Pre-Release	On Release		
-WHEEL-ASSEMBLY_ASM - MINI-V-WHEEL-ASSEMBLY_ASM.iam [REV:w]	To Pre-Release	On Release		
-WHEEL-XTREME - SOLID-V-WHEEL-XTREME [REV:w]	To Pre-Release	On Release		
-WHEEL-XTREME_ASM - SOLID-V-WHEEL-XTREME_ASM.iam [REV:w]	To Pre-Release	On Release		

powerFLC - Workflow Settings

General Settings

Workflow Name
Sample.SyncChangeOrders

Fusion Lifecycle Workspace
Change Orders

Vault Entity Type
Change Order

Unique Identifier

Fusion Lifecycle Field
Number

Vault Property
Number

Workflow Settings

Name	Type	Value
Trigger State	FLC State	Perform Change
Affected Items Lifecycle Transition	Text	To Pre-Release
Workflow Action	Text	Update Tasks
Vault Attachments Folder	Vault Folder	\$/Designs/Fusion Lifecycle

Field Mappings

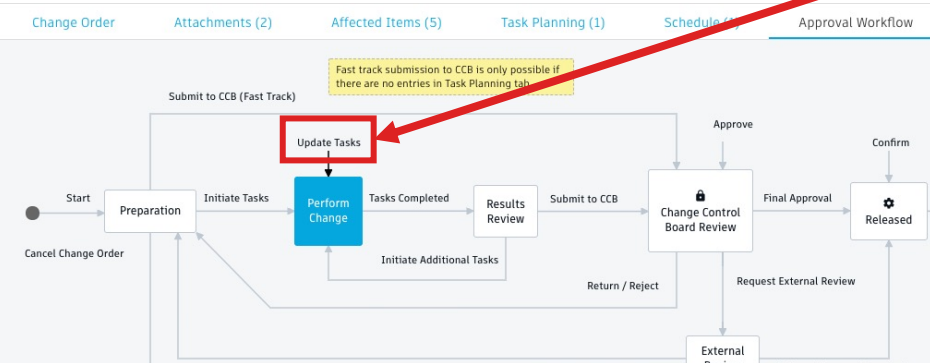
Name	Fusion Lifecycle Field Type	Vault Entity Type
Item Field Mapping	Item Field	Change Order

OK Cancel

Configuration

Workflow Action

- Name of “Workflow Action” that is being executed
- When a Vault ECO is closed
- Can perform a state change



powerFLC - Workflow Settings

General Settings

Workflow Name
Sample.SyncChangeOrders

Fusion Lifecycle Workspace
Change Orders

Vault Entity Type
Change Order

Unique Identifier

Fusion Lifecycle Field
Number

Vault Property
Number

Workflow Settings

Name	Type	Value
Trigger State	FLC State	Perform Change
Affected Items Lifecycle Transition	Text	To Pre-Release
Workflow Action	Text	Update Tasks
Vault Attachments Folder	Vault Folder	\$/Designs/Fusion Lifecycle

