SAP Digital Manufacturing Cloud Integration Guide
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1 Planning Information

This Integration Guide is your starting point for integrating SAP Digital Manufacturing Cloud with your system. This guide is a planning tool to help you design your system landscape.

You’ll learn about implementations that are cross-scenario and others that are scenario-specific. You’ll learn about the transfer of information in both directions – from and to SAP Digital Manufacturing Cloud. This guide also looks at business purposes, specific interfaces, sample steps for preparing and transferring information, data mapping between the systems, and troubleshooting aides.

Integration Scenarios

The following Integration Scenarios are available for SAP Digital Manufacturing Cloud:

- Integration Scenarios for SAP Digital Manufacturing Cloud for execution
- Integration Scenarios for SAP Digital Manufacturing Cloud for insights
- Integration Scenarios for Manufacturing Network and SAP Digital Manufacturing Cloud
- Integration Scenarios for Machine Model and SAP Digital Manufacturing Cloud

Example of a Hybrid Digital Manufacturing Landscape

Note

You can find more information about the technical implementation of SAP Digital Manufacturing Cloud and the latest installation and configuration information on the SAP Help Portal at [http://help.sap.com](http://help.sap.com).

→ Recommendation

The business scenarios presented here are examples of how you might use SAP software in your company. The business scenarios are intended only as models and may not run in your specific system landscape.
exactly as they’re described here. Be sure to check your requirements and systems to determine whether these scenarios can be used productively at your site. Also, we recommend that you test these scenarios thoroughly in your test systems to ensure they are complete and free of errors before going live.

This Integration Guide primarily discusses the overall technical implementation of SAP Digital Manufacturing Cloud, and not its subcomponents. This means that additional software dependencies might exist that are not mentioned explicitly in this document.

### 1.1 Minimum Version Requirements

This section describes the minimum release requirements, supported scenarios and limitations for integrating SAP Digital Manufacturing Cloud with SAP ERP, SAP S/4HANA, SAP S/4HANA Cloud, SAP ME, SAP MII or SAP PCo, as well integration with on-premise systems for SAP Manufacturing Insights.

#### 1.1.1 Integration with SAP ERP and SAP S/4HANA

This topic describes the minimum release requirements, supported scenarios, and limitations for integrating SAP Digital Manufacturing Cloud with SAP ERP and SAP S/4HANA.

### Minimum Release Requirements

SAP Digital Manufacturing Cloud is compatible with the following:

- SAP ERP 6.0 EHP 6 or higher
- SAP S/4HANA 1511 onward

**Note**

For LOIPRO05 the compatible versions are SAP ERP 6.0 EHP5 or higher and SAP S/4HANA 1809 onward.

### Scenarios Integrated with SAP Digital Manufacturing Cloud

<table>
<thead>
<tr>
<th>Scenario</th>
<th>SAP ERP</th>
<th>SAP S/4HANA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Production Order</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Process Order</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>
### Scenario

<table>
<thead>
<tr>
<th>Scenario</th>
<th>SAP ERP</th>
<th>SAP S/4HANA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Bill of Materials</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Routing</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Recipe</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Work Center</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Equipment PRT</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Work Instruction at Order Header Level</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Yield/Scrap</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Inventory</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Return Inventory to SAP ERP</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Scrap Inventory to SAP ERP</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Resource Orchestration for Scheduling</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

### Middleware Requirements

- SAP Cloud Integration and Cloud Connector are required as middleware for integration with SAP ERP.
- SAP Cloud Integration in the Neo environment is supported.

### Supported IDocs and Limitations

The table contains an overview of supported IDocs:

<table>
<thead>
<tr>
<th>IDoc</th>
<th>SAP ERP</th>
<th>SAP S/4HANA</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATNAS03</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>BOMMAT04</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>BONMAT05</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>LOIROU04</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>LOIPRO05 (production and process order)</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>
Inventory transfer between storage locations from SAP Digital Manufacturing Cloud isn’t supported.

### 1.1.2 Integration with SAP S/4HANA Cloud

Here are the minimum release requirements, supported scenarios, and limitations for integrating SAP Digital Manufacturing Cloud with SAP Digital Manufacturing Cloud.

#### Minimum Release Requirements

SAP Digital Manufacturing Cloud is compatible with the following:

- SAP S/4HANA Cloud releases 2002 or higher

#### SAP S/4HANA Cloud Objects Integrated with SAP Digital Manufacturing Cloud

<table>
<thead>
<tr>
<th>Object</th>
<th>Integration Scenario</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material</td>
<td>SAP_COM_0009</td>
</tr>
<tr>
<td>Material Classifications</td>
<td>SAP_COM_0163, SAP_COM_0309</td>
</tr>
<tr>
<td>BOM</td>
<td>SAP_COM_0105</td>
</tr>
<tr>
<td>Goods movement</td>
<td>SAP_COM_0108, SAP_COM_0263</td>
</tr>
<tr>
<td>Batch number</td>
<td>SAP_COM_0337</td>
</tr>
<tr>
<td>Recipe and production version</td>
<td>SAP_COM_0519</td>
</tr>
<tr>
<td>Process Order</td>
<td>SAP_COM_0522</td>
</tr>
<tr>
<td>Quality Inspection</td>
<td>SAP_COM_0318</td>
</tr>
</tbody>
</table>
### 1.1.3 Integration with SAP ME

Here are the minimum release requirements, supported scenarios, and limitations for integrating with SAP Manufacturing Execution (SAP ME).

#### Minimum Release Requirements

Resource Orchestration in SAP Digital Manufacturing Cloud can be integrated with SAP ME 15.1SP05 or higher.

**Recommendation**

To use the latest features and developments, integrate with the highest available patch level of the SAP ME or SAP MII release.

#### Scenarios Supported

Here are the supported scenarios:

- Scheduling shop orders in Resource Orchestration and SAP Digital Manufacturing Cloud for execution through the Operator POD in SAP ME
  - Shop orders created in SAP ERP and replicated to SAP ME
  - Shop orders created in standalone SAP ME
  - Re-scheduling shop orders in Resource Orchestration
- Automatically replicating shop orders along with schedules generated in SAP ME to Resource Orchestration.
- Enhancing *SO Step Report* in SAP ME to visualize schedules that include scheduled dates and resource information.
- Releasing orders from Resource Orchestration to SAP ME.

Manual and automatic scheduling modes are supported for all scenarios. For more information about Resource Orchestration, see the [SAP Digital Manufacturing Cloud help portal page](#). On the page, choose the tab [Use Resource Orchestration](#).
Scenarios not Supported

- Operation split in Resource Orchestration and its use in SAP ME.
- Visualization of production progress in Resource Orchestration.

1.1.4 Integration with SAP MII

Here are the minimum release requirements, supported scenarios, and limitations for integrating with SAP Manufacturing Integration and Intelligence (SAP MII).

Minimum Release Requirement

SAP Digital Manufacturing Cloud can be integrated with SAP MII 15.2 or higher.

→ Recommendation
To use the latest features and developments, integrate with the highest available patch level of the SAP MII release.

Scenarios Supported

- OEE Insights in SAP Digital Manufacturing Cloud for insights.
- Analytics provided by SAP Digital Manufacturing Cloud for insights
  See also Standard KPIs by Source System.

1.1.5 Integration with SAP Plant Connectivity

Here are the minimum release requirements, supported scenarios, and limitations for integrating with machinery and equipment on the shop floor with the help of SAP Plant Connectivity.

Minimum Release Requirement

SAP Digital Manufacturing Cloud is compatible with all releases of SAP Plant Connectivity 15.3 SP01 and higher.
→ Recommendation

To use the latest features and developments, install the highest available patch level of the SAP Plant Connectivity release.

For more detailed information on the integration with SAP Plant Connectivity, refer to SAP Note 3113286.

1.1.6 Integration with EWM

Here are the minimum release requirements, supported scenarios, and limitations for integrating SAP Digital Manufacturing Cloud with EWM.

Minimum Release Requirement

SAP Digital Manufacturing Cloud is compatible with EWM that is embedded in SAP S/4HANA 1909 SP01 and higher version.

Scenarios Supported

Single-order staging scenarios, including the following:

- Sending single-order staging request to EWM, triggered by the order release in SAP Digital Manufacturing Cloud.
- Automatically creating floor stock record in the system triggered by single-order staging confirmation from EWM.
- Reporting component consumption to EWM.
- Reporting component removal to EWM.
- Transferring goods receipt to EWM when the container packed with finished goods is closed.

For more information about scenarios, see Integration Scenarios [page 226]. For more information about integration configurations, see Connecting to EWM in SAP S/4HANA 1909 to 2020 [page 210].

1.1.7 Integration with On-Premise Systems for SAP Manufacturing Insights

Here is some information for integration with on-premise systems for SAP Manufacturing Insights.

Prerequisites

- For DMC Data Engineering:
  - Prerequisites
• For SDI:
  SDI Prerequisites
2 Setting Up the Cloud Connector

Configure a cloud connector that acts as a reverse invoke proxy between an on-premises network and SAP Business Technology Platform. The cloud connector comes standard as part of the SAP Cloud Integration service and serves as a link between SAP Business Technology Platform and on-premise systems such as SAP S/4HANA.

In SAP Digital Manufacturing Cloud, the following integration scenarios use a cloud connector:

- **Scenario 1 - Execution2S4 (page 24):** SAP Digital Manufacturing Cloud (execution) → SAP Cloud Integration → cloud connector → SAP S/4HANA
- **Scenario 2 - REO2ME (page 202):** SAP Digital Manufacturing Cloud (resource orchestration) → SAP Cloud Integration → cloud connector → SAP Manufacturing Execution
- **Scenario 3 - PPD/Insights/MM2PCo (page 253):** SAP Digital Manufacturing Cloud (Product Process Designer / insights / Machine Model) → cloud connector → SAP Plant Connectivity
- **Scenario 4 - MN2S4 (page 305):** SAP Digital Manufacturing Cloud (manufacturing network) → cloud connector → SAP S/4HANA

![Diagram of SAP Cloud Connector]

2.1 Install Cloud Connector

**Context**

The installation files for the cloud connector are located at the SAP Development Tools site for cloud.
For all prerequisites and instructions for installing cloud connectors, see the SAP BTP Connectivity documentation.

After the installation, an Administrator user account is automatically created. The initial password is manage. You will be required to change the initial password upon your first login.

### 2.2 Configure Subaccounts in Cloud Connector

For each SAP Business Technology Platform subaccount that you want to connect with an on-premises system, configure a tenant / customer subaccount in the cloud connector.

#### Prerequisites

- You need a subaccount user account to establish the connection between the SAP Business Technology Platform subaccount and the cloud connector. For Cloud Foundry and Neo environments, the requirements vary for this user.
  - For a subaccount in the Cloud Foundry environment, the subaccount user must be a security administrator of the subaccount.
  - For a subaccount in the Neo environment, the subaccount user must have the scope manageSCCTunnels. You can assign the user to the predefined role Cloud Connector Admin or Administrator, or assign the user to a custom role that includes the scope.
- You have configured an HTTP proxy for the cloud connector to reach the Internet. Also, the proxy server must support SSL communication.

> With the cloud connector installed, you can configure the first subaccount and proxy. To do this, on the initial configuration page look for the proxy settings in Connector > Configuration.

#### Context

You always have two separate subaccounts: one for SAP Digital Manufacturing Cloud and one for SAP Cloud Integration.

For the following scenarios, configure the Neo or Cloud Foundry subaccount for SAP Cloud Integration in the cloud connector:
- Execution2S4
- REO2ME

For the following scenarios, configure the Cloud Foundry subaccount for SAP Digital Manufacturing Cloud in the cloud connector:
For more information about these scenarios, see Setting Up the Cloud Connector [page 13].

**Procedure**

1. In a Web browser, as Administrator log on to the cloud connector by using `https://<hostname>:<port>` as `Administrator`.

   **i Note**

   `<hostname>` is the hostname of the machine on which the cloud connector is installed. If you access the cloud connector locally from the same machine, you can just enter `localhost`. For `<port>`, enter the port that you specified during the installation.

   The initial password for `Administrator` is `manage`.

2. Choose `Connector ➔ Add Subaccount`.

3. In the `Add Subaccount` window, enter the following information:

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Region</strong></td>
<td>Select the data center in which the relevant SAP Business Technology Platform sub-account is hosted.</td>
</tr>
</tbody>
</table>
   | **Subaccount** | ○ [Cloud Foundry]: Enter the subaccount ID.  
   ○ [Neo]: Enter the technical name of the subaccount  
   **i Note**
   You can find the subaccount ID or technical name in the subaccount list in the global account or on the overview page of each subaccount. |
   | **Subaccount User** | ○ [Cloud Foundry]: Enter the email address a subaccount user uses to log in the SAP Business Technology Platform cockpit.  
   ○ [Neo]: Enter the P- or S- ID of a subaccount user. |
   | **Password** | Enter the password that the subaccount user uses to log in the SAP Business Technology Platform cockpit |
   | **Location ID** | If you use more than one cloud connector to connect to the same subaccount, define a unique location ID per cloud connector for the subaccount. |

4. Save the subaccount.

5. On the **Subaccount Dashboard**, in the **Actions** column, choose `')(Connect this subaccount)` for this subaccount.
Results

The status of the subaccount is shown as *Connected* in the cloud connector.

In addition, you can verify the connection status in the SAP Business Technology Platform cockpit for your subaccount (Connectivity Cloud Connectors). The status should also be shown as *Connected*.

Related Information

Configure trust to SAP Digital Manufacturing Cloud if you maintain a whitelist of cloud applications that can use the cloud connector

Initial Configuration

Cloud Foundry: Add Organization Members Using the Cockpit

Neo: Add Members to Your Subaccount

2.3 Configure Access Control

Expose the on-premise systems to the cloud and specify the resources accessible from the cloud.

Context

To expose an on-premise system, create a virtual system in the cloud connector and map it to an internal on-premise system. When making the configuration, you need to define a virtual host and a virtual port for the virtual system. The virtual host and port will be used for identifying the on-premise systems when creating destinations in the corresponding SAP Business Technology Platform subaccount.

In addition, you must specify the resources that are accessible from the cloud. This step is required even if you don’t limit access to resources. In other words, you need to explicitly specify that all resources are accessible.

For more information about the different scenarios mentioned below, see Setting Up the Cloud Connector [page 13].

Procedure

1. In the cloud connector administration console, choose <Subaccount> Cloud To On-Premise ACCESS CONTROL.

2. In the Mapping Virtual To Internal System section, choose + (Add).

   A wizard appears, guiding you through all the required settings.
3. In the wizard, enter the information according to the protocol used for communication and the specific on-premise system.
   
   ○ To communicate with SAP S/4HANA over the RFC protocol, follow the instructions at Configure Access Control (RFC).
     Applicable scenario: Execution2S4
   
   ○ To communicate with SAP S/4HANA, SAP Manufacturing Execution, or SAP Plant Connectivity over the HTTPS protocol, follow the instructions at Configure Access Control (HTTP).
     Applicable scenarios: REO2ME, SFD/Insights/MM2PCo, MN2S4

   For the back-end type and principal type system, see the following table:

<table>
<thead>
<tr>
<th>On-Premise System</th>
<th>Back-end Type</th>
<th>Principal Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAP S/4HANA</td>
<td>ABAP System</td>
<td>None</td>
</tr>
<tr>
<td>SAP Manufacturing Execution</td>
<td>SAP Application Server Java</td>
<td>None</td>
</tr>
<tr>
<td>SAP Plant Connectivity</td>
<td>Other SAP System</td>
<td>X.509 Certificate (General Usage) or X.509 Certificate (Strict Usage)</td>
</tr>
</tbody>
</table>

   **Note**

   The virtual host and virtual port can be freely defined. However, you cannot edit the virtual host or virtual port after you’ve added the mapping.

4. To specify resources that are accessible from the cloud, add the resources for the system.

   You can find detailed instructions at Configure Accessible Resources. In addition, for the required configurations for each integration scenario, see the following table:

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Execution2S4</td>
<td>Resource 1</td>
<td>Function Name Enter CO_MES_PRODORDCONF_CREATE_TT</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Enabled Select the checkbox.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Naming Policy Select Exact Name.</td>
</tr>
<tr>
<td></td>
<td>Resource 2</td>
<td>Function Name Enter CO_MES_STANDARD_VALUE_KEY_PULL</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Enabled Select the checkbox.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Naming Policy Select Exact Name.</td>
</tr>
<tr>
<td></td>
<td>Resource 3</td>
<td>Function Name Enter MB_MES_GOODSMVT_CREATE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Enabled Select the checkbox.</td>
</tr>
</tbody>
</table>
### Scenario

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Naming Policy</td>
<td>Select Exact Name.</td>
</tr>
<tr>
<td><strong>Resource 4</strong></td>
<td></td>
</tr>
<tr>
<td>Function Name</td>
<td>Enter QIRF_SEND_CATALOG_DATA2</td>
</tr>
<tr>
<td>Enabled</td>
<td>Select the checkbox.</td>
</tr>
<tr>
<td>Naming Policy</td>
<td>Select Exact Name.</td>
</tr>
<tr>
<td><strong>Resource 5</strong></td>
<td></td>
</tr>
<tr>
<td>Function Name</td>
<td>Enter BAPI.</td>
</tr>
<tr>
<td>Enabled</td>
<td>Select the checkbox.</td>
</tr>
<tr>
<td>Naming Policy</td>
<td>Select Prefix.</td>
</tr>
<tr>
<td>SFD/Insights/MM2PCo</td>
<td></td>
</tr>
<tr>
<td>URL Path</td>
<td>Enter /cloudservices.</td>
</tr>
<tr>
<td>Enabled</td>
<td>Select the checkbox.</td>
</tr>
<tr>
<td>Access Policy</td>
<td>Select Path and all sub-paths.</td>
</tr>
<tr>
<td>REO2ME and MN2S4</td>
<td></td>
</tr>
<tr>
<td>URL Path</td>
<td>Enter /</td>
</tr>
<tr>
<td>Enabled</td>
<td>Select the checkbox.</td>
</tr>
<tr>
<td>Access Policy</td>
<td>Select Path and all sub-paths.</td>
</tr>
</tbody>
</table>

### Results

In the SAP Business Technology Platform cockpit for the corresponding subaccount (Connectivity Cloud Connectors Exposed Back-End Systems), you can find the accessible resource configuration.

### 2.4 Set Up Mutual Authentication with On-Premise Systems

To set up mutual authentication between the cloud connector and an on-premise system, import an X.509 client certificate into the cloud connector. The certificate must be issued for the fully qualified domain name (FQDN) of the computer on which the cloud connector is installed. The cloud connector will then use this so-called "system certificate" for all HTTPS requests to back-ends that request or require a client certificate.

### Related Information

Install a System Certificate for Mutual Authentication
2.5 Configure User Authentication Against On-Premise Systems

To secure the communications with an on-premise system, apply different user authentication methods according to the integration scenario you use.

**Context**

For more information about the scenarios below, see Setting Up the Cloud Connector [page 13].

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Authentication Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Execution2S4</td>
<td>Basic authentication using destinations</td>
</tr>
<tr>
<td></td>
<td>For more information about how to create the destinations, see Set Up Connection Between SAP Cloud Integration, Cloud Connector and SAP S/4HANA [page 48].</td>
</tr>
<tr>
<td>REO2ME</td>
<td>Basic authentication using destinations</td>
</tr>
<tr>
<td></td>
<td>For more information about how to create the destinations, see Integrating Resource Orchestration to SAP Manufacturing Execution On-Premise (Outbound) [page 203].</td>
</tr>
<tr>
<td>SFD/Insights/MM2PCo</td>
<td>Principal propagation using an X.509 CA certificate</td>
</tr>
<tr>
<td></td>
<td>The certificate must be issued for the fully qualified domain name (FQDN) of the computer where the cloud connector is installed.</td>
</tr>
<tr>
<td></td>
<td>If you use a self-signed certificate, be sure to place the public key in the Trusted store location in the file system of the SAP Plant Connectivity server: C:\ProgramData\SAP\PCo\CertificateStores\CloudServicesHost\Trusted\certs. You can obtain the public key choosing Download certificate in DER format.</td>
</tr>
<tr>
<td></td>
<td>For more information, see Configure a CA Certificate for Principal Propagation.</td>
</tr>
<tr>
<td>MN2S4</td>
<td>Basic authentication using destinations</td>
</tr>
<tr>
<td></td>
<td>For more information about how to create the destinations, see On-Premises System Destination Properties [page 319].</td>
</tr>
</tbody>
</table>
Related Information

Authenticating Users against On-Premise Systems
3 Manufacturing Execution Integration

SAP Digital Manufacturing Cloud for execution supports various integration scenarios. The supported systems include both on-premise and cloud systems.

**Execution Scenarios**

The integration scenarios are supported by different systems, as follows:

<table>
<thead>
<tr>
<th>Integration Scenarios</th>
<th>ERP System</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Integration between SAP Digital Manufacturing Cloud for execution and SAP S/4HANA Cloud</strong></td>
<td>*</td>
</tr>
</tbody>
</table>

* Integration between SAP Digital Manufacturing Cloud for execution and SAP S/4HANA Cloud
### Integration with SAP S/4HANA Cloud

**Integrated Systems**
- SAP S/4HANA Cloud
- SAP Digital Manufacturing Cloud for execution

**Scenario**
- Master Data – Material, BOM, Recipe integration
- Transaction Data – Integration of Process Order, Goods Issue, Goods Receipt, Yield/Scrap confirmation, and Activity Confirmation

For more information, see Connecting to SAP S/4HANA Cloud [page 132].

### Integration with SAP S/4HANA or SAP ERP

**Integrated Systems**
- SAP S/4HANA or SAP ERP
- SAP Digital Manufacturing Cloud for execution
- Cloud Connector
- SAP Cloud Integration

**Scenario**
- Master Data – Material, BOM, Recipe integration
• Transaction Data – Production Order integration and Yield/Scrap confirmation

For more information, see Integration with SAP ERP or SAP S/4HANA [page 24]

Resource Orchestration Integration with SAP ME

Integrated Systems

• SAP S/4HANA or SAP ERP
• SAP Digital Manufacturing Cloud for execution
• SAP Cloud Integration
• Cloud Connector
• SAP ME

Scenario

For more information, see Integration with Resource Orchestration [page 202]

SAP Digital Manufacturing Cloud for Execution Integration with SAP AIN

Integrated Systems

• SAP S/4HANA or SAP S/4HANA Cloud or SAP ERP
• SAP Digital Manufacturing Cloud for execution
• SAP Cloud Integration
• Cloud Connector
• SAP AIN

Scenario

For more information on this scenario, see Integration with SAP Asset Intelligence Network [page 199]

Integration with SAP EWM

Integrated Systems

• SAP S/4HANA
• SAP Digital Manufacturing Cloud for execution
• SAP Cloud Integration
• Cloud Connector
• SAP EWM embedded in SAP S/4HANA

Scenario

For more information on this scenario, see EWM Integration Scenarios [page 226].

3.1 Units of Measure for DMC

Materials and other business objects are downloaded to DMC with their base units of measure (UoMs), as well as alternate units, by sending ISO codes to the DMC UOM Service (product-ms). The DMC UOM Service converts internal units into commercial units.

DMC supports the following unit of measure functionality features:
Standard units of measure are supported while custom units of measure are not supported.

Only internal units marked as primary ISO codes are converted into commercial units.

The commercial unit is displayed on the screen in the local language. For example, the abbreviation for “bottle” in English is BT while in German it is FL. The commercial unit abbreviation is language-dependent.

3.2 Integration with SAP ERP or SAP S/4HANA

SAP Digital Manufacturing Cloud for execution uses SAP Cloud Integration to communicate with external SAP ERP or SAP S/4HANA systems. You can connect various ERP systems, for example one system per plant or country. The global SAP Digital Manufacturing Cloud for execution system is used across all plants.

**i Note**

If you integrate SAP Digital Manufacturing Cloud for execution with multiple SAP S/4HANA systems, these systems need to have different System IDs. Systems are identified at the client level.

**i Note**

If you need to maintain multiple plants, each plant needs to have a unique plant name across the tenant.

**i Note**

If you integrate multiple SAP Digital Manufacturing Cloud tenants to ERP systems, you need multiple SAP Cloud Integration tenants. For example, you need one SAP Cloud Integration tenant for your SAP Digital Manufacturing Cloud quality tenant and another one for your SAP Digital Manufacturing Cloud production tenant. Both SAP Cloud Integration tenants can be used for other cloud products/applications, too.

After you have completed the onboarding procedures as mentioned in the Onboarding and User Management, you can continue with the configurations that are required to build up connectivity between SAP Digital Manufacturing Cloud and integrated SAP S/4HANA. For detailed steps, see Connecting to SAP S/4HANA [page 25].

Integration with SAP S/4HANA enables data transfer of various types between the systems. These data types can be largely categorized into master data and transactional data. To trigger the transfer of these data, you need to make sure prerequisites are met and required configurations are set up. For more information, see Integration Scenarios [page 50].

**Related Information**

- Manage Plants
- Restrictions and Limitations [page 131]
3.2.1 Connecting to SAP S/4HANA

Here are the administrative configurations that need to be set up to enable communication between SAP Digital Manufacturing Cloud for execution and SAP S/4HANA.

Integration Overview

As the On-Premise Enterprise Network environment is protected by a firewall, an asymmetrical communication design connects SAP Digital Manufacturing Cloud for execution to SAP S/4HANA.

- Build HTTP Connection [page 34]
- Set Up Data Replication Framework (DRF) [page 36]
- Connect SAP Cloud Integration to SAP Digital Manufacturing Cloud [page 41]
- Connect SAP Digital Manufacturing Cloud to SAP Cloud Integration [page 44]
- Install Cloud Connector [page 47]
- Set Up Connection Between SAP Cloud Integration, Cloud Connector and SAP S/4HANA [page 48]
- Configure SAP Digital Manufacturing Cloud for Outbound Integration [page 49]

From SAP S/4HANA to SAP Digital Manufacturing Cloud for execution, HTTPS is used to connect SAP Cloud Integration (previously called CPI). SAP Cloud Integration parses and sends the transaction to SAP Digital Manufacturing Cloud for execution for processing. Transaction examples: material import and production import.

From SAP Digital Manufacturing Cloud for execution to SAP S/4HANA, an RFC is used to call SAP S/4HANA BAPI from the SAP Cloud Connector. Transaction examples: production yield confirmation and production scrap confirmation.
Prerequisites

Before enabling integration with SAP S/4HANA, ensure that you have already completed the following prerequisite steps:

- Complete the onboarding process
- Download SAP Cloud Integration package
- Grant your P-User access to SAP Cloud Integration [page 27]
- Upload SSL certificates [page 28]
- Know how to access SAP Cloud Integration [page 30]

3.2.1.1 Prerequisites

This page shows you the prerequisite steps that must be completed before configuring integration with SAP S/4HANA.

The required steps are:

- Grant User Access to SAP Cloud Integration [page 27]
- Upload SSL Certificates [page 28]

Next Steps

- Build HTTP Connection [page 34]
- Set Up Data Replication Framework (DRF) [page 36]
- Connect SAP Cloud Integration to SAP Digital Manufacturing Cloud [page 41]
- Connect SAP Digital Manufacturing Cloud to SAP Cloud Integration [page 44]
- Install Cloud Connector [page 47]
- Set Up Connection Between SAP Cloud Integration, Cloud Connector and SAP S/4HANA [page 48]
- Configure SAP Digital Manufacturing Cloud for Outbound Integration [page 49]
3.2.1.1.1 Grant User Access to SAP Cloud Integration

Before building up connectivity with SAP S/4HANA, you must first have a P-User ID and grant it access to SAP Cloud Integration.

To obtain a P-User ID, go to www.sap.com and register a new user using his or her email address.

If a user has already been registered with the SAP ID service (for example, at SAP Community or SAP Developer Center) using the same email address, the user does not need to register again.

Prerequisites

You have the Administrator role for the subaccount. You have the user IDs of the members that you want to add.

Procedure

Authorizing Users for SAP Cloud Integration on Cloud Foundry Environment

For detailed procedures, see SAP Note 3021072.

Authorizing Users for SAP Cloud Integration on Neo Environment

To grant P-User authorization to access SAP Cloud Integration, follow these steps:

1. In SAP BTP Cockpit, select your subaccount and then choose Members.
2. Choose Add Members.
3. In the User IDs field, enter the P-User ID, and assign roles to the member.

5. You can either assign roles to individual users on the Users tab, or create user groups on the Groups tab and assign the role group to users.

6. To add new administrators, make sure the users have been assigned the following roles:
   - ESBMessaging.send
   - AuthGroup.BusinessExpert
   - AuthGroup.Administrator
   - AuthGroup.IntegrationDeveloper

---

**Related Information**

How to Get SAP Cloud Integration Management URL [page 30]

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### 3.2.1.1.2 Upload SSL Certificates

This page shows you how to upload SSL certificates to build the trust between the systems.

The certificate uploading processes mentioned below apply to SAP Cloud Integration in both Neo and Cloud Foundry environments.

#### Upload SSL Certificate of SAP Cloud Integration to SAP ERP or SAP S/4HANA

#### Download SAP Cloud Integration Certificate

1. Go to SAP Cloud Integration Web UI URL. This is also the management URL of SAP Cloud Integration. For details, see How to Get SAP Cloud Integration Management URL [page 30].
2. Choose the lock icon in the address bar to download the SSL certificate of SAP Cloud Integration.

Upload Certificate to SAP ERP or SAP S/4HANA

1. Log on to the SAP ERP or SAP S/4HANA system as an Administrator.
2. Use the transaction STRUST to access Trust Manager.
3. Upload the certificate you saved in previous steps to SSL client SSL Client (Standard) node.

Upload SSL Certificate of SAP Digital Manufacturing Cloud to SAP Cloud Integration

Download SAP Digital Manufacturing Cloud Certificate

1. Log on to SAP BTP Cockpit and go to SAP Digital Manufacturing Cloud Execution SaaS Tenant.
2. Choose the lock icon in the address bar to download the certificate.
### Upload Certificate to SAP Cloud Integration

For more information, see [Importing a Certificate](#).

### 3.2.1.1.3 How to Get SAP Cloud Integration Management URL

This page shows how to get the management URL of SAP Cloud Integration.

#### Prerequisites

You need to be a member of the global account in order to access the instances and subscriptions of SAP Cloud Integration tenant and get the management URL.

#### Get SAP Cloud Integration Management URL (Cloud Foundry Environment)

1. In SAP BTP Cockpit, select your subaccount and then choose *Instances and Subscriptions*.
2. In the *Integration Suite* subscription, choose the more button, and then choose *Go to Application*.
3. Choose the tile *Design, Develop and Operate Integration Scenarios* to enter the management URL.
Get SAP Cloud Integration Management URL (Neo Environment)

1. In SAP BTP Cockpit, select your subaccount and then choose Applications ➤ Subscriptions.
2. In the Subscribed Java Applications section, choose the <Cloud Integration tenant>tmn application.
3. In the Application URLs section, you will see the management URL named https://<Cloud Integration tenant>-tmn.avt.eu1.hana.ondemand.com.

Related Information

Grant User Access to SAP Cloud Integration [page 27]
How to Get SAP Cloud Integration Runtime URL [page 32]
### 3.2.1.1.4 How to Get SAP Cloud Integration Runtime URL

This page shows how to get the runtime URL of SAP Cloud Integration.

**Prerequisites**

You need to be a member of the global account in order to access the instances and subscriptions of Cloud Integration tenant and get the runtime URL.

**Get SAP Cloud Integration Runtime URL (Cloud Foundry Environment)**

1. In SAP BTP Cockpit, select your subaccount and then choose *Instances and Subscriptions*.
2. In the *Instances* tab, find the instance for the *Process Integration Runtime* service and choose the key.
3. In the key credentials pop-up, you can see the runtime URL under the `url` tag.
Get SAP Cloud Integration Runtime URL (Neo Environment)

1. In SAP BTP Cockpit, select your subaccount and then choose **Applications > Subscriptions**.

2. In the **Subscribed Java Applications** section, choose the <Cloud Integration tenant>iflmap application.

3. In the **Application URLs** section, you will see the runtime URL named https://<Cloud Integration tenant>-iflmap.avtsbhf.eu1.hana.ondemand.com.
Related Information

How to Get SAP Cloud Integration Management URL [page 30]

3.2.1.2 Build HTTP Connection

If you want to allow SAP S/4HANA to access data from SAP Cloud Integration, you need an HTTP connection for the communication.

Procedure

1. In SAP S/4HANA, run transaction code SM59 to enter the Configuration of RFC Connections screen.
2. Choose Edit Create.
3. Enter the following general data:
   ○ RFC Destination: Name of the HTTP connection
   ○ Connection Type: G (HTTP Connection to External Server)
4. In the Technical Settings tab, enter data for the fields as follows:
<table>
<thead>
<tr>
<th>Field</th>
<th>Example</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Target Host</td>
<td>&lt;Cloud Integration tenant&gt;-ifl-map.avtsbf.eu1.hana.ondemand.com</td>
<td>SAP Cloud Integration runtime URL that is sent by the provisioning email when the space is created. Alternatively, you can get the runtime URL in the SAP BTP Cockpit. For more information, refer to How to Get SAP Cloud Integration Runtime URL [page 32].</td>
</tr>
<tr>
<td>Port</td>
<td>443</td>
<td></td>
</tr>
<tr>
<td>Path Prefix</td>
<td>/cxf/GenericMessageProcessor_00</td>
<td>The service implemented on SAP Cloud Integration to receive the message/IDOC from SAP S/4HANA.</td>
</tr>
<tr>
<td>Proxy Host</td>
<td>proxy.wdf.sap.corp</td>
<td>The proxy host for the external system connection.</td>
</tr>
<tr>
<td>Proxy Service</td>
<td>8080</td>
<td>The proxy service for the external system connection.</td>
</tr>
</tbody>
</table>

5. In the Logon & Security tab, complete the following settings.
   1. Choose Basic Authentication, and enter the User and Password. Use the P-User account authorized in SAP Cloud Integration.

<table>
<thead>
<tr>
<th>i Note</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>To obtain a P-User ID, see Grant User Access to SAP Cloud Integration [page 27].</td>
</tr>
</tbody>
</table>

   2. Activate SSL, and in SSL Certificate field, keep the default value DEFAULT SSL Client (Standard).

6. Choose Connection Test to test the connection between SAP S/4HANA and SAP Cloud Integration.

<table>
<thead>
<tr>
<th>i Note</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>If the GenericMessageProcessor iFlow has been deployed in SAP Cloud Integration, the Status HTTP Response shows the value 500, which indicates a successful connection. Otherwise, an error message is displayed.</td>
</tr>
</tbody>
</table>
### 3.2.1.3 Set Up Data Replication Framework (DRF)

You can use the Data Replication Framework (DRF) to send master and transaction data from SAP S/4HANA to SAP Digital Manufacturing Cloud for execution using IDocs.

You configure all following settings in SAP S/4HANA.

1. Define a logical system.
   1. Use transaction BD54 and define the logical system for the SAP ERP system.
   2. Define the logical system for SAP Digital Manufacturing Cloud for execution.
2. Use the transaction SCC4 to assign the SAP ERP logical system created in above step to a real SAP ERP client.
3. Define ports for outbound communication.
   1. Use transaction WE21.
   2. In XML HTTP, choose the RFC destination created by SM59 in Build HTTP Connection.
4. Assign the logical system to the logical partner system in the partner profile, and define outbound message types. This assignment is used to determine the target system and to transfer the data by using a synchronized RFC.
   1. Use transaction WE20 to create a new logical partner system under Partner Type LS.
   2. In Partner No., enter the logical system you created in the previous step. Enter US in Ty.. <SAP ERP user> in Processor, and EN in Lang.
   3. In the Outbound table, choose Create outbound parameter.
   4. On the Partner Profiles: Outbound Parameters screen, select Pass IDoc Immediately and Cancel Processing After Syntax Error, and enter data in the following fields:

<table>
<thead>
<tr>
<th>Field</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Message Type</td>
<td>BOMMAT</td>
</tr>
<tr>
<td>Receiver port</td>
<td>HCI_DME</td>
</tr>
<tr>
<td>Pack. Size</td>
<td>1</td>
</tr>
<tr>
<td>Basic type</td>
<td>BOMMAT05</td>
</tr>
</tbody>
</table>

5. Repeat steps 'c' and 'd' to add the following parameters:

<table>
<thead>
<tr>
<th>Message Type</th>
<th>Receiver Port</th>
<th>Basic Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>INVCON</td>
<td>HCI_DME</td>
<td>INVCON03</td>
</tr>
<tr>
<td>LOIPRO</td>
<td>HCI_DME</td>
<td>LOIPRO05 (production order and process order)</td>
</tr>
<tr>
<td>LOIROU</td>
<td>HCI_DME</td>
<td>LOIROU04</td>
</tr>
</tbody>
</table>
5. Define a distribution model for the IDoc message types.
   1. Use transaction BD64.
   2. On the Display Distribution Model screen, choose Switch Between Display and Edit Mode.
   3. Choose Create Model View and enter data in the following fields:

<table>
<thead>
<tr>
<th>Field</th>
<th>Example</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Short Text</td>
<td>DMEModel</td>
<td>The name of the model</td>
</tr>
<tr>
<td>Technical Name</td>
<td>DMEModel</td>
<td>The technical name of the model</td>
</tr>
<tr>
<td>Start Date</td>
<td></td>
<td>The current date</td>
</tr>
<tr>
<td>End Date</td>
<td>31.12.9999</td>
<td></td>
</tr>
</tbody>
</table>

4. Choose the model view you created in the Model Views list and then choose Add Message Type. Make the following entries:

<table>
<thead>
<tr>
<th>Field</th>
<th>Example</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model View</td>
<td>DEMMODEL</td>
<td>Technical</td>
</tr>
<tr>
<td>Sender</td>
<td>S4HCLNT100</td>
<td>Your sending logical system.</td>
</tr>
<tr>
<td>Receiver</td>
<td>DMETest</td>
<td>Your receiving logical system.</td>
</tr>
</tbody>
</table>
5. Choose **Continue**.
6. Repeat steps d and e to add the following message types:

<table>
<thead>
<tr>
<th>Message Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>INVCON</td>
<td>Inventory controlling IDOC</td>
</tr>
<tr>
<td>LOIPRO</td>
<td>Production / process order</td>
</tr>
<tr>
<td>LOIROU</td>
<td>Routing</td>
</tr>
<tr>
<td>LOIWCS</td>
<td>Work center</td>
</tr>
<tr>
<td>MATMAS</td>
<td>Material master</td>
</tr>
</tbody>
</table>

**Note**

To add message type **EQUIPMENT_CREATE**, in step d, select the model view you created and choose **Add BAPI** instead of **Add Message Type**. Enter the values described in step d for **Model View**, **Sender / Client** and **Receiver / Server**. Select **Equipment** in **Object / Interface** and **Create** in **Method**.
7. Choose Save.

   1. Use the DRFIMG transaction and choose **Define Custom Settings for Data Replication** ➔ **Define Technical Settings** ➔ **Define Technical Settings for Business Systems**
   3. On the New Entries: Overview of Added Entries screen, choose Unicode, and enter data in the following fields to create a business system:

<table>
<thead>
<tr>
<th>Field</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business System</td>
<td>DMESystem</td>
</tr>
<tr>
<td>Logical System</td>
<td>DMETest</td>
</tr>
<tr>
<td>RFC Destination</td>
<td>DMC_INT</td>
</tr>
</tbody>
</table>

4. Choose Save.

5. Choose the business system **DMESystem** you created and double-click Define Bus. System, BO in Dialog Structure on the side menu.

6. Choose New Entries and add the following BO types:

<table>
<thead>
<tr>
<th>Field</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BO Type</td>
<td>97</td>
<td>Production Order</td>
</tr>
<tr>
<td>BO Type</td>
<td>194</td>
<td>Material</td>
</tr>
<tr>
<td>BO Type</td>
<td>223</td>
<td>Production Bill of Operations</td>
</tr>
<tr>
<td>BO Type</td>
<td>493</td>
<td>Work Center</td>
</tr>
<tr>
<td>Field</td>
<td>Value</td>
<td>Description</td>
</tr>
<tr>
<td>-------------</td>
<td>-------</td>
<td>------------------</td>
</tr>
<tr>
<td>BO Type</td>
<td>467</td>
<td>Goods Movement</td>
</tr>
<tr>
<td>BO Type</td>
<td>183</td>
<td>Individual Material</td>
</tr>
</tbody>
</table>

7. Choose Save.

7. Define replication models and specify the outbound implementations for each model.
   1. Use transaction SPRO and choose SAP Reference IMG.
   3. Choose New Entries and complete the following fields:

<table>
<thead>
<tr>
<th>Field</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Replication Model</td>
<td>DMEModel</td>
</tr>
<tr>
<td>Description</td>
<td>DMEModel</td>
</tr>
<tr>
<td>Log Days</td>
<td>10</td>
</tr>
</tbody>
</table>

4. Choose Save.

5. Choose the replication model you created and double-click Assign Outbound Implementation in Dialog Structure on the side menu.