Field Mappings

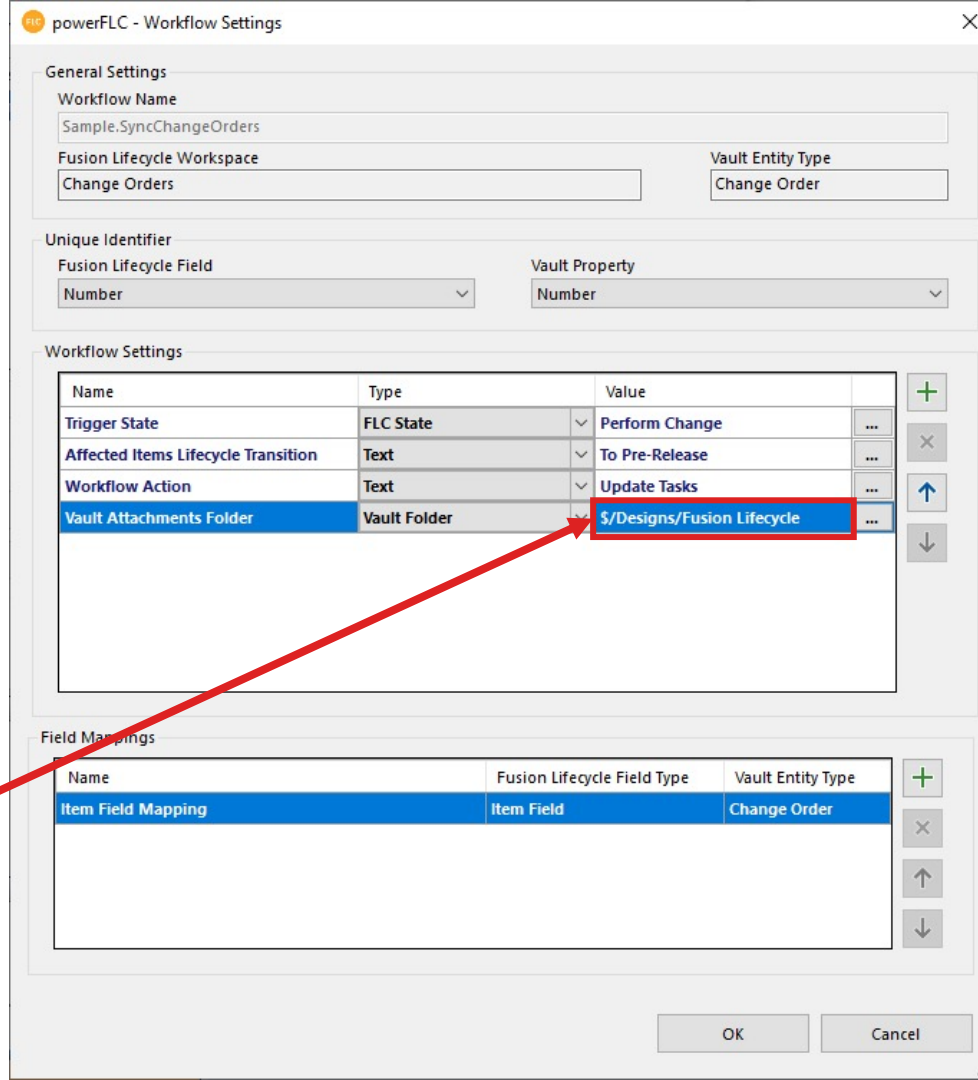
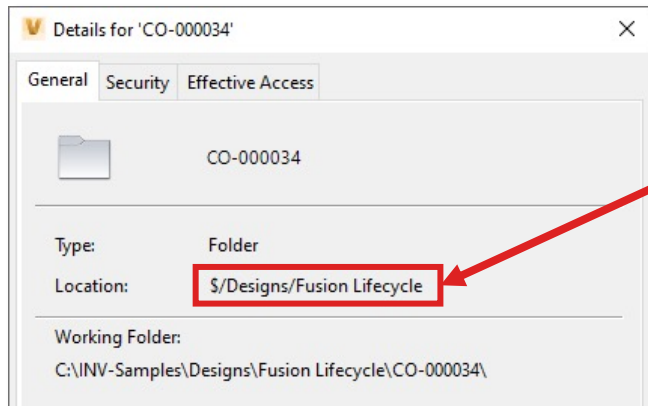
Name	Fusion Lifecycle Field Type	Vault Entity Type
Item Field Mapping	Item Field	Change Order

OK Cancel

Configuration

Vault Attachments Folder

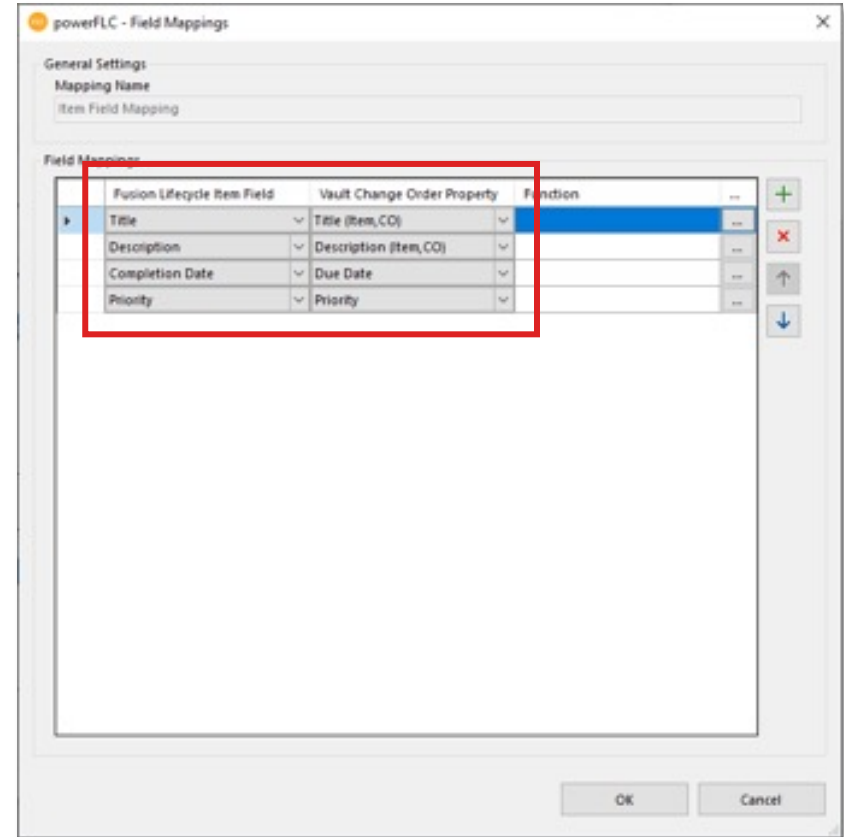
- Attachment location in Vault
- Downloaded from Fusion 360 Manage
- Subfolder = Change Order number