6. Choose New Entries and add the following outbound implementations:

<table>
<thead>
<tr>
<th>Field</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outbound Implementation</td>
<td>97_1</td>
<td>Production Order IDoc</td>
</tr>
<tr>
<td>Outbound Implementation</td>
<td>194_1</td>
<td>Material via IDoc (ME - enhanced Filter Object)</td>
</tr>
<tr>
<td>Outbound Implementation</td>
<td>223_1</td>
<td>Routing via IDoc (ME)</td>
</tr>
<tr>
<td>Outbound Implementation</td>
<td>467_1</td>
<td>Goods Movement via IDoc</td>
</tr>
<tr>
<td>Outbound Implementation</td>
<td>493_1</td>
<td>Workcenter via IDOC</td>
</tr>
<tr>
<td>Outbound Implementation</td>
<td>183_1</td>
<td>Equipment via IDoc (ME)</td>
</tr>
</tbody>
</table>

7. Choose Save.

8. Choose the outbound implementation 97_1 and double-click Assign Target Systems for Repl. Model / Outb.Impl in Dialog Structure on the side menu.

9. Choose New Entries to add the business system.

10. Repeat steps h and i and add the business system for other outbound implementations you created in the previous step.

11. Choose Save.
12. Double-click Define Replication Model in Dialog Structure on the side menu, choose the replication model and then choose Activate.

8. Define filter criteria.
   1. Use transaction DRFF to access the Define Filter Criteria screen through SAP NetWeaver.
   2. Select a replication model and choose Create to define filter criteria.

9. Maintain a logical system for the distribution of production orders.
   1. Use transaction SPRO and choose SAP Reference IMG.
   2. Choose Production Integration with a Manufacturing Execution System Integrate Production Order with a Manufacturing Execution System Maintain Logical System for Distribution of Production Orders.
   3. Choose New Entries to add a logical system.
   4. Choose Save.

### 3.2.1.4 Connect SAP Cloud Integration to SAP Digital Manufacturing Cloud

To enable communication from SAP Cloud Integration to SAP Digital Manufacturing Cloud, you need to configure the client credentials of SAP Digital Manufacturing Cloud in SAP Cloud Integration.

#### Procedure

1. [Create a service instance and a service key for SAP Digital Manufacturing Cloud.](#) [page 135]
2. Set up the security parameters CF_AUTH and PD_DEPLOYER_USER. CF_AUTH is required to authorize SAP Digital Manufacturing Cloud to send requests to SAP Cloud Integration and PD_DEPLOYER_USER is configured to write initial parameters to SAP Cloud Integration so that these parameters can be accessed by all iFlows.
   1. Log on to SAP Cloud Integration and choose Operations View.
   2. Choose the Security Material app.
   3. Choose Create, and select User Credentials.
   4. Complete the following fields:

<table>
<thead>
<tr>
<th>Field</th>
<th>CF_AUTH</th>
<th>PD_DEPLOYER_USER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>CF_AUTH</td>
<td>PD_DEPLOYER_USER</td>
</tr>
<tr>
<td>User</td>
<td>&lt;clientid of Service Key&gt;</td>
<td>P-User ID</td>
</tr>
</tbody>
</table>

To obtain a P-User ID, see Grant User Access to SAP Cloud Integration [page 27].
### Field | CF_AUTH | PD_DEPLOYER_USER
--- | --- | ---
**Password** | <clientsecret of Service Key> | P-User password

**Note**
To find `<clientid of Service Key>` and the `<clientsecret of Service Key>`, log on to SAP BTP Cockpit PaaS Tenant (of Execution in SAP Digital Manufacturing Cloud), enter a space and choose [Services ➔ Service Instances ➔ Service Key](#), and check the `uaa` tag.

3. Copy the integration iFlow package.
   1. Log on to SAP Cloud Integration and choose Discover in the side bar menu.
   3. Choose Copy.
   4. Choose the [Click to work with content packages](#) icon in the side bar menu. If you see the package in the list, it means you have successfully copied the package.

4. Deploy the integration iFlow package.
   1. Log on to SAP Cloud Integration and choose the [Click to work with content packages](#) icon in the side bar menu.
   2. Choose the [SAP S/4HANA Integration with SAP Digital Manufacturing Cloud](#) package.
   3. In the Artifacts tab, choose the Action icon of Initial Parameters, and then select Configure to set the following parameters:

<table>
<thead>
<tr>
<th>Parameter Name</th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMMON_DME_IDENTITY_ZONE_SUBDOMAIN</td>
<td>The subdomain that allows SAP Cloud Integration to access web services of SAP Digital Manufacturing Cloud.</td>
<td>Go to <a href="#">SAP BTP Cockpit (of SAP Digital Manufacturing Cloud for execution)</a> choose the Execution SaaS tenant, and you can find the Subdomain in the Subaccount Details section.</td>
</tr>
<tr>
<td>COMMON_DME_INT_URL</td>
<td>The URL of the back-end integration-ms application.</td>
<td>Go to <a href="#">SAP BTP Cockpit (of SAP Digital Manufacturing Cloud for execution)</a> ➔ Subaccounts ➔ Services ➔ Service Instances ➔ Service Key You can find the URL under the tag manufacturing-execution-integration.</td>
</tr>
</tbody>
</table>

   **Note**
   Remember to add the prefix `https://` for the URL.
### Parameter Name | Description | Value
--- | --- | ---
COMMON_DME_SB_URL | Service broker URL for token fetching. | Go to SAP BTP Cockpit (of SAP Digital Manufacturing Cloud for execution) > Subaccounts > Services > Service Instances > Service Key. You can find the URL by choosing the tag `url` under the tag `uaa`. |
ENABLE_PLANT_CONVERSION | Define if you want to enable plant conversion function to connect multiple ERP plants to SAP Digital Manufacturing Cloud. | Enter TRUE to enable this function. For more information, see Plant Conversion [page 129]. |
PID | - | DME_Generic_Processing_00 |
TENANT_CREDENTIALS | The user credential created in the Security Material app. | PD_DEPLOYER_USER |
TENANT_URL | SAP Cloud Integration management URL used for iFlow deployment. | Use the SAP Cloud Integration management URL in the email you received after successful SAP Cloud Integration tenant provisioning. |

<table>
<thead>
<tr>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>https://&lt;tenant&gt;-tmn.avt.eu1.hana.ondemand.com</td>
</tr>
</tbody>
</table>

For more information, see How to Get SAP Cloud Integration Management URL [page 30].

4. Choose **Save** and then choose **Deploy**.
5. Repeat the above steps to deploy the remaining artifacts in the package.
3.2.1.5 Connect SAP Digital Manufacturing Cloud to SAP
Cloud Integration

To enable communication from SAP Digital Manufacturing Cloud to SAP Cloud Integration, you need to
configure SAP Cloud Integration destinations in your Execution SaaS tenant.

Procedure

1. Create the SAP Cloud Integration destinations `CPI_DESTINATION_IFLMAP` and `CPI_DESTINATION_TMN`.
   `CPI_DESTINATION_IFLMAP` is configured so that SAP Digital Manufacturing Cloud can access the
   endpoints exposed by SAP Cloud Integration. SAP Digital Manufacturing Cloud uses
   `CPI_DESTINATION_TMN` to access information such as SAP Cloud Integration logs.

   1. Log on to SAP Digital Manufacturing Cloud (Execution SaaS tenant) in SAP BTP Cockpit and choose
      Connectivity Destinations in the side menu bar.

   2. Choose New Destination and enter the following fields to create two SAP Cloud Integration
      destinations.
<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>URL</th>
<th>Proxy Type</th>
<th>Authentication</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPI_DESTINATION</td>
<td>HTTP</td>
<td>Enter the SAP Cloud Integration runtime URL</td>
<td>Internet</td>
<td>BasicAuthentication</td>
</tr>
<tr>
<td>N_IFLMAP</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Example**

For SAP Cloud Integration in the Cloud Foundry environment, the URL is `https://<Cloud Integration tenant>.it-accd002-rt.cfapps.sap.hana.ondemand.com`.

For SAP Cloud Integration in Neo environment, the URL is `https://<Cloud Integration tenant>-iflmap.avtsbhf.eu1.hana.ondemand.com`.

For more information, see How to Get SAP Cloud Integration Runtime URL [page 32].
<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>URL</th>
<th>Proxy Type</th>
<th>Authentication</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPI_DESTINATION</td>
<td>HTTP</td>
<td>Enter the SAP Cloud Integration manage-</td>
<td>Internet</td>
<td>BasicAuthentication</td>
</tr>
<tr>
<td>N_TMN</td>
<td></td>
<td>ment URL</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Example**

For SAP Cloud Integration in Cloud Foundry environment, the URL is `https://<Cloud Integration tenant>.it-accd002.cfaapps.sap.hana.ondemand.com`. For SAP Cloud Integration in Neo environment, the URL is `https://<Cloud Integration tenant>-tnm.avt.eu1.hana.ondemand.com`.

For more information, see How to Get SAP Cloud Integration Management URL [page 30].

2. Create the destination `S4H_INTEGRATION_OAUTH` to provide authentication and authorization for SAP S/4HANA and SAP S/4HANA Cloud integration.
### 3.2.1.6 Install Cloud Connector

The Cloud Connector serves as a link between SAP BTP applications and on-premise systems.

For more information about how to install the Cloud Connector on your operating system, see Cloud Connector Installation.
### 3.2.1.7 Set Up Connection Between SAP Cloud Integration, Cloud Connector and SAP S/4HANA

Configure the Cloud Connector to make it operational for connections between your SAP BTP applications and on-premise systems.

#### Procedure

1. **Configure the Cloud Connector**
   1. **Initial configuration**
      After installing and starting the Cloud Connector, log on to the administration UI and perform the required configuration to make your Cloud Connector operational. For more information, see [Initial Configuration](#).
   2. **Add and connect your SAP Cloud Integration subaccount to the Cloud Connector.** For detailed procedures, see [Configure Subaccounts in Cloud Connector](#).
   3. **Add system mapping to SAP S/4HANA and configure access control.** For more information, see [Configure Access Control](#).

2. **Add RFC destinations of SAP S/4HANA in SAP Cloud Integration.**
   1. Log on to SAP Digital Manufacturing Cloud (SAP Cloud Integration tenant) in SAP BTP Cockpit, and choose **Connectivity > Destinations** in the side menu bar.
   2. Choose **New Destination**, and enter the following fields to create the destination.  
      - **Name**: RFC
      - **Type**: OnPremise
      - **User**: Enter the user name to access SAP S/4HANA
      - **Password**: Enter the password to access SAP S/4HANA
      - **Location ID**: If you have maintained a location ID in the Cloud Connector, enter the location ID here.

3. Add the following **Additional Properties**:

<table>
<thead>
<tr>
<th>Property</th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>jco.client.ashost</td>
<td>The Virtual Host of the SAP S/4HANA defined in the Cloud Connector.</td>
<td>Example: <code>&lt;virtual host&gt;</code></td>
</tr>
<tr>
<td>Property</td>
<td>Description</td>
<td>Value</td>
</tr>
<tr>
<td>--------------------------</td>
<td>------------------------------------</td>
<td>-----------</td>
</tr>
<tr>
<td>jco.client.client</td>
<td>The client number of SAP S/4HANA</td>
<td>100</td>
</tr>
<tr>
<td>jco.client.lang</td>
<td>The language of SAP S/4HANA</td>
<td>EN</td>
</tr>
<tr>
<td>jco.client.sysnr</td>
<td>The system number of SAP S/4HANA</td>
<td>22</td>
</tr>
<tr>
<td>jco.destination.pool_capacity</td>
<td>The connection number.</td>
<td>5</td>
</tr>
</tbody>
</table>

4. Check the availability of the destination connection.

### 3.2.1.8 Configure SAP Digital Manufacturing Cloud for Outbound Integration

You need to make configurations in SAP Digital Manufacturing Cloud to connect plants and enable integration with SAP S/4HANA.

**Procedure**

1. Define the SAP S/4HANA plant you want to integrate with.
   1. Log on to SAP Digital Manufacturing Cloud using the Fiori Launchpad and choose the Manage Plants app.
   2. In the initial screen, choose Create to add the plant defined in SAP S/4HANA that you want to integrate with SAP Digital Manufacturing Cloud.
   3. Complete the fields in the Create Plant screen. For more information about the fields, see Manage Plants.
2. Define the mapping of collaboration links with collaboration directives for outbound integration. For more information, see Manage Collaboration Links.
3.2.2 Integration Scenarios

The following scenarios are supported in the integration with SAP S/4HANA.

SAP ERP is the system of record for master data and SAP Digital Manufacturing Cloud for execution is the system of record for all work-in-process (WIP) data.

- **Integration of Master Data**
  You can transfer master data such as materials, BOMs, routings and work centers from SAP S/4HANA to SAP Digital Manufacturing Cloud.

- **Integration of Transaction Data**
  You can enable bidirectional transfer of transaction data such as orders, inventory, batch and quality inspection information.

- **Plant Conversion**
  If you have one plant maintained in multiple SAP ERP or SAP S/4HANA systems, you can use plant conversion to map the ERP plant to multiple plants in SAP Digital Manufacturing Cloud.

Related Information

Integration of Master Data [page 50]
Integration of Transaction Data [page 70]
Plant Conversion [page 129]

3.2.2.1 Integration of Master Data

**Use**

Master data is transferred from an SAP ERP or an SAP S/4HANA system to an SAP Digital Manufacturing Cloud for execution system.

SAP ERP gives manufacturing staff a clear overview of production operations and gives the management team greater analytical capability. SAP ERP is the system of record for master data and SAP Digital Manufacturing Cloud for execution is the system of record for all WIP data.

You can integrate the following master data with SAP ERP:

<table>
<thead>
<tr>
<th>Master Data Integration</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SAP ERP</strong></td>
</tr>
<tr>
<td>Material</td>
</tr>
<tr>
<td>BOM</td>
</tr>
<tr>
<td>Work Center</td>
</tr>
<tr>
<td>SAP ERP</td>
</tr>
<tr>
<td>---------</td>
</tr>
<tr>
<td>Routing</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

### Prerequisites

The material of the BOM as well as the materials of the components and the work center are in SAP Digital Manufacturing Cloud for execution.

### Sequence Considerations

- Materials must be transferred prior to BOMs.

### Implementation Considerations

Some functions may behave differently depending on the SAP ERP version used for integration with SAP Digital Manufacturing Cloud for execution.

### Related Information

- Manage Materials
- Manage BOMs
- Manage Work Centers
- Manage Routings
- Integration of Transaction Data [page 70]
- Field Mapping for Integration to SAP ERP or SAP S/4HANA [page 111]

### 3.2.2.1.1 Material Integration

You can transfer material master data from SAP ERP to create or update the corresponding material record in SAP Digital Manufacturing Cloud for execution.

Before production orders can be created in SAP Digital Manufacturing Cloud for execution, the material to manufacture must first exist in SAP ERP. The material integration process ensures that a material created in SAP ERP and transferred to SAP Digital Manufacturing Cloud for execution can be created and released.
In some cases, specific material properties may be required to manufacture the material. This information is stored as classification data in SAP ERP and associated to the material master record. This classification data must be maintained in SAP ERP and associated with the material. Then the material and associated class data can be transferred to SAP Digital Manufacturing Cloud for execution as part of the material transfer.

Transferring the material from SAP ERP to SAP Digital Manufacturing Cloud for execution ensures consistent data so that inventory and WIP numbers are accurate between SAP ERP and SAP Digital Manufacturing Cloud for execution during production.

Integration information and constraints include the following:

- The material master is used by all components in the SAP ERP Logistics system.
- To facilitate integration, the data contained in the material master is required for the following functions in SAP ERP:
  - In *Inventory Management*, for goods movement postings and physical inventory
  - In *Production Planning and Control*, for material requirements planning and scheduling
- The SAP ERP base unit of measure for material is used by SAP Digital Manufacturing Cloud for execution material, inventory ID, bill of materials (BOM), and production order records and then reported back to SAP ERP in confirmations.
- The SAP ERP discontinuation concept is not supported.
- The language of the material description value matches the SAP ERP plant language. If the description in the SAP ERP plant language is not available, SAP Digital Manufacturing Cloud for execution uses the value in the first available language.

Related Information

Manage Materials

3.2.2.1.1.1 Configuring a Material Master

You can create and transfer material master data from SAP ERP to create or update the corresponding material record in SAP Digital Manufacturing Cloud for execution.


Prerequisites

**SAP ERP**

- You have set up ALE communication to create and transmit a MATMAS03 IDoc.
- You have defined the DRF Replication Model to replicate MATMAS03 IDocs. For information about the SAP ERP versions supporting DRF, see SAP Note 1793291.
Procedure

1. Create a material master record in SAP ERP (see Creating a Material Master Record on the SAP Help Portal at http://help.sap.com).
2. Send the material master record to SAP Digital Manufacturing Cloud for execution. We recommend using the Execute Data Replication transaction (transaction code – DRFOUT). Make sure that you have created and activated a replication model with the outbound implementation for the material (194_1). For more information about setting up data replication, see the Data Replication Setup section of this guide.

   Note
   You can send a material using the Send Material (BD10) transaction.

3. Verify results in SAP Digital Manufacturing Cloud for execution.

Related Information

Manage Materials
Monitor Integration Messages

3.2.2.1.1.2 Configuring a Batch-Managed Material with Batch Characteristics

You can transfer a batch-managed material master record together with batch characteristics assigned to it from SAP ERP to create or update the corresponding material record in SAP Digital Manufacturing Cloud for execution.

What is batch management? In production, you cannot guarantee that material features are exactly alike. For example, you cannot guarantee that a certain color will always have the same shade. You cannot avoid minor differences between production lots. To manage these differences, you must uniquely identify the individual production lots of the same material and manage them separately in inventory.

A batch is a quantity of the material produced during a given production run. A batch represents a homogeneous unit with unique specifications. A batch is a subset of the total quantity of a material held in stock. The subset is managed from all other subsets of the same material.

Materials that require precise identification, for example, pharmaceutical products are identified and managed in stock according to both, the material number and the batch number.
Prerequisites

SAP ERP

- You have set up ALE communication to create and transmit a MATMAS03 IDoc.
- You have defined the DRF Replication Model to replicate MATMAS03 IDocs (in Customizing for Production, choose Integration with a Manufacturing Execution System ➔ Basic Settings for MES Integration ➔). For information about the SAP ERP versions supporting DRF, see SAP Note 1793291 ➔.
- You have configured Batch Management.
- You have assigned batch characteristics to the material.

Procedure

2. Send the material master record to SAP Digital Manufacturing Cloud for execution. We recommend using the Execute Data Replication transaction (transaction code – DRFOUT). Make sure that you have created and activated a replication model with the outbound implementation for the material (194_1). For more information about setting up data replication, see the Data Replication Setup section of this guide.

   i Note
   You can send a material using the Send Material (BD10) transaction.

3. Verify the results in SAP Digital Manufacturing Cloud for execution.

Related Information

Manage Materials

3.2.2.1.1.3 Configuring a Long Material Number

You can use a long material number record from SAP ERP to create or update the corresponding material record in SAP Digital Manufacturing Cloud for execution.

The standard SAP ERP material number field uses the domain MATNR, which has an input, output, and database length of 18 characters.

The long material number (MATNR_EXTERNAL) is the normal 18-character material number plus 22 additional characters, allowing you to use 40-character material numbers.

Prerequisites

SAP ERP

- You have set up ALE communication to create and transmit a MATMAS03 IDoc.
- You have defined the DRF Replication Model to replicate MATMAS03 IDocs (in Customizing for Production, choose Integration with a Manufacturing Execution System > Basic Settings for MES Integration). For information about the SAP ERP versions supporting DRF, see SAP Note 1793291.
- You have activated the following business functions:
  - DIMP_SDUD: Discrete Industries — Mill Products
  - MGV_LAMA: Long Material Number
- You have run the ENLM (Enable Long Material Number) report.
- You have implemented SAP Notes 1795373 and 1871674 or applied the corresponding support packages.