Configuration

Item Field Mapping

- Field Mapping
 - Fusion 360 Manage Change Order field to Vault ECO UDP
- Applied when ECO is
 - Created in Vault
 - Updated in Vault

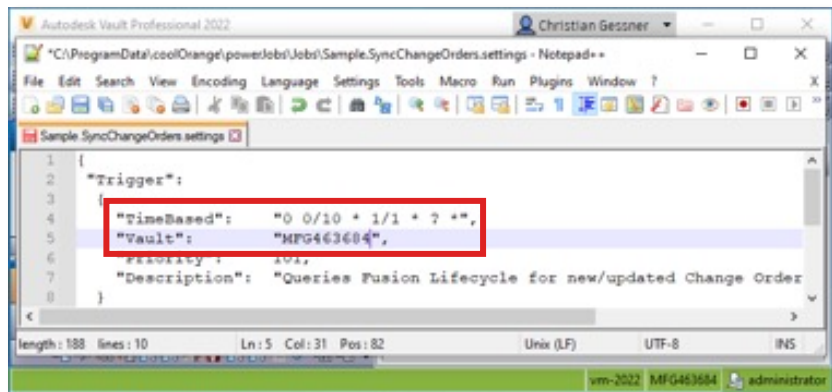


Configuration

Workflow Trigger

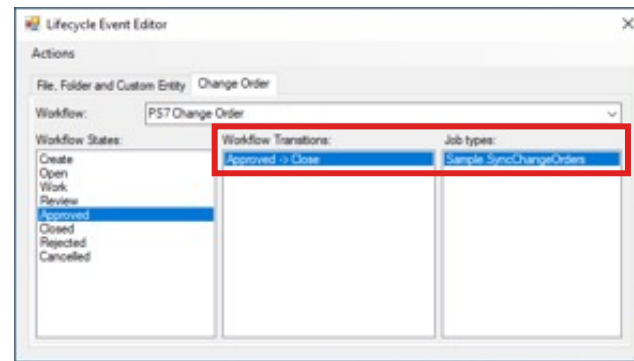
Periodically (every 10 minutes)

- `C:\ProgramData\coolOrange\powerJobs\Jobs\Sample.SyncChangeOrders.settings`
- “TimeBased” = CRON syntax
- “Vault” = name of your Vault



State driven (on Vault ECO close)

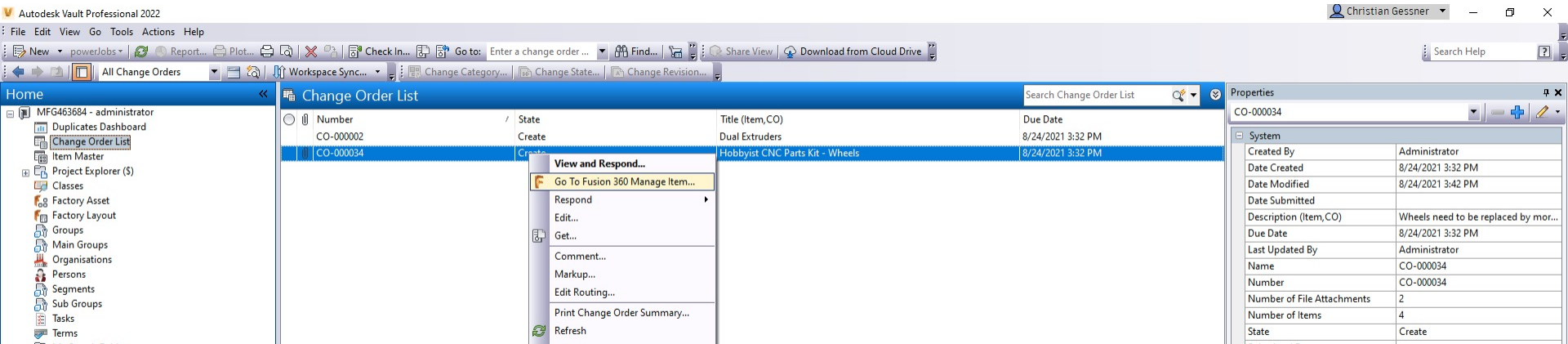
- Lifecycle Event Editor
- “Change Order” tab
- Job type: “Sample.SyncChangeOrders”