Procedure

1. Create a material master record in SAP ERP with a name that contains more than 18 characters (see Creating a Material Master Record on the SAP Help Portal at http://help.sap.com).
2. Send the material master record to SAP Digital Manufacturing Cloud for execution.
   - We recommend that you use the Execute Data Replication transaction (transaction code – DRFOUT).
   - Ensure that you have created and activated a replication model with the outbound implementation for the material (194_1). For more information about setting up data replication, see the Data Replication Setup section of this guide.
   - **Note**: You can send a material using the Send Material (BD10) transaction.
3. Verify the results in SAP Digital Manufacturing Cloud for execution.

Related Information

Manage Materials
3.2.2.1.4 Configuring a Backflushed Material

You can transfer a backflushed material from SAP ERP to create or update the corresponding material record in SAP Digital Manufacturing Cloud for execution.

What is backflushing? A goods issue has to be posted for every material that is withdrawn during order processing. By backflushing, goods issue posting is carried out at a later date, that is, when the phase for the relevant material component is confirmed.

Prerequisites

SAP ERP
- You have set up ALE communication to create and transmit a MATMAS03 IDoc.
- You have defined the DRF Replication Model to replicate MATMAS03 IDocs (in Customizing for Production, choose Integration with a Manufacturing Execution System > Basic Settings for MES Integration). For information about the SAP ERP versions supporting DRF, see SAP Note 1793291.

Procedural Steps

1. Create a backflushed material record in SAP ERP (for more information, refer to the SAP Help Portal at http://help.sap.com).
2. Send the material master record to SAP Digital Manufacturing Cloud for execution. We recommend that you use the Execute Data Replication transaction (transaction code – DRFOUT). Ensure that you have created and activated a replication model with the outbound implementation for the material (194_1). For more information about setting up data replication, see the Data Replication Setup section of this guide.

   i Note
   You can send a material using the Send Material (BD10) transaction.

3. Verify the results in SAP Digital Manufacturing Cloud for execution.

3.2.2.1.2 Bill of Material Integration

You can transfer BOM master data from SAP ERP to create or update the corresponding BOM Master type record in SAP Digital Manufacturing Cloud for execution.

Purpose

The basic Bill of Material (BOM) in SAP ERP contains a list of all the components belonging to the assembly. This structured list of components can be transferred to SAP Digital Manufacturing Cloud for execution to ensure that all the components are tracked during the manufacturing process. To avoid mistakes such as duplicate entries of BOM data, use the BOM transfer functionality between SAP ERP and SAP Digital Manufacturing Cloud for execution.
Each BOM is transferred as a single level BOM, so subassembly BOMs need to be transferred separately. The structure of the BOM in SAP ERP may not match the structure of the BOM that manufacturing would prefer. Review the structure of the BOM in SAP ERP to see if you need to make any adjustments to the BOM structure.

### 3.2.2.1.2.1 Configuring a Bill of Material (BOM)

You can transfer BOM master data from SAP ERP to create or update the corresponding BOM Master type record in SAP Digital Manufacturing Cloud for execution.

For more information about data transferred using IDocs and the fields in SAP ERP that map to fields in SAP Digital Manufacturing Cloud for execution, see the Field Mapping for the Integration with SAP ERP or S/4HANA On-Premise section of this guide.

#### Prerequisites

**SAP ERP**

- You have set up ALE communication to create and transmit BOMMAT IDocs.
- You have transferred materials to SAP Digital Manufacturing Cloud for execution (see Material Transfer on the SAP Help Portal at [http://help.sap.com](http://help.sap.com)).

#### Procedural Steps

2. Send the BOM master record to SAP Digital Manufacturing Cloud for execution. We recommend that you use the Material BOM Distribution transaction (transaction code – BD30).

   **Note**

   The Bill of Material (BOM) can also be transferred to SAP Digital Manufacturing Cloud for execution with the BOMMAT IDoc.

3. Verify the results in SAP Digital Manufacturing Cloud for execution. The corresponding BOM record is created or updated in SAP Digital Manufacturing Cloud for execution (see Manage BOMs).
3.2.2.1.2.2 Configuring a Bill of Material with Assembly Operations

You can transfer BOM master data with assigned assembly operations from SAP ERP to create or update the corresponding BOM Master type record in SAP Digital Manufacturing Cloud for execution.

The production processes for a product are described without reference to an order in routings. A routing is a description of which operations (process steps) have to be carried out, and in which order, to produce a material (product). The production processes describe the production resources or tools, material components, and test equipment required.

When describing the production resources/tools used to produce a material, the work scheduler is supported by the assignment of BOM items to operations.

This assignment means that the BOM items or materials are not reserved until the start point of the operation. If you do not assign items to specific operations, the system automatically assigns all material components in a BOM to the first operation when the order is opened. This means that they are all made available at the start point of the first operation.

Prerequisites

**SAP ERP**

- You have created materials and routings in SAP ERP.
- You have transferred materials to SAP Digital Manufacturing Cloud for execution (see Material Transfer on the SAP Help Portal at http://help.sap.com).
- You have also defined the Data Replication Framework (DRF) replication model to replicate LOI PRO IDocs (in Customizing for Production, choose Integration with a Manufacturing Execution System Basic Settings for MES Integration). For information about the SAP ERP versions supporting DRF, see SAP Note 1793291.

Procedural Steps

- 1. Create a bill of material with allocated components in SAP ERP.
- 2. Send a BOM master record to SAP Digital Manufacturing Cloud for execution within a production order.
- 3. Verify the results in SAP Digital Manufacturing Cloud for execution. The corresponding BOM record is created or updated in SAP Digital Manufacturing Cloud for execution (see Manage BOMs).
3.2.2.1.2.3 Configuring a Shop Order-Specific Bill of Material

You can transfer BOM master data within a production order for make-to-order production. In this case, SAP Digital Manufacturing Cloud for execution creates an order-specific BOM for use with this production order.

Procedural Steps

1. Create a finished material and transfer it to SAP Digital Manufacturing Cloud for execution.
2. Define a routing record in SAP ERP. You do not need to transfer it to SAP Digital Manufacturing Cloud for execution.
3. Define a BOM record in SAP ERP. You do not need to transfer it to SAP Digital Manufacturing Cloud for execution.
4. Transfer work center records that were used when creating the routing from SAP ERP to SAP Digital Manufacturing Cloud for execution.
5. Create and release a production order containing BOM and routing master data in SAP ERP.
6. In the Manage BOMs app, verify the results in SAP Digital Manufacturing Cloud for execution.

Note

The Valid From value for the BOM is not transferred within a production order. It is available in the BOMMAT IDoc only.

7. (optional) You can use the Monitor Integration Messages app to verify that IDocs were received in SAP Digital Manufacturing Cloud.

For more information about make-to-order processing, see Make-to-Order Processing in ERP on the SAP Help Portal at http://help.sap.com.

Related Information

Manage BOMs
Monitor Integration Messages

3.2.2.1.3 Production Version

You can replicate the production versions from SAP S/4HANA to SAP Digital Manufacturing Cloud for execution using SOAP.

Procedure

1. Set up service group in t-code: SOAMANAGER
1. Download the WSDL file of service consumer ManufacturingProdnVersInfo_Out via t-code SE80. Go to the repository browser, then PP_SOA_SERVICES Subpackages Enterprise Services Service Consumers CLASCO_PRINT_MFG_PRODN_VERS. You can also download the WDSL file here: Production Version. Choose Download API Specification and choose WSDL. You will need to login to get the file. The binding should contain the following format:

```xml
<wsdl:binding type="tns:ManufacturingProdnVersInfo_Out" name="CO_PPINT_MFG_PRODN_VERS">
  <soap:binding transport="http://schemas.xmlsoap.org/soap/http" style="document"/>
  <wsdl:operation name="ManufacturingProdnVersInfo_Out">
    <wsdl:input>
      <soap:body use="literal"/>
    </wsdl:input>
  </wsdl:operation>
</wsdl:binding>
<wsdl:service name="CO_PPINT_MFG_PRODN_VERS_service">
  <wsdloam!:port name="CO_PPINT_MFG_PRODN_VERS_port_soap11" binding="tns:CO_PPINT_MFG_PRODN_VERS">
    <soap:address location="https://[URL for manufacturing-execution-integration]/ws?
    X-Identity-Zone-Subdomain=[subdomain from the SAAS tenant]"/>
  </wsdl:port>
</wsdl:service>
```

2. Add the binding element and the service element in the WSDL file. Fill the address of the soap:address location using the DMC URL. To get the URL, go to the SAAS tenant of SAP Cloud Platform Instances and Services find the needed instance and choose the Keys button under the Credentials column. Choose the URL for manufacturing-execution-integration.

**i Note**

Enter the URL for the soap:address using the following format: https://[URL for manufacturing-execution-integration]/ws?X-Identity-Zone-Subdomain=[subdomain from the SAAS tenant]

3. Upload the WSDL file in SOA Management (t-code SOAMANAGER). In SOA Management, navigate to Tools WSDL Upload. Choose Create and select Via File for the WSDL Base on the Upload WSDL screen.

4. Publication of the external WSDL. Path: SOA Management Service Registry Publication of external WSDL. In the search, select the Production Version WSDL for DMC Integration (PRODV_DMC_V0559).

5. In the Service Details tab, enter the Port Type Name and the Namespace. Make sure that the port type name and namespace are identical to the service definition in t-code SPROXY. To find the t-code SPROXY, go to the repository browser and search for PP_SOA_SERVICES Subpackages Enterprise Services Service Consumers CLASCO_PRINT_MFG_PRODN_VERS. The information is in the Service Consumer section.

**Example**

- **Name**: ManufacturingProdnVersInfo_Out
- **Namespace**: http://sap.com/xl/PP/Global2
6. In the Service State tab, select Configured. In the Bindings select the binding that will be published. In the Physical System tab, if the physical system is already defined, choose the existing one. Otherwise, select New and enter the system name and enter any name for the host name. Select Third Party for the system type.

7. To define a profile, go to SOA Management ➤ Technical Administration ➤ Profiles. If the profile is already defined, you can skip this step. To define a profile, in the General tab, enter the profile name, description, and select Old Profile Mode. In the Authentication section of the Security tab, select User ID/Password for the authentication method. For Transport Security, select Secured Communication. In the Identifiable Business section of the Security tab, select No IBC Determination for the IBC Determination Type.

8. To define the provider system, go to SOA Management ➤ Technical Administration ➤ Provider Systems. In the General tab, enter the provider system name and the profile name. Use the profile name that you created before. If the provider system is already defined, you can skip this step. Note that the provider system name will be used in the Data Replication Framework as the business system.

9. In the Services Search Settings tab, select Use Services Registry. Select the correct value for the Services Registry field.

Example

SR_LOCAL.

In the SLD Identifier, select the correct SLD identifier from the table. In the WSIL Service section, select Use WSIL. In the WSDL Documents section, enter the User for WSDL Access and the Password for WSDL from the service registry (using the credentials for the SAP S/4HANA user). Select Tolerant Search for the search granularity. Select Retrieved Business Application ID from Services Registry.

10. In the Applications tab, choose Retrieve Business Applications and confirm activation by selecting Yes.

11. To define logon data to access SAP Digital Manufacturing Cloud for execution, go to SOA Management ➤ Service Administration ➤ Logon Data Management. If the logon data is already defined, you can skip this step.

Note

To get the URL and basic authentication information for SAP Digital Manufacturing Cloud for execution go to the SAAS tenant of the SAP Cloud Platform, select the needed service instance, and open the credentials by choosing the Keys button:

- `manufacturing-execution-integration` is the URL for DMC
- `clientid` is the username
- `clientsecret` is the password

12. To create a local integration scenario, go to SOA Management ➤ Service Administration ➤ Local Integration Scenario Configuration. In this step, you can create a new scenario or add a new service group and binding assignment to an existing scenario. In the General tab, enter the name of the business scenario and the description. Choose Next. In the Scenario Definitions tab, don’t make any changes. In the Service Groups tab, choose Add to open the Add consumer value help and add the consumer uploaded from the external file. In the Search criteria, enter the following search criteria: Object Name - contains - *PROD*. In the Maximum Number of Results, enter 100. Choose Search. In the Search Results section, select the correct consumer.
13. Choose **Assign IBC Reference** to assign a provider IBC reference. In the Search criteria, enter the following search criteria:
   - System - contains - *DMC*
   - Type - is - Client
   All the other criteria can be undefined. Choose Search. In the Search Results, select the provider IBC reference and choose Assign to Service Group.

14. In the Logon Data Assignment tab, provide Logon Data.

15. To execute the pending tasks, go to SOA Management ➔ Service Administration ➔ Pending Tasks. In the Pending Tasks, switch to Expert Mode and filter by business scenario to find your tasks. Choose Rebuild List to filter the tasks. Choose Process List in the Pending Tasks window to create a central logical post for the service group. Choose Expand to see if you have successfully created a central logical post for the inbound interface.

16. To verify the configuration, go to SOA Management ➔ Service Administration ➔ Web Service Configuration. In the Web Service Configuration window, choose the Design Time Object Search tab and enter the following search criteria:
   - Object Type - is - Consumer Proxy
   - Object Name contains *PRODN*
   You should get the consumer proxy after the search.

17. In the Transport Settings, choose Complete URL for the URL Access Path. In the *URL field, enter the DMC URL. To get the URL and basic authentication information for SAP Digital Manufacturing Cloud for execution go to the SAAS tenant of the SAP Cloud Platform, select the needed service instance, and open the credentials by choosing the Keys button.

   The manufacturing-execution-integration is the URL for DMC. Please use the following format: https://[URL for manufacturing-execution-integration]/ws?X-Identity-Zone-Subdomain=[subdomain from the SAAS tenant]

   The Logon Language setting, must have the Language of User Context value. The Transport Binding section should have the following setting values:

   **Transport Binding Settings**

<table>
<thead>
<tr>
<th>Setting</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Make Local Call</td>
<td>No Call in Local System</td>
</tr>
<tr>
<td>*Transport Binding Type</td>
<td>SOAP 1.1</td>
</tr>
</tbody>
</table>
2. Set up the Data Replication Framework for production version replication via t-code DRFIMG.

1. Define the business system. The name of the business system should follow the name of provider system defined in SOAMANAGER.
2. Assign the business system to a combination of a replication model and the outbound implementation FIN0002_PV. You can reuse a previously created replication model for DMC scenarios or you can create a new one.

For more information on configuring a service group in SOAMANAGER, see Configuring a Service Group.

For information on SAP S/4HANA, see https://wiki.scn.sap.com/wiki/display/ABAPConn/ABAP+Connectivity+++-+Web+Services+ABAP

### 3.2.2.1.4 Work Center Integration

You can transfer work center master data that is created or updated in SAP S/4HANA to SAP Digital Manufacturing Cloud for execution.

A work center is an area at a site at which inventory is manufactured or processed. Work centers are used to divide the portions of a routing along functional work lines.

A work center in SAP S/4HANA can represent either a work center or a resource in SAP Digital Manufacturing Cloud for execution, depending on how the work center is configured. Configuring the work center in SAP S/4HANA allows for capacity planning to take place. To keep the number of resources and work centers in SAP Digital Manufacturing Cloud for execution consistent with the capacity that is defined as available in SAP S/4HANA, you can transfer the defined production work centers.

Integration information and conditions include:

- Operations are carried out at a work center in SAP S/4HANA.
- The data stored in the work center is used in SAP S/4HANA for the following:
  - **Routings**
    Work centers are assigned to operations in task lists. If default values are changed in a work center, the changes are effective in the task list in case a reference indicator has been set for the default value.
  - **Work center hierarchies**
    Work centers can be arranged in hierarchies. Hierarchies are used in capacity planning to cumulate available capacities and capacity requirements in a hierarchy work center.
Related Information

Manage Work Centers

3.2.2.1.4.1 Transfer of Work Centers from SAP S/4HANA

You can transfer work center master data that is created or updated in SAP S/4HANA to SAP Digital Manufacturing Cloud for execution.

Once the customer has established a list of equipment on the manufacturing floor and divided it up into logical work centers, these objects need to be entered into SAP S/4HANA as work centers. The created work centers will form the structure of available resources for capacity planning to take place. Make sure that the work centers created in the system, model the equipment that is available on the manufacturing floor.

**i Note**

Shifts and shift assignments are transferred along with work center capacities from SAP S/4HANA to SAP Digital Manufacturing Cloud.

Prerequisites

**SAP S/4HANA**

- You have defined individual capacities using work center capacity assignments.
- You have set up ALE communication to create and transmit LOIWCS IDocs.
- You have defined the DRF Replication Model to replicate LOIWCS03 IDocs.
- Ensure that a user used for Master Data Transfer (POIM) has the SAP_BR_PRODN_ENG_DISC role. We recommend that you use the Master Data Transfer (POIM) or Execute Data Replication transaction (transaction code – DRFOUT).
- You can transfer work centers along with standard value keys (see SAP Note 2996757).

Procedural Steps

1. Log on to the SAP S/4HANA system.
2. Open the Master Data Transfer (POIM) transaction.
3. Specify Optimization System (logical system / target system).
4. Select a work center / plant for transfer.
5. Choose Execute.
6. Verify results in SAP Digital Manufacturing Cloud for execution. You can view the transferred work centers in the Manage Work Centers app. Work center capacity updates in SAP S/4HANA result in the corresponding changes in SAP Digital Manufacturing Cloud. In addition, you can view the capacity category...
in the Manage Work Centers app. Note that ERP Work Center is set to Yes for the work centers transferred from SAP S/4HANA.

You can view the transferred shifts assigned to work center capacities in the Manage Resources app.

Related Information

Manage Work Centers
Manage Resources

3.2.2.1.5 Transfer of QM Defect Code Groups and Codes from SAP S/4HANA

You can transfer Quality Management (QM) defect code groups and codes from SAP S/4HANA to SAP Digital Manufacturing Cloud using the Manage Nonconformance Groups app.

Prerequisites

You have set up integration with SAP S/4HANA (see Connecting to SAP S/4HANA [page 25])

Procedural Steps

1. In the Manage Nonconformance Groups app, choose Sync QM Groups.
2. Search for the production-relevant QM defect code groups that exist in the connected SAP S/4HANA system. The selection is restricted to catalog type 9 (Defect types) in SAP S/4HANA. Only released code groups are displayed and can be transferred.
   You can check which QM code groups have been previously transferred by selecting Yes in the Previously Synched dropdown. If you need to transfer new QM code groups, select Yes in the Previously Synched dropdown.
3. Select one or more QM code groups and choose Sync.

The selected QM code groups are transferred to SAP Digital Manufacturing Cloud. QM defect groups and codes transferred from SAP S/4HANA are marked with ERP Group and ERP Code indicators set to Yes in the Manage Nonconformance Groups and Manage Nonconformance Codes apps. Note that a nonconformance code originated from SAP S/4HANA is represented by the concatenated name (QM defect code and code group).

Related Information

Manage Nonconformance Groups
3.2.2.1.6 Routing Integration

This section describes how to transfer routing data from SAP ERP to create or update corresponding routing and operation records in SAP Digital Manufacturing Cloud for execution.

In SAP ERP, the routing for the material determines the key pieces of inventory-related information such as the consumption points in the manufacturing process for certain components, and the final confirmation step when the manufactured material can be put into the finished goods inventory.

• The routing is a description of which operations (process steps) have to be carried out and in which order to produce a material (product). Therefore, routings are used as a template for production orders and planned orders (repetitive manufacturing) as well as a basis for product costing.

• The data stored in the routing serves as a basis for production planning activities in SAP ERP such as the following:
  ● In Materials Management, to plan the usage of materials and external operations
  ● In Production Planning and Control, to plan the usage of work centers
  ● In Quality Management, to plan quality inspections for production activities

The system creates two SAP Digital Manufacturing Cloud for execution objects:

• Operation
  The description of the SAP Digital Manufacturing Cloud for execution operation is populated with the SAP ERP operation short text.

  i Note
  Operation activity master records can be created based on the SAP ME Operation and Version fields on the Operation record in the routing configuration.

• Routing
  ○ SAP Digital Manufacturing Cloud for execution defaults the first routing to version A and increments an additional integer value for subsequent updates. For example: A-01, A-02.
    A new routing version is created when you add new operations or change the following in SAP ERP:
      ○ Operation number
      ○ Operation control key
      ○ Operation short text

Related Information

Manage Routings
3.2.2.1.6.1 Configuring a Standard Routing in SAP ERP

This section describes how to transfer routing data from SAP ERP to create or update corresponding routing and operation records in SAP Digital Manufacturing Cloud for execution.

Prerequisites

SAP ERP

- You have created work centers with plant and production-relevant data in the Logistics module (see Creating, Changing and Displaying Work Centers on the SAP Help Portal at help.sap.com). You have transferred work centers to SAP Digital Manufacturing Cloud for execution.

  i Note
  Creating and setting up a work center is a required step for routing configuration.

- You have created a BOM and a routing for the produced material (see Manage BOMs and Manage Routings).
- You have transferred materials to SAP Digital Manufacturing Cloud for execution.
- You have set up ALE communication to create and transmit LOIROU IDocs.
- You have also defined the Data Replication Framework (DRF) replication model to replicate LOIROU IDocs (in Customizing for Production, choose Integration with a Manufacturing Execution System > Basic Settings for MES Integration). For information about the SAP ERP versions supporting DRF, see SAP Note 1793291.

Procedural Steps

1. Create a routing master record in SAP ERP (see Creating a Routing on the SAP Help Portal at help.sap.com).
2. Send the routing master record to SAP Digital Manufacturing Cloud for execution.
   We recommend using the Execute Data Replication transaction (transaction code – DRFOUT).
   Make sure that you have created and activated a replication model with the outbound implementation for the routing (223_1).
3. Verify the results in SAP Digital Manufacturing Cloud for execution.

Related Information

Manage Routings
3.2.2.1.7 Recipe Integration

You can transfer the recipe data from SAP ERP systems to SAP Digital Manufacturing Cloud for execution.

Prerequisites

SAP ERP

- You have created work centers with plant and production-relevant data in the Logistics module (see Creating, Changing and Displaying Work Centers on the SAP Help Portal at http://help.sap.com). You have transferred work centers to SAP Digital Manufacturing Cloud for execution.
- You have created a BOM and a recipe for the produced material (see Manage BOMs and Manage Recipes).
- You have transferred materials to SAP Digital Manufacturing Cloud for execution.
- You have set up ALE communication to create and transmit an LOIROU04 IDoc.
- You have created and activated a replication model with outbound implementation for the recipe (223_1).
  For more information, see Set Up Data Replication Framework (DRF) [page 36].

Procedure

- Create a recipe master record in SAP ERP.
- Send the recipe master record to SAP Digital Manufacturing Cloud for execution
  We recommend using the Execute Data Replication transaction (transaction code – DRFOUT).
- Verify results in the Manage Recipes and the Monitor Integration Messages apps in SAP Digital Manufacturing Cloud for execution.

Related Information

Manage Recipes

3.2.2.1.8 Tool Integration

You can transfer PRTs from SAP ERP to create the corresponding tool record in SAP Digital Manufacturing Cloud for execution.

Unlike machines and fixed assets, production resources and tools (PRTs) are movable (not stationary) operating resources that are required to perform an activity and can be used repeatedly. There are several categories of PRTs in SAP ERP system. The category determines the characteristics and business functions that a PRT can have.
The PRTs can be assigned to operations / activities. You can use the assignment to track PRT usage during the production.

Before the tools can be scheduled and logged in SAP Digital Manufacturing Cloud for execution, the corresponding PRTs must first exist in SAP ERP and they need to be assigned to operations.

### Integration Overview

The following table describes the supported PRT types and how tools are created for each type.

<table>
<thead>
<tr>
<th>PRT Type</th>
<th>Tool</th>
<th>Integration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equipment PRT</td>
<td>The system automatically creates corresponding equipment tools in the Manage Tools app when equipment PRTs are downloaded from SAP ERP.</td>
<td>Equipment PRTs are transferred from ERP to SAP Digital Manufacturing Cloud through the EQUIPMENT_CREATE02 IDoc. For more details, see Transferring a Tool [page 69].</td>
</tr>
<tr>
<td>Material PRT</td>
<td>Unlike the equipment PRT, the system does not create tools when material PRTs are downloaded from ERP. You need to manually create respective tools in the Manage Tools app.</td>
<td>Material PRTs are transferred from ERP to SAP Digital Manufacturing Cloud together with the respective material master data.</td>
</tr>
</tbody>
</table>

#### 3.2.2.1.8.1 Transferring a Tool

This section describes how to transfer equipment PRTs from SAP ERP to SAP Digital Manufacturing Cloud for execution to create corresponding tools in SAP Digital Manufacturing Cloud for execution.

### Prerequisites

**SAP ERP**

- You have set up ALE communication to create and transmit an EQUIPMENT_CREATE02 IDoc.
- You have created and activated a replication model with outbound implementation for the equipment (183_1). For more information, see Set Up Data Replication Framework (DRF) [page 36].

**SAP Digital Manufacturing Cloud**

The referenced material (if there are any) of the equipment PRT has already been transferred from SAP ERP to SAP Digital Manufacturing Cloud.
Procedure

1. Create an equipment PRT in SAP ERP.
2. Send the equipment PRT to SAP Digital Manufacturing Cloud for execution.
   We recommend using the Execute Data Replication transaction (transaction code – DRFOU).
3. Verify results in the Manage Tools or the Monitor Integration Messages app in SAP Digital Manufacturing Cloud for execution.

3.2.2.2 Integration of Transaction Data

Use

To integrate transaction data, transaction data is transferred from an SAP ERP or S/4HANA system to the SAP Digital Manufacturing Cloud for execution system and then back to SAP ERP.

You can integrate the following transaction data with SAP ERP:

<table>
<thead>
<tr>
<th>Transaction Data Integration</th>
<th>SAP Digital Manufacturing Cloud for Execution</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAP ERP</td>
<td></td>
</tr>
<tr>
<td>Production order</td>
<td>Production order with routing</td>
</tr>
<tr>
<td>Production order with BOM</td>
<td>Production order with BOM and routing</td>
</tr>
<tr>
<td>Production order with a storage location assignment</td>
<td>Production order with storage location assignment</td>
</tr>
<tr>
<td>Production order with routing</td>
<td>Production order with routing</td>
</tr>
<tr>
<td>Routing with document info record (only for order specific routing)</td>
<td>Order specific routing with work instruction</td>
</tr>
<tr>
<td>Production order with serial numbers</td>
<td>Production order with serial numbers and planned SFC numbers</td>
</tr>
<tr>
<td>Production order with document info record</td>
<td>Production order with work instruction</td>
</tr>
</tbody>
</table>

i Note
There is no UI for storage location on the order or manage-storage location used goods receipt

The work instruction will be created with the order and attached at the order level. It will be displayed in the work center POD plugin work instruction for the specific order.
Production order with batch number

Production order with schedule information

Production order with operation-level schedule information

Production order with work center assignment on routing step and operation

Confirmation

Consumption

Scrap

You can integrate the following transaction data:

- Production order
- Production order confirmation
- Production order yield confirmation
- Component scrap confirmation for production order

### 3.2.2.2.1 Production Order Integration

This section describes how to transfer production order data from SAP ERP to SAP Digital Manufacturing Cloud for execution to create or update the corresponding production order record in SAP Digital Manufacturing Cloud for execution.

This function supports long material numbers.

Order integration between SAP ERP and SAP Digital Manufacturing Cloud for execution provides the control point from production planning to the order. The transfer of the order and integration of the order confirmations are critical to maintaining order level data synchronization between the two systems.

The production order, typically converted from a planned order output of an MRP run in SAP ERP and used to launch discrete production, is transferred to the SAP Digital Manufacturing Cloud for execution system for release as a production order.

The order in SAP Digital Manufacturing Cloud for execution communicates to SAP ERP the confirmation of yield and scrap as production is done on the shop floor. If components have been assembled, they are included in the confirmation so that they can be issued to the order in SAP ERP.


3.2.2.2.1.1 Transferring a Production Order

This section describes how to transfer production order data from SAP ERP or SAP S/4HANA to SAP Digital Manufacturing Cloud for execution to create or update the corresponding production order record in SAP Digital Manufacturing Cloud for execution.

Prerequisites

**SAP ERP or SAP S/4HANA**

- You have transferred the material master records for the produced material and all the components.
- You have created a BOM and a routing for the produced material (see Manage BOMs and Manage Routings)
- You have created and sent work centers to SAP Digital Manufacturing Cloud for execution.
- You have set up ALE communication to create and transmit LOI PRO IDocs.
- You have also defined the Data Replication Framework (DRF) replication model to replicate LOI PRO IDocs (in Customizing for Production, choose Integration with a Manufacturing Execution System » Basic Settings for MES Integration). For information about the SAP ERP versions supporting DRF, see SAP Note 1793291.
- You have defined unique ISO codes for every unit of measure.

**SAP Digital Manufacturing Cloud**

- (Optional) You have imported BOM and routing master data from SAP ERP, BOM and routing masters that are sent from SAP ERP to SAP Digital Manufacturing Cloud for execution prior to the production order download allow additional manual configurations to happen inside of SAP Digital Manufacturing Cloud for execution. This prerequisite is optional because you can create the BOM and routing master in SAP Digital Manufacturing Cloud for execution directly from the production order download.

Procedural Steps

1. Create or update a production order manually (transaction CO01 and CO02) or automatically by converting a planned order (see Creating a Production Order on the SAP Help Portal at http://help.sap.com).
2. SAP ERP 6.05 and later with the activated business function (BF) LOG_PP_MES_INT_02 distributes production orders automatically upon release based on the Data Replication Framework (DRF) filter settings (see DRF Integration for MES Processes on the SAP Help Portal at http://help.sap.com). Changes to the order are distributed immediately after the initial distribution.

3. Verify the results in SAP Digital Manufacturing Cloud for execution.

The system creates or updates the production order based on the data received from Tools with Engineering status can’t be used in Production/POD.

<table>
<thead>
<tr>
<th>i Note</th>
</tr>
</thead>
</table>

For production order updates from SAP ERP to SAP Digital Manufacturing Cloud, only build quantity increase and batch number updates are supported for now.

When the order is released in SAP Digital Manufacturing Cloud for execution, shop floor operators can see the operation start and end time in the POD worklist.

### 3.2.2.2.1.2 Configuring a Production Order with a BOM and Routing (Make-to-Stock or Make to Order Manufacturing)

This section describes how to transfer a production order with BOM and routing from SAP ERP to create or update the corresponding BOM with defined assembly operations that are assigned to the production order in SAP Digital Manufacturing Cloud for execution.

Make-to-stock manufacturing is a manufacturing process in which you manufacture products for stock based on demand forecasts.

Make-to-order manufacturing is a manufacturing process in which manufacturing starts only after a customer’s order is received. Forms of MTO vary. For example, an assembly process starts when demand actually occurs or manufacturing starts with development planning.

If no sales order is attached to the production order, the order is used for make-to-stock manufacturing. The system reuses the existing standard BOM and routing if they match the BOM and routing in the production order. Otherwise, the system creates a new standard BOM and routing or a new version of the existing BOM and routing.

- You can download the complete phantom hierarchy including the phantom components and the phantom members from SAP ERP to SAP Digital Manufacturing Cloud for execution.
- You can transfer co-products and by-products defined for the BOM in SAP ERP to SAP Digital Manufacturing Cloud for execution with a production order.
- You can transfer alternate components defined for the BOM in SAP ERP to SAP Digital Manufacturing Cloud for execution with a production order. Among the components in an alternate group, the component with the highest priority becomes the primary component and the other components become alternate components.
Prerequisites

SAP ERP

- This function works only with SAP ERP 6.05 or later with the activated business function LOG_PP_MES_INT_02 (configuration type C and D).
- You have transferred the material master records for the produced material and all the components.
- You have created a BOM and a routing for the produced material (see Manage BOMs and Manage Routings).
- You have created and sent work centers to SAP Digital Manufacturing Cloud for execution.
- You have set up ALE communication to create and transmit LOIPRO IDocs.
- You have also defined the Data Replication Framework (DRF) replication model to replicate LOIPRO IDocs (in Customizing for Production, choose Integration with a Manufacturing Execution System > Basic Settings for MES Integration). For information about the SAP ERP versions supporting DRF, see SAP Note 1793291.
- You have defined unique ISO codes for every unit of measure.

Procedural Steps

1. Create or update a production order containing the BOM and routing master data in SAP ERP.
2. SAP ERP 6.05 and later with the activated business function (BF) LOG_PP_MES_INT_02 distributes production orders automatically upon release based on the Data Replication Framework (DRF) filter settings (see DRF Integration for MES Processes on the SAP Help Portal at http://help.sap.com). Changes to the order are distributed immediately after the initial distribution.

   **i Note**

   SAP ERP 6.05 with the activated BF LOG_PP_MES_INT_01 (configuration type B) distributes production orders automatically upon release based on the customized settings.

   If you use SAP ERP 6.00 – 6.04 (configuration type A), you transfer the production order using the transaction POIT after creating or changing the order.

   **i Note**

   The POIT transaction supports only the IDoc base types LOIPRO01. Additional fields and segments of the IDoc types LOIPRO02, LOIPRO03, and LOIPRO04 are not supplied when distributing using the POIT transaction.

3. Verify the results in SAP Digital Manufacturing Cloud for execution.

The system creates or updates the production order, BOM and routing records in SAP Digital Manufacturing Cloud for execution based on the data received from SAP ERP.
3.2.2.2.1.3 Configuring a Production Order with Serial Numbers

This section describes how to transfer serial numbers assigned to a production order from SAP ERP to SAP Digital Manufacturing Cloud for execution to create corresponding SFC numbers assigned to the production order in SAP Digital Manufacturing Cloud for execution.

- In SAP ERP, serial numbers are unique at the material level. In SAP Digital Manufacturing Cloud for execution, SFC numbers are unique at the system level.
- In an SAP ERP production order, you can define serial numbers for the product to be produced.
- These serial numbers within the production order are distributed automatically to SAP Digital Manufacturing Cloud for execution.
- When a production order with serial numbers is imported from SAP ERP, the corresponding production order and SFC numbers are created using the numbering pattern of `<Material Number>-<Serial Number>`. These SFC numbers are used when you release the production order in SAP Digital Manufacturing Cloud for execution.
- The number of the transferred serial numbers equals the *Quantity value* of the production order (in *Customizing for Production*, choose *Integration with a Manufacturing Execution System* → *Integrate Production Order with a Manufacturing Execution System* → *Check Serial Numbers in MES Production Orders*).

**Prerequisites**

**SAP ERP**

- You have maintained a serial number profile for the header material so that a production order can contain serial numbers (in *Customizing for Logistics*, choose *Materials Management* → *Material Master* → *Material Change* → *Work Scheduling*).
- You have transferred the material master records for the produced material and all the components (see *Material Transfer* on the SAP Help Portal at [http://help.sap.com](http://help.sap.com)).
- You have created a BOM and a routing for the produced material (see *Manage BOMs* and *Manage Routings*).
- You have set up ALE communication to create and transmit LOIPRO IDocs.
- You have also defined the *Data Replication Framework* (DRF) replication model to replicate LOIPRO IDocs (in *Customizing for Production*, choose *Integration with a Manufacturing Execution System* → *Basic Settings for MES Integration*). For information about the SAP ERP versions supporting DRF, see SAP Note 1793291.
- This function works with SAP ERP 6.05 and higher with the activated business function LOG_PP_MES_INT_02. For information about the SAP ERP versions supporting DRF, see SAP Note 1793291.
- You have defined unique ISO codes for every unit of measure.
SAP Digital Manufacturing Cloud for Execution

- (Optional) You have imported BOM and routing master data from SAP ERP.

**i Posting Instructions**

BOM and routing masters that are sent from SAP ERP to SAP Digital Manufacturing Cloud for execution prior to the production order download allow additional manual configurations to happen inside of SAP Digital Manufacturing Cloud for execution. This prerequisite is optional because you can create the BOM and routing master in SAP Digital Manufacturing Cloud for execution directly from the production order download.

**Procedural Steps**

1. Create or update a production order containing serial numbers manually (transaction CO01 and CO02) or automatically by converting a planned order.
2. SAP ERP 6.05 and later with the activated business function (BF) LOG_PP_MES_INT_02 distributes production orders automatically upon release based on the Data Replication Framework (DRF) filter settings (see DRF Integration for MES Processes on the SAP Help Portal at http://help.sap.com). Changes to the order are distributed immediately after the initial distribution.

**i Note**

SAP ERP 6.05 with the activated BF LOG_PP_MES_INT_01 (configuration type B) distributes production orders automatically upon release based on customized settings.

If you use SAP ERP 6.00 – 6.04 (configuration type A), you transfer the production order using the transaction POIT after creating or changing the order.

**i Note**

The POIT transaction supports only the IDoc base types LOIPRO01. Additional fields and segments of the IDoc types LOIPRO02, LOIPRO03, and LOIPRO04 are not supplied when distributing using the POIT transaction.

3. Verify the results in SAP Digital Manufacturing Cloud for execution.

SAP Digital Manufacturing Cloud for execution creates or updates the production order with SFC numbers based on the data received from SAP ERP.

For more information, see Transfer of Production Order with Serial Numbers on the SAP Help Portal at http://help.sap.com.
3.2.2.2.1.4 Configuring a Production Order with a Batch Number

This section describes how to transfer production order data with a batch number from SAP ERP to SAP Digital Manufacturing Cloud for execution to create or update the corresponding production order record in SAP Digital Manufacturing Cloud for execution.

Certain material features cannot always be guaranteed to be exactly alike in production. For example, you cannot guarantee that a certain color will always have the same shade. Minor differences between production lots cannot be avoided. You need to be able to uniquely identify the individual production lots of the same material and manage them separately in inventory.

Materials that require such precise identification, for example pharmaceutical products, are identified and managed in stock according to both, the material number and batch number.

A batch is a quantity of the material produced during a given production run. A batch represents a homogeneous unit with unique specifications. A batch is a subset of the total quantity of a material held in stock. The subset is managed from all other subsets of the same material.

Prerequisites

SAP ERP

- You have transferred the batch managed material master records for the produced material and all the components (see Material Transfer on the SAP Help Portal at http://help.sap.com).
  For more information about creating batch managed material master record, see the Configuring Batch Managed Material section of this guide.
- You have created a BOM and a routing for the produced material (see Manage BOMs and Manage Routings).
- You have created and sent work centers to SAP Digital Manufacturing Cloud for execution.
- You have set up ALE communication to create and transmit LOIPRO IDocs.
- You have also defined the Data Replication Framework (DRF) replication model to replicate LOIPRO IDocs (in Customizing for Production, choose Integration with a Manufacturing Execution System → Basic Settings for MES Integration). For information about the SAP ERP versions supporting DRF, see SAP Note 1793291.
- This function works with SAP ERP 6.05 and higher with activated business function LOG_PP_MES_INT_02. For information about the SAP ERP versions supporting DRF, see SAP Note 1793291.
- You have defined unique ISO codes for every unit of measure.

SAP Digital Manufacturing Cloud for Execution

- (Optional) You have imported BOM and routing master data from SAP ERP.
Posting Instructions

BOM and routing masters that are sent from SAP ERP to SAP Digital Manufacturing Cloud for execution prior to the production order download allow additional manual configurations to happen inside of SAP Digital Manufacturing Cloud for execution. This prerequisite is optional because you can create the BOM and routing master in SAP Digital Manufacturing Cloud for execution directly from the production order download.

Procedural Steps

1. Create a batch-managed material record in SAP ERP (see Configuring a Batch Managed Material section of this guide).
2. Create or update a production order with a defined batch number manually (transaction CO01 and CO02).
3. SAP ERP 6.05 and later with the activated business function (BF) LOG_PP_MES_INT_02 distributes production orders automatically upon release based on the Data Replication Framework (DRF) filter settings (see DRF Integration for MES Processes on the SAP Help Portal at http://help.sap.com). Changes to the order are distributed immediately after the initial distribution.

   **Note**

   SAP ERP 6.05 with the activated BF LOG_PP_MES_INT_01 (configuration type B) distributes production orders automatically upon release based on customized settings.

   If you use SAP ERP 6.00 – 6.04 (configuration type A), you transfer the production order using the transaction POIT after creating or changing the order.

   **Note**

   The POIT transaction supports only the IDoc base types LOIPRO01. Additional fields and segments of the IDoc types LOIPRO02, LOIPRO03, and LOIPRO04 are not supplied when distributing using the POIT transaction.

4. Verify the results in SAP Digital Manufacturing Cloud for execution.

   SAP Digital Manufacturing Cloud for execution creates or updates the production order with SFC numbers based on the data received from SAP ERP.