Customization Capabilities

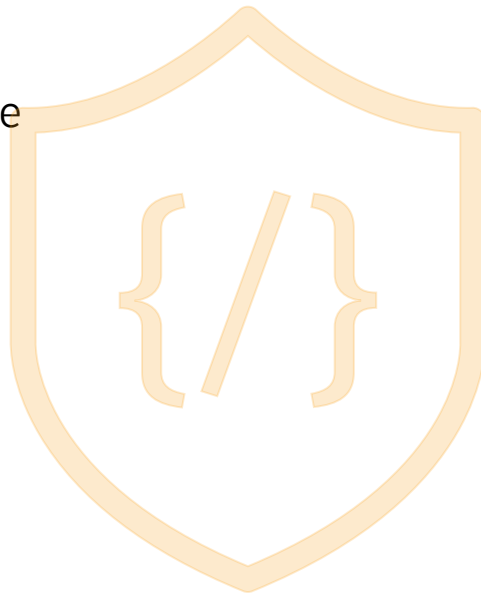
Vault Explorer Extension

- Change Order context menu
 - Go To Fusion 360 Manage Item
- Available on GitHub
 - Source code (C#) + Installer
 - Free
 - <https://github.com/coolOrangeLabs/powerflc-explorer-extension>



Examples how to extend the Workflow

- Use “Change Tasks” instead of “Change Orders”
- Synchronize two or more state changes
- Synchronize UDPs back from Vault to Fusion 360 Manage
- React to “Decline” use cases
 - ECO is “Cancelled” in Vault
 - Change Order is “declined” in Fusion 360 Manage





Additional resources

Workflow Documentation

https://doc.coolorange.com/doku.php?id=powerflc:workflows:change_management

- Workflow descriptions
- Installation
- Configuration
- <https://doc.coolorange.com>

The screenshot shows a web browser window displaying the 'Change Management' workflow documentation on the CoolOrange Wiki. The page title is 'Change Management' and it includes a 'Table of Contents' sidebar with links to 'Change Management', 'Sample SyncChangeOrders', 'Configuration', and 'Triggering the workflow'. The main content area describes the workflow's purpose: to outsource a Change Order from Fusion 360 Manage to Vault. It mentions that the workflow is designed to cover common user scenarios and is easily extendable, using PowerShell and Cmdlets from powerFLC and powerVault. A 'Note' section states that the workflow synchronizes Change Order items from Fusion 360 Manage to Vault once they reach a configured Workflow State. A 'Requirements' section lists three points: the default configuration expects a Fusion 360 Manage workspace named 'Change Orders', the Transfer Item BOMs workflow ensures Vault and Fusion 360 Manage are in a synchronized state before operations, and the default configuration is designed to be used with the Autodesk example PDMC Vault. The page also includes a 'Sample.SyncChangeOrders' section and a 'powerJobs Processor Job' section.

Change Management [coolOrange] x +

doc.coolorange.com/doku.php?id=powerflc:workflows:change_management

coolOrange Wiki

Trace / Change Management

coolOrange Documentation

- ↳ bgpToolkit
- ↳ clever
- ↳ dataLoader
- ↳ License
- ↳ mightyBrowser
- ↳ myFile
- ↳ powerEvents
- ↳ powerFLC
- ↳ Change logs
- ↳ Code Reference
- ↳ Configuration Manager
- ↳ Getting Started
- ↳ Workflows
 - Change Management
 - Transfer Item BOMs
 - Activation and Trial limit
 - Installation
 - Logging
- ↳ powerGate
- ↳ powerGateServer
- ↳ powerJobs Client
- ↳ powerJobs Processor
- ↳ powerVault
- ↳ qJob
- ↳ vaultRuler

[[powerflc:workflows:change_management]]

Change Management

This sample Workflow is meant to display how to outsource a [Change Order](#) from Fusion 360 Manage to Vault.