Related Information

Manage Materials
3.2.2.2.1.5 Configuring a Production Order with Document Info Records

This section describes how to transfer document info records attached to a production order in SAP ERP to create a production order and work instructions attached to the order operations in SAP Digital Manufacturing Cloud for execution.

You can use this function with SAP ERP 6.0 EHP 6 or higher.

Documents from document management that you have assigned to the order header or to the operations directly or that you have defined as a production resource/tool at operation level are communicated to SAP Digital Manufacturing Cloud for execution with the IDoc. Before distributing the order, the system checks whether the assigned documents were released. A URL that is part of the respective IDoc segments that provides an Internet Communication Framework (ICF) service of the ERP system can be used to access the originals linked to the documents. In this way, documents that are in the vault in document management can also be retrieved.

Data is transmitted over a secure connection (https port). To enable data transmission, you must activate the service for structuring and reading a URL for this purpose. To do that, choose transaction SICF, browse for DEFAULT_HOST in the Virtual Host field and choose Execute. Expand $default_host $sap $co_mes_int $co_mes_document $.. Select the service and choose Activate in the Service/Host menu.

Note

If you want to allow several users to access an original document with the URL, ensure that the original is located in the SAP vault or in a network directory and not stored locally.

For more information, see Production Order on the SAP Help Portal at http://help.sap.com.

Prerequisites

SAP ERP

- You have transferred the material master records for the produced material and all the components (see Material Transfer on the SAP Help Portal at http://help.sap.com).
- You have created a BOM and a routing for the produced material (see Manage BOMs and Manage Routings).
- You have created and sent work centers to SAP Digital Manufacturing Cloud for execution.
- You have set up ALE communication to create and transmit LOIPRO IDocs.
- You have also defined the Data Replication Framework (DRF) replication model to replicate LOIPRO IDocs (in Customizing for Production, choose Integration with a Manufacturing Execution System $Basic Settings for MES Integration $). For information about the SAP ERP versions supporting DRF, see SAP Note 1793291.
- You have defined unique ISO codes for every unit of measure.
- You have created and released a document info record of the type PRT or Non-PRT (transaction CV01N) in SAP ERP.
SAP Digital Manufacturing Cloud for Execution

- (Optional) You have imported BOM and routing master data from SAP ERP.

### Posting Instructions

BOM and routing masters that are sent from SAP ERP to SAP Digital Manufacturing Cloud for execution prior to the production order download allow additional manual configurations to take place inside of SAP Digital Manufacturing Cloud for execution. This prerequisite is optional because you can create the BOM and routing master in SAP Digital Manufacturing Cloud for execution directly from the production order download.

### Procedural Steps

1. Create or update a production order manually (transaction CO01 and CO02) or automatically by converting a planned order.
2. To attach one or more document info records to a production order header, enter the document type.
3. Release and save the production order after attaching the document info records.
4. SAP ERP 6.05 and later with the activated business function (BF) LOG_PP_MES_INT_02 distributes production orders automatically upon release based on the Data Replication Framework (DRF) filter settings (see **DRF Integration for MES Processes** on the SAP Help Portal at http://help.sap.com). Changes to the order are distributed immediately after the initial distribution.

#### Note

SAP ERP 6.05 with the activated BF LOG_PP_MES_INT_01 (configuration type B) distributes production orders automatically upon release based on customizing settings. If you use SAP ERP 6.00 – 6.04 (configuration type A), you transfer the production order using the transaction POIT after creating or changing the order.

#### Note

The POIT transaction supports only the IDoc base types LOIPRO01. Additional fields and segments of the IDoc types LOIPRO02, LOIPRO03, and LOIPRO04 are not supplied when distributing using the POIT transaction.

5. When the production order is sent to SAP ME, SAPMEINT creates the following records in SAP Digital Manufacturing Cloud for execution:
   - Production order with operation activities and attachment points for the work instructions
   - Routing
   - Operation activities
   - Work instructions
6. Verify the results in SAP Digital Manufacturing Cloud for execution.

For more information, see **Work Instruction** on the SAP Help Portal at http://help.sap.com.
3.2.2.1.6 Configuring a Production Order with Scheduling Information

This section describes how to transfer a production order with scheduling information from SAP ERP to create or update the corresponding production order with quantity splits associated with resources at a specific routing step in SAP Digital Manufacturing Cloud for execution.

The production order is used by production planning in SAP ERP to define the material to be processed, the location, the time, and the work required. You can also plan the resources to be used in the Shop Floor Designer in Digital Manufacturing Cloud for execution.

You can control and monitor short-term planning on your shop floor. Typical users are production supervisors, foremen, or shift managers.

The release of the production order in SAP Digital Manufacturing Cloud for execution triggers production on the shop floor (see Order Schedule Information).

Prerequisites

**SAP ERP**

- You have transferred the material master records for the produced material and all the components (see Material Transfer on the SAP Help Portal at http://help.sap.com).
  For more information about creating a batch-managed material master record, see the Configuring Batch Managed Material section of this guide.
- You have created a BOM and a routing for the produced material (see Manage BOMs and Manage Routings).
- You have transferred the work centers with individual capacities.
- You have set up ALE communication to create and transmit LOI PRO IDocs.
- You have also defined the Data Replication Framework (DRF) replication model to replicate LOI PRO IDocs (in Customizing for Production, choose Integration with a Manufacturing Execution System > Basic Settings for MES Integration). For information about the SAP ERP versions supporting DRF, see SAP Note 1793291.
- You have defined unique ISO codes for every unit of measure.

**SAP Digital Manufacturing Cloud for Execution**

- You have imported a work center and resources from SAP ERP.
- (Optional) You have imported BOM and routing master data from SAP ERP.

Posting Instructions

BOM and routing masters that are sent from SAP ERP to SAP Digital Manufacturing Cloud for execution prior to the production order download allow additional manual configurations to take place.
inside of SAP Digital Manufacturing Cloud for execution. This prerequisite is optional because you can create the BOM and routing master in SAP Digital Manufacturing Cloud for execution directly from the production order download.

**Procedural Steps**

1. Create or update a production order manually (transaction CO01 and CO02) or automatically by converting a planned order.
2. Allocate the production order quantity to specific resources for an operation to schedule production. This generates a unique split ID for each resource assigned to an operation.
3. Send the production order with scheduling information from SAP ERP to SAP Digital Manufacturing Cloud for execution.
4. SAP ERP 6.05 and later with the activated business function (BF) LOG_PP_MES_INT_02 distributes production orders automatically upon release based on the Data Replication Framework (DRF) filter settings (see DRF Integration for MES Processes on the SAP Help Portal at http://help.sap.com). Changes to the order are distributed immediately after the initial distribution.

**i Note**

SAP ERP 6.05 with the activated BF LOG_PP_MES_INT_01 (configuration type B) distributes production orders automatically upon release based on customized settings.

If you use SAP ERP 6.00 – 6.04 (configuration type A), you transfer the production order using the transaction POIT after creating or changing the order.

**i Note**

The POIT transaction supports only the IDoc base types LOIPRO01. Additional fields and segments of the IDoc types LOIPRO02, LOIPRO03, and LOIPRO04 are not supplied when distributing using the POIT transaction.

5. Verify the results in SAP Digital Manufacturing Cloud for execution.

SAP Digital Manufacturing Cloud for execution creates or updates the production order containing scheduling information based on the data received from SAP ERP.

### 3.2.2.2.17 Transfer of Production Order with Operation-Level Scheduling

This section describes how to transfer a production order with operation-level scheduling information from SAP ERP to create or update the corresponding production order that contains the operation start and end time in SAP Digital Manufacturing Cloud for execution.

The production order is used by production planning in SAP ERP to define the material to be processed, the location, the time, and the work required. Release of the production order in SAP Digital Manufacturing Cloud for execution triggers production on the shop floor.
Prerequisites

SAP ERP

- You have transferred the material master records for the produced material and all the components (see Material Transfer on the SAP Help Portal at http://help.sap.com).
- You have created a BOM and a routing for the produced material (see Manage BOMs and Manage Routings).
- You have transferred the work centers with individual capacities to SAP Digital Manufacturing Cloud for execution.
- You have created a production order either manually or by converting a planned order automatically.
- You have set up ALE communication to create and transmit LOIPRO IDocs.
- You have also defined the Data Replication Framework (DRF) replication model to replicate LOIPRO IDocs (in Customizing for Production, choose Integration with a Manufacturing Execution System Basic Settings for MES Integration). For information about the SAP ERP versions supporting DRF, see SAP Note 1793291.
- You have defined unique ISO codes for every unit of measure.

SAP Digital Manufacturing Cloud for Execution

- (Optional) You have imported the BOM and routing master data from SAP ERP.

Posting Instructions

BOM and routing masters that are sent from SAP ERP to SAP Digital Manufacturing Cloud for execution prior to the production order download allow additional manual configurations to take place inside of SAP Digital Manufacturing Cloud for execution. This prerequisite is optional because you can create the BOM and routing master in SAP Digital Manufacturing Cloud for execution directly from the production order download.

Procedural Steps

1. Create a production order with scheduling information either manually or by converting a planned order automatically or update the production order in SAP ERP.

   Note

   Scheduling can be defined by using Material Requirement Planning (MRP) and detailed scheduling in SAP Advanced Planning and Optimization (APO).

2. SAP ERP 6.05 and later with the activated business function (BF) LOG_PP_MES_INT_02 distributes production orders automatically upon release based on the Data Replication Framework (DRF) filter settings (see DRF Integration for MES Processes on the SAP Help Portal at http://help.sap.com). Changes to the order are distributed immediately after the initial distribution.
SAP ERP 6.05 with the activated BF LOG_PP_MES_INT_01 (configuration type B) distributes production orders automatically upon release based on customized settings.

If you use SAP ERP 6.00 – 6.04 (configuration type A), you transfer the production order using the transaction POIT after creating or changing the order.

The POIT transaction supports only the IDoc base types LOIPRO01. Additional fields and segments of the IDoc types LOIPRO02, LOIPRO03, and LOIPRO04 are not supplied when distributing using the POIT transaction.

3. Verify the results in SAP Digital Manufacturing Cloud for execution.

The system creates or updates the corresponding production order containing scheduling information in SAP Digital Manufacturing Cloud for execution.

When the order is released in SAP Digital Manufacturing Cloud for execution, shop floor operators can see the operation start and end time in the POD worklist.

### 3.2.2.1.8 Transferring a Production Order with PRT Assignment

This section describes how to transfer production order data with PRT assignment from SAP ERP or SAP S/4HANA to SAP Digital Manufacturing Cloud for execution to create or update the corresponding production order record in SAP Digital Manufacturing Cloud for execution.

**Note**

You can only transfer production order with equipment or material PRT assignment.

### Prerequisites

**SAP ERP or SAP S/4HANA**
- You have completed all the prerequisites of Transferring a Production Order [page 72].
- The equipment PRT has already been transferred from SAP ERP or SAP S/4HANA to SAP Digital Manufacturing Cloud for execution. For detailed procedures, see Transferring a Tool [page 69].
- The material PRT has been transferred from SAP ERP or SAP S/4HANA to SAP Digital Manufacturing Cloud for execution together with the material master data.
- The PRTs have already been assigned to routing operations.

**SAP Digital Manufacturing Cloud**
- The collaboration link COLLABORATION_PRT_ASSIGNMENT_GET is mapped to the directive ERP_PRT_ASSIGNMENT_GET in the Manage Collaboration Links app.
**Procedure**

1. Create or update a production order manually (transaction CO01 and CO02) or automatically by converting a planned order (see Creating a Production Order on the SAP Help Portal at http://help.sap.com).
2. SAP ERP 6.05 and later with the activated business function (BF) LOG_PP_MES_INT_02 distributes production orders automatically upon release based on the Data Replication Framework (DRF) filter settings. Changes to the order are distributed immediately after the initial distribution.
3. Verify the results in the Manage Orders or the Monitor Integration Messages app in SAP Digital Manufacturing Cloud for execution.

**3.2.2.2.2 Production Order Status Confirmation**

This section describes how to transfer the results of the production from SAP Digital Manufacturing Cloud for execution back to the production order in SAP ERP for reporting steps to keep the status of the systems aligned.

A status confirmation documents the processing status of orders, operations, sub-operations and individual capacities. It is an instrument for controlling orders.

With a confirmation you specify the following:

- The quantity in an operation that was produced as yield, scrap and the quantity to be reworked
- How much work was actually done
- Which work center was used for the operation
- Who performed the operation

Exact confirmation shortly after completion of an operation is essential for realistic production planning and control.

**3.2.2.2.2.1 Production Yield Confirmation on Operation Complete**

This section describes how to transfer a production yield confirmation message to SAP ERP.

The message is triggered when the SFC number belonging to the production order completes an operation marked as the SAP ERP reporting step.

> **i Note**

An SFC number can be re-processed at an operation that the SFC number has already completed.

This function supports long material numbers (see Configuring a Long Material Number [page 54]).

For more information about reporting consumed components, see the Transfer of Goods Movement within Yield/Scrap Confirmation section of this guide.
**Prerequisites**

**SAP ERP**

- You have verified that the control keys of the operations do not allow *Auto Goods Receipt* and that they allow confirmations (see *Control Key* on the SAP Help Portal at [http://help.sap.com](http://help.sap.com) and SAP Note [1502536](http://help.sap.com)).
- You have verified that all work centers have the same activity types arranged in the same sequence.
- You have verified that operations are not marked as milestone operations.
- You have verified that the operation sequence is not checked (see *Logistics* > *Production* > *Shop Floor Control* > *Operations* > *Confirmation* > *Define Confirmation Parameters (transaction OPK4)*).

**SAP Digital Manufacturing Cloud for Execution**

- You have imported the production order data from SAP ERP.
- You have released the production order to the shop floor.
- You have verified that routings contain at least one ERP reporting step. We recommend that you mark the last routing operation as an ERP reporting step to ensure that all consumed components are reported to SAP ERP.
- You have verified that collaboration links and directives are configured.

**Procedural Steps**

1. Complete an SFC number that belongs to the production shop order at the ERP reporting step.
2. The system triggers a collaboration event and sends the `yieldConfirmationRequest` message to update the processing status of the production order and operations in SAP ERP.

<table>
<thead>
<tr>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>In SAP ERP, you can see the status of the production order on the <em>Display Production Order Confirmation: Details</em> screen (transaction CO14). If the production shop order contains scheduling information that has been transferred, then the confirmation message also contains quantity split IDs and the capacity category.</td>
</tr>
</tbody>
</table>
3.2.2.2.2 Scrap Confirmation for a Production Order

This section describes how to transfer scrap data for the production order to SAP ERP when an SFC number is scrapped during production in SAP Digital Manufacturing Cloud for execution.

When an SFC number is scrapped, the system reports consumption of the components for this SFC number with a goods issue of the movement type 261.

If components were reserved for this shop order in SAP ERP, the consumption of these components is not reported to SAP ERP.

This function supports long material numbers (see Configuring a Long Material Number [page 54]).

For more information about reporting consumed components, see the Transferring a Goods Movement within Yield/Scrap Confirmation section of this guide.

Prerequisites

SAP ERP

- You have verified that all work centers have the same activity types arranged in the same sequence.
- You have verified that the operation sequence is not checked (see Logistics > Production > Shop Floor Control > Operations > Confirmation > Define Confirmation Parameters (transaction OPK4)).

SAP Digital Manufacturing Cloud for Execution

- You have imported the production order data from SAP ERP.
- You have released the production order to the shop floor.
- You have verified that routings contain at least one ERP reporting step. We recommend that you mark the last routing operation as an ERP reporting step to ensure that all consumed components are reported to SAP ERP.
- You have verified that collaboration links and directives are configured.

Procedural Steps

1. Scrap an SFC number belonging to the production order in SAP Digital Manufacturing Cloud for execution using Log NC.
2. The system triggers a collaboration event and sends the scrapConfirmationRequest message with the following information to SAP ERP to report the quantity of scrapped finished goods and component quantities consumed:
   - Plant: SAP Digital Manufacturing Cloud for execution
○ Production Order: Production order number.
○ Operation: Operation activity name.
○ Quantity: Quantity that has been scrapped.
○ Base Unit of Measure: Units of measure of the produced material.
○ Capacity Category: Capacity Category of the resource that was used to complete SFC number.
○ Split: Yield of a split that was processed by a capacity when an operation is split.
○ Components: Assembled components (see Transferring a Goods Movement within Yield/Scrap Confirmation section of this guide for more details).

**i Note**
The system does not send a serial number for a scrapped SFC number to SAP ERP.

**i Note**
If an SFC is scrapped on the non-reporting step, SAP Digital Manufacturing Cloud for execution tries to find a reporting step in the routing by checking future steps and uses the reporting step it finds.

In SAP ERP, you can see the status of the production order on the Display Production Order Confirmation: Details screen (transaction CO14).

If the production order contains transferred scheduling information, then the confirmation message also contains quantity split IDs and the capacity category.

### 3.2.2.2.2.3 Transferring a Goods Movement within Yield/Scrap Confirmation

This section describes how to transfer goods movement (Goods Issue/Goods Receipt) to SAP ERP within production yield confirmations, scrap confirmations for production orders, and container close messages.

**i Note**
An SFC number can be re-processed at an operation that this SFC number has already completed.

This function supports long material numbers.

**Prerequisites**

**SAP ERP**

- You have verified that the control keys of the operations do not allow Auto Goods Receipt but allow confirmations (see Control Key on the SAP Help Portal at http://help.sap.com and SAP Note 1502536).
- You have verified that all work centers have the same activity types arranged in the same sequence.
You have verified that operations are not marked as milestone operations.

You have verified that the operation sequence is not checked (see "Logistics » Production » Shop Floor Control » Operations » Confirmation » Define Confirmation Parameters (transaction OPK4) »

**SAP Digital Manufacturing Cloud for execution**

- You have imported the production order with BOM and routing data from SAP ERP.
- You have released the production order to the shop floor.
- You have received floor stock from SAP ERP.
- You have verified that routings contain at least one ERP reporting step. We recommend that you mark the last routing operation as an ERP reporting step to ensure that all consumed components are reported to SAP ERP.
- You have verified that collaboration links and directives are configured.

**Procedure**

1. Assemble a discrete component (by choosing Add in the Assembly Point or As-Built Configuration plugin, or when a component is assembled using the Auto Assemble Component hook point activity) or a time-based component.
2. Complete an SFC number belonging to the production shop order at the ERP reporting step, scrap it, or pack it in the container and close it.
3. The system triggers a collaboration event and sends a confirmation message that contains a goods movement section with the goods movement type 261 (goods issue for an order) for the assembled component to SAP ERP.

Goods movement is not triggered for phantom components. Goods movement is triggered for components that are members of a phantom component.

Goods movement is not triggered for co-products and by-products.

Goods movement is not triggered for floor stock pegged to a shop order.

Goods movement is triggered for non-BOM components.

Note: Goods movement section is included in the following messages:

- `yieldConfirmationRequest`
- `scrapConfirmationRequest`
3.2.2.2.4 Transferring a Goods Movement (Goods Issue) Independent of Yield Confirmation

This section describes how to transfer a goods movement to SAP ERP on assembly of discrete components of a top assembly in SAP Digital Manufacturing Cloud for execution.

**i Note**

This function does not support time-based and backflushed components.

**Prerequisites**

**SAP ERP**

- You have verified that the component materials are not marked as backflushed (the Backflush checkbox on the MRP 2 tab of the MM01/MM02 transaction).

**SAP Digital Manufacturing Cloud for Execution**

- In Collaboration Link Maintenance, you have verified that the ERP_COMPONENT_ADD directive is assigned to the COLLABORATION_SFC_COMPONENT_ADD link.
- You have imported the production order data from SAP ERP.
- You have received floor stock from SAP ERP.
- You have released the production order to the shop floor.

**Procedural Steps**

1. Choose Add in the Assembly Point (Assemble Components) or As-Built Configuration plugin to indicate that you have assembled a discrete component.
2. SAP Digital Manufacturing Cloud for execution triggers a collaboration action (COLLABORATION_SFC_COMPONENT_ADD).
3. The system sends the componentAddRequest message with the goods movement type 261 (goods issue for an order) for the assembled component to SAP ERP.

**i Note**

This component is not included in production yield confirmation.
3.2.2.2.2.5 Production Order Complete

This section describes how to transfer a production order complete confirmation message to SAP ERP.

The message is triggered when one of the following occurs in SAP Digital Manufacturing Cloud for execution:

- All SFC numbers belonging to a production shop order are completed at the operation marked as the last ERP reporting step (the Is Last Reporting Step checkbox in Routing Step Properties) and the status of the order changes to Done.
- Status of the production shop order changes to Closed.

Prerequisites

**SAP ERP**

- You have verified that the control keys of the operations do not allow Auto Goods Receipt but allow confirmations (see Control Key on the SAP Help Portal at http://help.sap.com and SAP Note 1502536).
- You have verified that all work centers have the same activity types arranged in the same sequence.
- You have verified that operations are not marked as milestone operations.
- You have verified that the operation sequence is not checked (see Logistics > Production > Shop Floor Control > Operations > Confirmation > Define Confirmation Parameters (transaction OPK4)).

**SAP Digital Manufacturing Cloud for Execution**

- You have imported the production order data from SAP ERP.
- You have released the production order to the shop floor.
- You have verified that routings contain at least one ERP reporting step.
  
  We recommend that you mark the last routing operation as the ERP reporting step to ensure that all consumed components are reported to SAP ERP.
- You have verified that collaboration links and directives are configured.

Procedural Steps

1. Change the status of the production shop order to Done (this can be done manually or by completing all SFC numbers belonging to the order at the operation marked as the last ERP reporting step) or Closed.
2. SAP Digital Manufacturing Cloud for execution triggers a collaboration event.
3. The system sends the productionOrderCompleteRequest message to update the processing status of the production order in SAP ERP.
   
   In SAP ERP, you can see the status of the production order on the Display Production Order Confirmation: Details screen (transaction CO14).
3.2.2.2.2.6 Report Serial and Batch Numbers for Semi-Finished Components

This section describes how to transfer a serial and batch number for semi-finished components to SAP ERP within production yield confirmation, planned order confirmation, scrap confirmation for production and planned orders, and container close messages.

Prerequisites

SAP ERP

- You have configured Batch Management.
- You have maintained a serial number profile for the header material so that a production order can contain serial numbers (in Customizing for Logistics, choose Materials Management > Material Master > Material Change > Work Scheduling).
- You have verified that the control keys of the operations do not allow Auto Goods Receipt but allow confirmations (see Control Key on the SAP Help Portal at http://help.sap.com and SAP Note 1502536).
- You have verified that all work centers have the same activity types arranged in the same sequence.
- You have verified that operations are not marked as milestone operations.
- You have verified that the operation sequence is not checked (see Logistics > Production > Shop Floor Control > Operations > Confirmation > Define Confirmation Parameters (transaction OPK4)).
- You have set up ALE communication to create and transmit LOIPRO IDocs.
- You have also defined the Data Replication Framework (DRF) replication model to replicate LOIPRO IDocs (in Customizing for Production, choose Integration with a Manufacturing Execution System > Basic Settings for MES Integration). For information about the SAP ERP versions supporting DRF, see SAP Note 1793291.
- You have defined unique ISO codes for every unit of measure.

SAP Digital Manufacturing Cloud for Execution

- You have imported the material master records for the produced material and all the components.
- For materials to be assembled, you have specified which data will be collected on assembly:
  - SFC or INV_SFC
- You have imported the production order with BOM and routing data from SAP ERP.
- You have released the production shop order to the shop floor.
- You have received floor stock from SAP ERP.
- You have verified that routings contain at least one ERP reporting step.
- We recommend that you mark the last routing operation as the ERP reporting step to ensure that all consumed components are reported to SAP ERP.
- You have verified that collaboration links and directives are configured in ERP.
Procedural Steps

1. Create a semi-finished material record in SAP ERP. It has to be either batch-managed or with an assigned serial number profile.
2. Create a finished material record with the BOM containing semi-finished material.
3. Create and release a production order in SAP ERP for semi-finished material. Release this order in SAP Digital Manufacturing Cloud for execution and complete SFC numbers until they get the status of Done.
4. Create and release a production order for your top assembly material (finished material).
5. Assemble a semi-finished component using either discrete (by choosing Add in the Assembly Point or As-Built Configuration plugin) or time-based assembling.

   i Note
   Reporting of serial numbers is not supported for time-based components.

   i Note
   The SFC number has to be collected for the component during assembly.

6. Complete an SFC number belonging to the production shop order at the ERP reporting step, scrap it or pack to the container and close it.
7. SAP Digital Manufacturing Cloud triggers a collaboration event.
8. The system sends a confirmation message that contains a goods movement section with the goods movement type 261 (goods issue for an order) for the assembled component to SAP ERP.

   Note: The goods movement section is included in the following types of messages:
   • yieldConfirmationRequest
   • scrapConfirmationRequest

3.2.2.2.3 Process Order Integration

This section describes how to transfer process orders from SAP ERP or SAP S/4HANA to SAP Digital Manufacturing Cloud for execution to create corresponding orders in SAP Digital Manufacturing Cloud for execution.

Prerequisites

SAP ERP or SAP S/4HANA

- You have created work centers with plant and production-relevant data in the Logistics module (see Creating, Changing and Displaying Work Centers on the SAP Help Portal at http://help.sap.com). You have transferred work centers to SAP Digital Manufacturing Cloud for execution.
- You have created a BOM and a routing / recipe for the produced material (see Manage BOMs, Manage Routings and Manage Recipes).
- You have transferred materials to SAP Digital Manufacturing Cloud for execution.
You have set up ALE communication to create and transmit an LOIPRO05 IDoc.

**Procedure**

1. Create or update a process order manually (transaction COR1 and COR2) or automatically by converting a planned order.
2. Execute the report RCCLORD to replicate LOIPRO05 IDoc to SAP Digital Manufacturing Cloud for execution.
3. Or, if you want to Data Replication Framework (DRF) to transfer the order, you can simply release the process order. The system transfers the order data to SAP Digital Manufacturing Cloud using IDoc LOIPRO05 according to the filter criteria you set in the DRF. For more information, see [DRF Integration for MES Processes](http://help.sap.com) on the SAP Help Portal at [http://help.sap.com](http://help.sap.com).

**i Note**

If you enable transfer of process orders via DRF, make sure you checked these notes: SAP Note [2888888](https://help.sap.com), SAP Note [2931412](https://help.sap.com) and SAP Note [3017004](https://help.sap.com).

4. Verify the results in Manage Orders and Monitor Integration Messages apps in SAP Digital Manufacturing Cloud for execution.

The system creates or updates the process order based on the data received from SAP ERP or SAP S/4HANA. When the order is released in SAP Digital Manufacturing Cloud for execution, shop floor operators can see the operation start and end time in the POD worklist.

**Related Information**

Manage Orders

**3.2.2.3.1 Transferring a Process Order with Inspection Lot (type 03)**

This section describes how to transfer the inspection lot (inspection type 03) and inspection characteristics assigned to a process order from SAP ERP or SAP S/4HANA to SAP Digital Manufacturing Cloud for execution.

- In SAP ERP or SAP S/4HANA, an inspection lot documents a request for an inspection. Inspection characteristics are assigned to the inspection lot.
- In SAP ERP, the type 03 inspection lot refers to in-process inspection that takes place in production. With in-process inspections, an inspection lot is created for a process order. Characteristics are assigned to individual operations in the master recipe.
- When a process order with inspection lot / inspection characteristics are transferred from SAP ERP or SAP S/4HANA, the corresponding orders are created and inspection characteristics can be viewed at SFC operation level in the Order POD (Default).
Prerequisites

SAP ERP and SAP S/4HANA

- You have completed all the prerequisites of Configuring a Process Order [page 93].
- Inspection characteristics have been assigned to individual operations in the master recipe.

SAP Digital Manufacturing Cloud

- You have set up ALE communication to create and transmit an LOIPRO05 IDoc. For more information

Procedure

1. Create a process order with inspection lot / inspection characteristics assigned to it (transaction COR1 and COR2).
2. Release the process order. The system transfers the order data to SAP Digital Manufacturing Cloud using IDoc LOIPRO05 according to the filter criteria you set in the DRF. For more information, see DRF Integration for MES Processes on the SAP Help Portal at http://help.sap.com.

   i Note

   If you enable transfer of process orders via DRF, make sure you checked these notes: SAP Note 2888888, SAP Note 2931412 and SAP Note 3017004.

3. Verify the results in the Manage Orders and Monitor Integration Messages apps in SAP Digital Manufacturing Cloud for execution.

   The system creates the process order based on the data received from SAP ERP or SAP S/4HANA.

   When the order is released in SAP Digital Manufacturing Cloud for execution, shop floor operators can see the inspection characteristics at operation level in the Order POD (Default).

Related Information

Process Order Integration [page 93]
3.2.2.2.4 Process Order Status Confirmation

This section describes how to transfer the results of the production from SAP Digital Manufacturing Cloud for execution back to the process order in SAP ERP or SAP S/4HANA for reporting steps to keep the status of the systems aligned.

A status confirmation documents the processing status of orders, operations and inventory movements. It is an instrument for controlling orders.

With a confirmation you specify the following:

- The quantity in an operation that was produced as yield or scrap.
- The progress of the order.
- Who performed the operation.
- Production activities that are completed at the phase level of an order.

Exact confirmation shortly after completion of an operation is essential for realistic production planning and control.

Related Information

Goods Issue / Goods Receipt [page 96]
Quantity Confirmation [page 97]
Activity Confirmation [page 98]

3.2.2.2.4.1 Goods Issue / Goods Receipt

You can transfer a goods movement (goods issue / goods receipt) of process order to SAP ERP or SAP S/4HANA within a production yield confirmation.

The yield confirmation message is triggered when the SFC number belonging to the process order completes an operation marked as the SAP ERP or SAP S/4HANA reporting step.

Prerequisites

SAP ERP or SAP S/4HANA

- You have verified that the control keys of the operations do not allow Auto Goods Receipt and that they allow confirmations (see Control Key on the SAP Help Portal at http://help.sap.com and SAP Note 1502536).
- You have verified that all work centers have the same activity types arranged in the same sequence.
- You have verified that operations are not marked as milestone operations.
- You have verified that the operation sequence is not checked (see Logistics > Production > Shop Floor Control > Operations > Confirmation > Define Confirmation Parameters (transaction OPK4)).
SAP Digital Manufacturing Cloud

- The process order data is transferred from SAP ERP or SAP S/4HANA.
- The process order is released to the shop floor.
- The recipe contains at least one ERP reporting step.
- The collaboration link `COLLABORATION_ERP_YIELD_CONFIRMATION` is mapped to the directive `ERP_YIELD_CONFIRMATION` in the Manage Collaboration Links app.

Procedure

1. Create goods receipt or choose Assembly to trigger the goods issue posting.
2. The system triggers a collaboration event and sends the `COLLABORATION_ERP_YIELD_CONFIRMATION` message to trigger postings of goods issue / goods receipt in SAP ERP or SAP S/4HANA.

   \[\text{i Note}\]
   
   In SAP ERP or SAP S/4HANA, you can see the status of the process order on the Display Process Order Confirmation: Details screen (transaction CORT).

3.2.2.2.4.2 Quantity Confirmation

You can transfer a quantity confirmation message from SAP Digital Manufacturing Cloud for execution to SAP ERP.

Prerequisites

**SAP ERP**

- You have verified that the control keys of the operations do not allow Auto Goods Receipt and that they allow confirmations (see Control Key on the SAP Help Portal at http://help.sap.com and SAP Note 1502536).
- You have verified that all work centers have the same activity types arranged in the same sequence.
- You have verified that operations are not marked as milestone operations.
- You have verified that the operation sequence is not checked (see \[Logistics \ Production \ Shop Floor Control \ Operations \ Confirmation \ Define Confirmation Parameters (transaction OPK4)\]).

**SAP Digital Manufacturing Cloud**

- The process order data is transferred from SAP ERP.
- The process order is released to the shop floor.
- The recipe contains at least one ERP reporting step.
- The collaboration link `COLLABORATION_QUANTITY_CONFIRMATION` is mapped to the directive `QUANTITY_CONFIRMATION` in the Manage Collaboration Links app.
Procedure

1. In the Order POD (Default), post quantities in the Quantity Confirmation tab.
2. The system triggers a collaboration event and sends the COLLABORATION_QUANTITY_CONFIRMATION message to trigger the posting of quantity confirmation in SAP ERP.

Related Information

Quantity Confirmation

3.2.2.2.4.3 Activity Confirmation

You can transfer an activity confirmation message from SAP Digital Manufacturing Cloud for execution to SAP ERP or SAP S/4HANA.

Prerequisites

SAP ERP or SAP S/4HANA

- You have verified that the control keys of the operations do not allow Auto Goods Receipt and that they allow confirmations (see Control Key on the SAP Help Portal at http://help.sap.com and SAP Note 1502536).
- You have verified that all work centers have the same activity types arranged in the same sequence.
- You have verified that operations are not marked as milestone operations.
- You have verified that the operation sequence is not checked (see Logistics ➤ Production ➤ Shop Floor Control ➤ Operations ➤ Confirmation ➤ Define Confirmation Parameters (transaction OPK4)).

SAP Digital Manufacturing Cloud

- The process order data is transferred from SAP ERP or SAP S/4HANA.
- The process order is released to the shop floor.
- The recipe contains at least one ERP reporting step.
- The collaboration link COLLABORATION_ACTIVITY_CONFIRMATION is mapped to the directive ACTIVITY_CONFIRMATION in the Manage Collaboration Links app.

Procedure

1. In the Order POD (Default), post activity confirmation for the process order.
2. The system triggers a collaboration event and sends the COLLABORATION_ACTIVITY_CONFIRMATION message to trigger the posting of activity confirmation in SAP ERP.
### 3.2.2.2.5 Batch Characteristics Update

You can update batch characteristic values and synchronize the data from SAP Digital Manufacturing Cloud to SAP ERP or SAP S/4HANA.

**Note**

At the moment, this function is supported only for process orders.

### Prerequisites

**SAP ERP or SAP S/4HANA**

- Batch-managed materials are created in SAP ERP or SAP S/4HANA and are transferred to SAP Digital Manufacturing Cloud.
- Batch characteristics are assigned to the batch-managed material in SAP ERP or SAP S/4HANA.

### Procedure

- Update batch characteristic values for the process order you want to work on.
- The system updates the batch characteristics data for respective material in SAP ERP or SAP S/4HANA.

### Related Information

**Updating Batch Characteristics**

### 3.2.2.2.6 Batch Creation

You can transfer batch number created in SAP Digital Manufacturing Cloud to SAP ERP or SAP S/4HANA.

The batch creation message is triggered when batch number is created in SAP Digital Manufacturing Cloud.
Prerequisites

SAP ERP or SAP S/4HANA

- Batch-managed materials are created in SAP ERP or SAP S/4HANA and are transferred to SAP Digital Manufacturing Cloud.

SAP Digital Manufacturing Cloud

- The collaboration link `COLLABORATION_BATCH_CREATION` is mapped to the directive `BATCH_CREATION` in the Manage Collaboration Links app.

Procedure

- Create a batch number for the process order you want to work on.
- The system triggers a collaboration event and sends the `COLLABORATION_BATCH_CREATION` message to update the batch data for respective material in SAP ERP.

Related Information

Creating Batch Numbers

3.2.2.2.7 Inspection Characteristics Integration (Process Order and Order-Based Production Order)

You can transfer inspection characteristics of an order from SAP ERP or SAP S/4HANA to SAP Digital Manufacturing Cloud for execution.

Prerequisites

SAP ERP or SAP S/4HANA

- An order exists for the material.
- QM is active for the material to be inspected. That means that in the inspection setup in the material master, the following applies:
  - An inspection type is active for inspection lot origin 03 (inspection during production)
  - The other indicators for the inspection type are set appropriately to meet your requirements for inspection lot processing.
- Inspection characteristics were created and assigned to one or more operations / phases used in the order.

SAP Digital Manufacturing Cloud
The **Order POD** is already configured with the **Quality Inspection Characteristic List** and the **Quality Inspection Results** plugins.

**Procedure**

An inspection during production is triggered by the release of a production order.

1. Release the order in SAP ERP or SAP S/4HANA.
2. Check and release the respective order in the *Manage Orders* app.
3. In the **Order POD**, select a specific order and you can verify the inspection characteristics of a specific operation / phase on the **Quality Inspection Characteristic List** tab.

**Related Information**

Inspection Results Recording (Process Order and Order-Based Production Order) [page 101]

**3.2.2.2.8 Inspection Results Recording (Process Order and Order-Based Production Order)**

You can record inspection results and synchronize the data from SAP Digital Manufacturing Cloud for execution to SAP ERP or SAP S/4HANA.

**Prerequisites**

**SAP ERP or SAP S/4HANA**

Inspection characteristics have been transferred from SAP ERP or SAP S/4HANA to SAP Digital Manufacturing Cloud. For more information, see Inspection Characteristics Integration (Process Order and Order-Based Production Order) [page 100].

**SAP Digital Manufacturing Cloud**

- The collaboration link **COLLABORATION_INSPECTION_LOT** is mapped to the directive **INSPECTION_LOT** in the *Manage Collaboration Links* app.
- The Order POD is already configured with the **Quality Inspection Results** and the **Quality Inspection Results** plugins.
Procedure

1. In Manage Orders app, release the order for which the inspection is to be carried out.
2. In the Order POD, record the inspection results. Make sure you entered values for all mandatory inspection characteristics.
3. Select one inspection characteristic and navigate to the details screen. There you can record the inspection results. Make sure you entered values for all mandatory inspection characteristics.
4. Choose Save to save your entries.
5. On the characteristics overview screen, choose Submit Results to synchronize the results back to SAP ERP or SAP S/4HANA.

Related Information

Inspection Characteristics Integration (Process Order and Order-Based Production Order) [page 100]

3.2.2.2.9 Work Instruction (DMS Document) Integration

This function lets you transfer the document info records from SAP ERP to create work instructions in SAP Digital Manufacturing Cloud for execution.

In particular, you can do the following:

- Transfer document info records attached to the production order
- Transfer document info records attached to routing operations

For more information about transferring document info records that are attached to the production order, see Configuring a Production Order with Document Info Records [page 79].

3.2.2.10 Transfer of Floor Stock Data

Use

You can transfer floor stock data for certain goods movement types from an SAP ERP or SAP S/4HANA system to SAP Digital Manufacturing Cloud.

i Note

To use this functionality, you need to verify or update your integration configuration. For more information, see Updating Integration Configuration to Use Floor Stock Data [page 107].
In SAP S/4HANA or SAP ERP, go to SPRO Production Integration with Manufacturing Execution System Specify Production Storage Locations for an MES and maintain your storage location with:

Business system set as the business system for SAP Digital Manufacturing Cloud
Type set as Inventory management only by incoming transfer postings
The storage location configured as such only supports incoming goods movement 311. So if you still want to post goods movement 261, make sure that not all storage locations are configured this way.

Inbound integration
Inbound integration messages include:
- Floor Stock Receipt (goods movement type 311)
- Floor Stock Receipt with Reservation (goods movement type 261)

Inbound integration messages can create inventory IDs and can change the location of inventory.

Outbound integration
Outbound integration messages include:
- Floor Stock Return (goods movement type 312)
- Floor Stock Return for specific orders (goods movement type 262)
- Goods Issue for Scrapping (goods movement type 551)

Outbound integration messages can change the location of goods, consume goods and scrap goods in SAP ERP or SAP S/4HANA.

The following scenarios are supported:

Floor Stock Receipt (replenishment, goods movement type 311)
In your SAP ERP or SAP S/4HANA system, you can use the transaction MIGO to trigger goods movement from the central storage location to the production storage location.

The process for floor stock receipt without reservation (goods movement type 311) in SAP Digital Manufacturing Cloud assumes that the received goods are moved from a warehouse location to a production location, so that they can be used during the production process. These quantities are recorded and sent to SAP ERP or SAP S/4HANA as part of the production confirmation for consumption against the production order.

- When you post a transfer of unrestricted-use stock from a central (issuing) storage location to a floor stock (production) storage location in SAP ERP or SAP S/4HANA using the goods movement type 311 (transaction MIGO), the stock data is transferred from SAP ERP or SAP S/4HANA to SAP Digital Manufacturing Cloud by the INVCON03 IDoc.
- SAP ERP or SAP S/4HANA triggers the IDoc INVCON03 to integrate the floor stock to the production storage location (from Material Master or Production Order) in SAP Digital Manufacturing Cloud with Batch Number and Inventory ID created and Reserved Order Number attached to the new inventory. The inventory is ready for consumption without reservation in SAP Digital Manufacturing Cloud.
- A floor stock receipt is created for the specified components.