It is designed to cover common user scenarios and to be easily extendable, because its workflow job is based on PowerShell and makes use of Cmdlets from powerFLC and powerVault. The workflow therefore serves also as a base to create custom workflows.

Note: The workflow synchronizes Change Order items from Fusion 360 Manage → Vault once they reach a configured Workflow State. It creates new representations for them in Vault and handles the assignment of properties, affected items and attachments.

When such Vault Change Orders are closed, the workflow additionally updates the according Change Order item in Fusion 360 Manage and synchronizes its affected items from Vault → Fusion 360 Manage.

Requirements

- The default configuration expects a Fusion 360 Manage workspace named "Change Orders". This workspace must be configured properly in order to allow reading and writing affected items in the [Linked Items Tab](#).
- The Transfer Item BOMs workflow ensures that Vault and Fusion 360 Manage are in a synchronized state before any operations are performed from this workflow.
- In addition, the default configuration is designed to be used with the Autodesk example [PDMC Vault](#).

Sample.SyncChangeOrders

This powerJobs Processor Job performs the synchronization of Change Orders in the following directions:

AU 2020

Joint Effort: Vault and Fusion Lifecycle as the new dream couple

- powerPLM architecture
- Components involved
- Installation and configuration
- Customization
- Items and BOM workflow

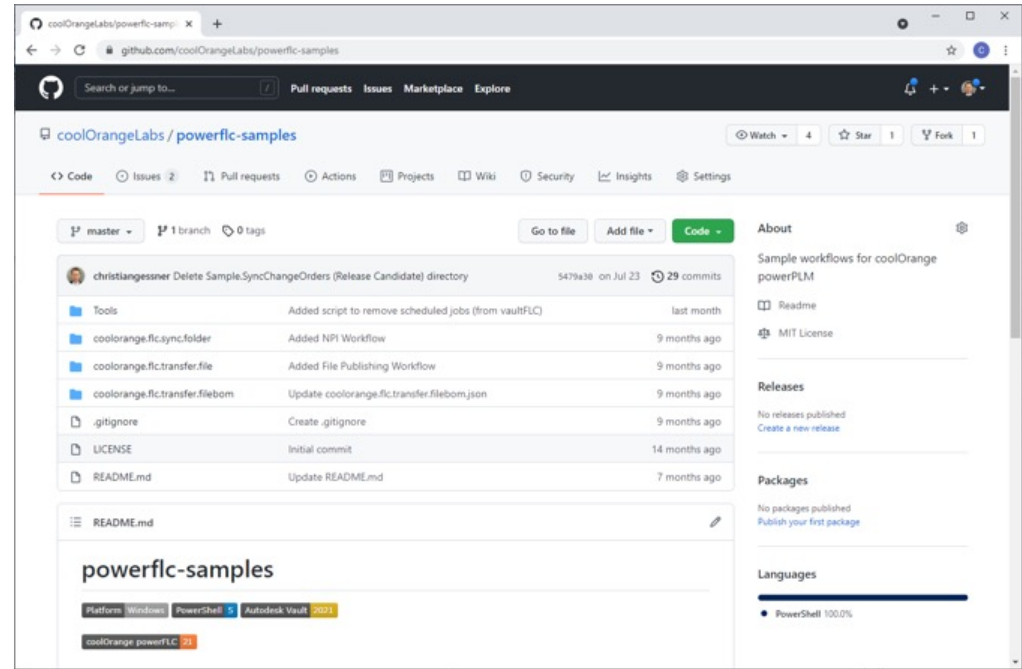


<https://www.autodesk.com/autodesk-university/class/Joint-Effort-Vault-and-Fusion-Lifecycle-New-Dream-Couple-2020>

Additional Workflows

coolOrangeLabs on GitHub

- Repository: **powerflc-samples**
 - NPI (New Product Introduction)
 - File centric Items and BOMs
 - Drawing File synchronization
 - ...
- Additional workflows
 - Please share ideas!!!
- <https://labs.coolorange.com>



The background of the slide features four abstract, dark gray, three-dimensional geometric shapes in the corners. These shapes resemble stylized, faceted crystals or architectural elements, each with sharp edges and reflective surfaces that catch the light, creating bright highlights and deep shadows. They are positioned in the top-left, top-right, bottom-left, and bottom-right corners, framing the central text.

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