When yield / scrap collaboration is triggered, SAP Digital Manufacturing Cloud sends a confirmation to SAP ERP or SAP S/4HANA to report consumed components.

**Production Order-Specific Consumption (goods movement type 261)**
The process of floor stock receipt with reservation (goods movement type 261) in SAP DMC assumes that the goods are issued from a warehouse location (central storage location) to an order consumption.

In your SAP ERP or SAP S/4HANA system, you can use the transaction MIGO to trigger a goods issue to order/reservation from the central storage location.

Goods consumption happens when a material leaves the storage location. This consumption creates an inventory ID in SAP Digital Manufacturing Cloud. This inventory ID is consumed during assembly but this information is not reported to SAP ERP or SAP S/4HANA, because the consumption has already happened.

- When you post a goods issue from a central storage location to a production order in SAP ERP or SAP S/4HANA with the goods movement type 261 (transaction MIGO), the stock data is transferred through the INVCON03 IDoc for order pegging in SAP Digital Manufacturing Cloud.
- SAP ERP or SAP S/4HANA performs the goods issue to the respective production order.
- SAP ERP or SAP S/4HANA triggers the IDoc INVCON03 to integrate the floor stock to the production storage location (from Material Master or Production Order) in SAP Digital Manufacturing Cloud with Batch Number and Inventory ID created and Reserved Order Number attached to the new inventory.
- The inventory is ready for consumption only for the reserved order in SAP Digital Manufacturing Cloud.

Integration

- SAP ERP or SAP S/4HANA is the system of record for inventory management; SAP Digital Manufacturing Cloud is the system of record for floor stock management.
- A transfer posting in SAP ERP or SAP S/4HANA is used in the same way as a floor stock receipt in SAP Digital Manufacturing Cloud.
- For inventory ID records created in SAP Digital Manufacturing Cloud through the integration, the database field ERP_INVENTORY is equal to true.
- Floor storage location exists in both SAP ERP or SAP S/4HANA (LGORT) and SAP Digital Manufacturing Cloud (Storage Location); the Receiving Storage Location (UMLGO) exists only in SAP ERP.
- This function supports long material numbers (see Transfer of Long Material Number in the SAP Help Portal).

Prerequisites

SAP ERP or SAP S/4HANA

- You have created production storage locations for floor stock materials.
- You have set up ALE communication to create and transmit INVCON03 IDocs.
- If you use SAP ERP 6.05 (with activated business functions LOG_PP_MES_INT_01 and LOG_PP_MES_INT_02) or later, you have maintained integration of goods movements (see SAP Note 1555198).
- You have set up a filter for the goods movement type 261 and 311 (see Customizing for ALE Communicaton on the SAP Help Porta).
- You have created a BOM for the finished good material of the order.
You have created and configured data type for floor stock integration.

For materials to be received into floor stock and assembled, you have specified the following in the Manage Materials app:

- **Data to Collect on Assembly**: INV or INV_SFC

You have created a storage location matching SAP ERP or SAP S/4HANA Putaway Storage Location (see Mapping a Production Order [page 117]).

For the production order-specific consumption scenario, you have created or imported shop order data so that components can be pegged (see Production Order Integration [page 71]).

You have defined a numbering pattern for the number type floor stock receipt (see Configuring a Production Order with Serial Numbers [page 75]).

For the outbound integration with Inventory Management (IM), you have mapped the following collaboration links to respective directives depending on your requirements in the Manage Collaboration Links app.

- The link COLLABORATION_ERP_INV_CLEAR_RESERVATION is mapped to the directive ERP_INVENTORY_CLEAR_RESERVATION.
- The link COLLABORATION_ERP_SCRAP_CONFIRMATION is mapped to the directive ERP_SCRAP_CONFIRMATION.
- The link COLLABORATION_ERP_YIELD_CONFIRMATION is mapped to the directive ERP_YIELD_CONFIRMATION.
- The link COLLABORATION_SFC_COMPONENT_ADD is mapped to the directive ERP_COMPONENT_ADD.

If you have enabled EWM integration, configure the following collaboration links.

- The link EWM_COLLABORATION_COMPONENT_ADD is mapped to the directive EWM_COMPONENT_ADD.
- The link EWM_COLLABORATION_CONTAINER_CLOSE is mapped to the directive EWM_CONTAINER_CLOSE_CONFIRMATION.
- The link EWM_COLLABORATION_SFC_DISPOSITION is mapped to the directive EWM_SFC_DISPOSITION.
- The link EWM_COLLABORATION_YIELD_CONFIRMATION is mapped to the directive EWM_GOODS_ISSUE_POST.

### 3.2.2.2.10.1 Configuring Floor Stocks

This section describes how to transfer floor stocks from SAP ERP or SAP S/4HANA to SAP Digital Manufacturing Cloud for execution to create corresponding floor stock records in the Manage Floor Stocks app.

**Note**

You can transfer floor stocks through goods movement types 311 and 261.

**Prerequisites**

**SAP ERP or SAP S/4HANA**

- You have created floor stock materials you want to transfer.
• You have created central storage locations and production storage locations for the floor stock materials.
• You have set up ALE communication to create and transmit INVCON03 IDocs.
• You have defined the DRF Replication Model to replicate INVCON03 IDocs. For more information, see Set Up Data Replication Framework (DRF) [page 36].

SAP Digital Manufacturing Cloud

• The floor stock materials are already downloaded from SAP ERP or SAP S/4HANA to SAP Digital Manufacturing Cloud.
• You have created a production storage location matching ERP Putaway Storage Location (see Mapping a Production Order [page 117]).
• The collaboration link COLLABORATION_BATCH_CHARACTERISTICS is mapped to the directive BATCH_CHARACTERISTICS in the Manage Collaboration Links app.

Procedure

There are various methods to trigger the transfer of floor stocks. The following is one of the options.

1. Execute the transaction code MIGO to call up the Transfer Posting screen.
2. To transfer floor stocks for general usage, select Transfer Posting with goods movement type 311. If you want to transfer floor stocks reserved for a specific order, select Goods Issue and Order with goods movement type 261.
3. Check and post the goods movement.
4. Verify the results in the Manage Floor Stocks app or the Monitor Integration Messages app in SAP Digital Manufacturing Cloud.

3.2.2.2.10.2 Updating Integration Configuration to Use Floor Stock Data

If you want to use floor stock integration functionality in SAP Digital Manufacturing Cloud, you need to update some settings in your configuration integration, as shown here.

The SaaS tenant of your system must generate a new service instance and key for Digital Manufacturing Cloud Services.

These are required for authentication in SAP Cloud Integration. You need to manually transfer this new service instance and key as described here.

Prerequisites

• You have set up the SAP Cloud Connector.
• You have carried out the necessary steps in Integration with SAP ERP or SAP S/4HANA [page 24].
**Steps**

1. Go to the SaaS tenant of your system and generate a new service instance and key for digital-manufacturing-services-**. Note down the `clientid` and `clientsecret` under the `uaa` tag.
2. Configure SAP Cloud Integration to connect with SAP Digital Manufacturing Cloud for execution.
   1. Go to your SAP Cloud Integration tenant. In the side menu bar, choose *Operations View* and then choose *Security Material* in *Manage Security* group.
   2. Add *User Credentials* with the *Name*: CF_AUTH, the *User*: `clientid`, and the *Password*: `clientsecret`.
3. Assign the collaboration directive `ERP_INV_CLEAR_RESERVATION` to the collaboration link `COLLABORATION_ERP_INV_CLEAR_RESERVATION` for the inventory Return and Scrap activity.

**Result**

You can now use the floor stock functionality as described in this chapter.

**Related Information**

*Setting Up the Cloud Connector [page 13]*

**3.2.2.2.10.3 Transfer of Floor Stock Return and Scrap Data**

**Use**

This function lets you transfer floor stock return and scrap data from SAP Digital Manufacturing Cloud to SAP ERP.

**i Note**

To use this functionality, you need to verify or update your integration configuration. For more information, see *Updating Integration Configuration to Use Floor Stock Data [page 107]*.

1. In SAP Digital Manufacturing Cloud, you can trigger the floor stock return to a central storage location and scrap using a reason code.
2. The collaboration `COLLABORATION_ERP_INV_CLEAR_RESERVATION (ERP_INV_CLEAR_RESERVATION)` is triggered in SAP Digital Manufacturing Cloud. This initiates the data synchronization to the ERP system.
3. In the ERP system, the floor stock is increased in the central storage location according to the return request. The inventory in the production storage location is decreased according to the return and scrap request.
The following scenarios are supported:

**Production Order-Independent Floor Stock (311) Return (312) and Scrap (551)**

The process below describes the flow of floor stock return and scrap in SAP Digital Manufacturing Cloud which will be synchronized to ERP for production order-independent floor stock.

- The components are returned to the central storage location.
  SAP ERP posts a goods movement of the type 312, the reversal of a one-step transfer posting.
- The components are scrapped.
  SAP ERP posts a scrapping movement of the type 551.

**Production Order-Specific Floor Stock (261) Return (262) and Scrap (551)**

The illustration shows the flow of floor stock return and scrap in SAP Digital Manufacturing Cloud, which is synchronized to ERP for production order-independent floor stock.
The production order components are returned to central storage location. SAP ERP reverses a goods issue of the production order components with movement type 262.

The components are scrapped. SAP ERP scraps the Production shop order components.

SAP ERP reverses a goods issue of the production order components with movement type 262, then posts a scrapping movement (type 551).

**Integration**

- SAP ERP is the system of record for inventory management; SAP Digital Manufacturing Cloud is the system of record for floor stock management.
- SAP Cloud Integration is used as the connector between the SAP Digital Manufacturing Cloud Manage Floor Stock app and the SAP ERP floor stock control process for returning inventory and scrap.
Prerequisites

SAP Digital Manufacturing Cloud
- You have received floor stock data from SAP ERP.
- You have verified the pre-defined reason codes.

SAP ERP
You have created a cost center for reporting material scrap quantities.

Activities

When you decrease the value of the Qty on Hand field for an inventory ID, enter a reason code and choose Save in the Manage Floor Stock app in SAP Digital Manufacturing Cloud, SAP Cloud Integration sends a message to SAP ERP to post the corresponding goods movements.

If the reason code has the prefix RTN-, the component quantity is returned to SAP ERP Central Stores. If the reason code has the prefix SCR-, the component quantity is scrapped.

3.2.2.3 Field Mapping for Integration to SAP ERP or SAP S/4HANA

This section describes what fields in an SAP ERP or SAP S/4HANA system are mapped to what fields in SAP Digital Manufacturing Cloud for execution.

3.2.2.3.1 Mapping a Material

You transfer material data from SAP ERP to SAP Digital Manufacturing Cloud for execution using the IDoc MATMAS03.

This table contains field names in SAP ERP and their corresponding field names in SAP Digital Manufacturing Cloud for execution:

<table>
<thead>
<tr>
<th>SAP ERP</th>
<th>SAP Digital Manufacturing Cloud for Execution</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plant (WERKS)</td>
<td>Plant</td>
<td></td>
</tr>
<tr>
<td>Material Number (MATNR LONG)</td>
<td>Material</td>
<td></td>
</tr>
</tbody>
</table>
### SAP ERP 
SAP Digital Manufacturing Cloud for Execution 

<table>
<thead>
<tr>
<th>SAP ERP</th>
<th>SAP Digital Manufacturing Cloud for Execution</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Material Description</strong> (MAKTX)</td>
<td><strong>Description</strong></td>
<td>In SAP ERP, you can define the <em>Material Description</em> in several languages.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>i Note</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td>You can only map material descriptions in languages supported by SAP Digital Manufacturing Cloud. Refer to note <a href="#">2722461</a> for an overview of supported languages. If you require a language that isn’t supported, you can use mediated integration to transform your message content.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Unit of Measure</strong> (MEINS)</th>
<th><strong>Unit of Measure</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Procurement Type</strong> (BESKZ)</td>
<td><strong>Material Type</strong></td>
</tr>
<tr>
<td>![ ] M</td>
<td><strong>Manufactured:</strong> M</td>
</tr>
<tr>
<td>![ ] P</td>
<td><strong>Purchased:</strong> P</td>
</tr>
<tr>
<td>![ ] B</td>
<td><strong>Manufactured / Purchased:</strong> B</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Batch Management Requirement Indicator</strong> (XCHPF)</th>
<th><strong>Increment Batch Number</strong></th>
<th>If equal to X, set to <strong>Per Order</strong>, otherwise set to None.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th><strong>Backflush</strong> (RGEKZ)</th>
<th><strong>Backflushing in ERP</strong></th>
<th>If selected, the backflush indicator (RGEKZ) value is 1.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th><strong>Storage Location</strong> (LGPRO)</th>
<th><strong>ERP Production Storage Location or ERP Putaway Storage Location</strong></th>
<th>The length of ERP Production Storage Location value must be less than or equal to 4.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>If the BESKZ value equals E, the LGPRO value is stored in the ERP Putaway Storage Location field. If the BESKZ value isn’t equal to E, the LGPRO value is stored in the ERP Production Storage Location field.</td>
<td></td>
</tr>
</tbody>
</table>

---

SAP Digital Manufacturing Cloud Integration Guide
Manufacturing Execution Integration
### 3.2.2.3.2 Mapping a Bill of Material (BOM)

Data is transferred from SAP ERP to SAP Digital Manufacturing Cloud for execution using the `BOMMAT05` IDoc. This table contains field names in SAP ERP and their corresponding field names in SAP Digital Manufacturing Cloud for execution:

<table>
<thead>
<tr>
<th>SAP ERP</th>
<th>SAP Digital Manufacturing Cloud for Execution</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Plant (WERKS)</em></td>
<td><em>Plant</em></td>
<td></td>
</tr>
<tr>
<td><em>Material Number (MATNR or MATNR_EXTERNAL), BOM Usage (STLAN), Alternative BOM (STLAL)</em></td>
<td><em>BOM</em></td>
<td><em>Material Number (MATNR) + &quot;-&quot; + BOM Usage (STLAN) + &quot;-&quot; + Alternative BOM (STLAL)</em></td>
</tr>
<tr>
<td><em>Bill of material ZTEXT or MATNR, MATNR_LONG or MATNR_EXTERNAL</em></td>
<td><em>Description</em></td>
<td></td>
</tr>
</tbody>
</table>
| *Status* | | *SAP ERP BOM status is mapped to SAP ME BOM status as follows:*
| | | *● 02 Inactive - New*
| | | *● else Active - Releasable* |
| | | *Effectively Control* | *R No logic in SAP Digital Manufacturing Cloud for execution yet.* |
| | | *Current Version* | *Selected* |
| *Bill of material (STLNR)* | *ERP BOM* |                                                                         |
| *BOM Component (IDNRK)* | *Component* | *Saves the component as Primary.*
| | | *No BOM alternates component support in SAP Digital Manufacturing Cloud for execution yet.* |
| *BOM Item Number (POSNR)* | *Sequence* |                                                                         |
| | | *BOM Component Type* | *N* |
| | | *Test Part* | *Deselected* |
| | | *Normalized Quantity for component that is Component Quantity / Base Quantity (MENGE_C / BMENG_C)* |                                                                         |
| | | *Installation Point for Subitem (EBORT)* | *Ref Des* |
| | | *Ref Des Sequence* | *10* |
### 3.2.2.3.3 Mapping Alternate BOM Components

BOM components that belong to the same alternate group in SAP S/4HANA and ERP are mapped as alternate components for each other in SAP Digital Manufacturing Cloud for execution.

#### Master BOM Component

**ERP / SAP S/4HANA**

<table>
<thead>
<tr>
<th>DME Field</th>
<th>Default Value</th>
<th>SAP S/4HANA Field</th>
</tr>
</thead>
<tbody>
<tr>
<td>alternativeItemGroup</td>
<td></td>
<td>ALPGR</td>
</tr>
<tr>
<td>ERP Alternate Item Group</td>
<td></td>
<td></td>
</tr>
<tr>
<td>alternates.enabled</td>
<td>TRUE</td>
<td></td>
</tr>
<tr>
<td>Alternates Enabled</td>
<td></td>
<td></td>
</tr>
<tr>
<td>alternates.priority</td>
<td>ALPRF</td>
<td></td>
</tr>
<tr>
<td>Alternates Priority</td>
<td></td>
<td></td>
</tr>
<tr>
<td>alternates.material</td>
<td>IDNRK</td>
<td></td>
</tr>
<tr>
<td>Alternate Component</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Order BOM

**ERP / SAP S/4HANA**

<table>
<thead>
<tr>
<th>DME Field</th>
<th>Default Value</th>
<th>SAP S/4HANA Cloud Field</th>
</tr>
</thead>
<tbody>
<tr>
<td>alternativeItemGroup</td>
<td></td>
<td>ALPGR</td>
</tr>
<tr>
<td>ERP Alternate Item Group</td>
<td></td>
<td></td>
</tr>
<tr>
<td>alternates.enabled</td>
<td>TRUE</td>
<td></td>
</tr>
<tr>
<td>Alternates Enabled</td>
<td></td>
<td></td>
</tr>
<tr>
<td>alternates.priority</td>
<td>ALPRF</td>
<td></td>
</tr>
<tr>
<td>Alternates Priority</td>
<td></td>
<td></td>
</tr>
<tr>
<td>alternates.material</td>
<td>MATNR</td>
<td></td>
</tr>
<tr>
<td>Alternate Component</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### 3.2.2.3.4 Mapping a Routing with Operation Activities

Data is transferred from SAP ERP to SAP Digital Manufacturing Cloud for execution using the LOIROU04 IDoc. LOIROU04 supports long material numbers (LMN) and mapping of work instructions. This table contains field names in SAP ERP and their corresponding field names in SAP Digital Manufacturing Cloud for execution:

<table>
<thead>
<tr>
<th>SAP ERP</th>
<th>SAP Digital Manufacturing Cloud for Execution</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Plant</strong> (WERKS)</td>
<td><strong>Plant</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Key for Task List Group</strong> (PLNRR); <strong>Group Counter</strong> (PLNAL) or /E1AFREF/ MES_ROUTINGID</td>
<td><strong>Routing</strong></td>
<td>PLNRR + &quot;-&quot; + PLNAL /E1AFREF/MES_ROUTINGID if the routing was created in SAP ME and then sent to SAP ERP.</td>
</tr>
<tr>
<td><strong>Version</strong></td>
<td></td>
<td>ERPO01 for a new record and increments as necessary for updated records.</td>
</tr>
<tr>
<td><strong>Routing Type</strong></td>
<td><strong>U</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Short Description</strong> (KTEXT)</td>
<td><strong>Description</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Status</strong></td>
<td><strong>Releasable</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Effectivity Control</strong></td>
<td></td>
<td>No logic in SAP Digital Manufacturing Cloud for execution yet.</td>
</tr>
<tr>
<td><strong>Current Version</strong></td>
<td><strong>Selected</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Key for Task List Group</strong> (PLNRR); <strong>Group Counter</strong> (PLNAL)</td>
<td><strong>Entry Routing</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Entry Routing Type</strong></td>
<td><strong>U</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Entry Routing Step ID</strong></td>
<td><strong>10</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Key for Task List Group</strong> (PLNRR); <strong>Group Counter</strong> (PLNAL); <strong>Sequence</strong> (PLNFL); <strong>Operation</strong> (VORNR) or ME_OPERATION_ID</td>
<td><strong>Operation Activity</strong></td>
<td>PLNRR + &quot;-&quot; + PLNAL + &quot;-&quot; + PLNFL + &quot;-&quot; + VORNR or ME_OPERATION_ID</td>
</tr>
<tr>
<td><strong>Operation</strong> (VORNR)</td>
<td><strong>Reporting Step</strong></td>
<td>Operation step number in ERP</td>
</tr>
<tr>
<td><strong>Rework</strong></td>
<td></td>
<td>Deselected</td>
</tr>
<tr>
<td><strong>Sequence</strong> (FLAGAT)</td>
<td><strong>Data field: ERP_SEQUENCE</strong></td>
<td>0. Only a zero sequence routing is supported.</td>
</tr>
<tr>
<td>SAP ERP</td>
<td>SAP Digital Manufacturing Cloud for Execution</td>
<td>Comment</td>
</tr>
<tr>
<td>---------------------------------------------</td>
<td>---------------------------------------------</td>
<td>----------------------------------------------</td>
</tr>
<tr>
<td><strong>Key for Task List Group</strong> (PLNNR), <strong>Group Counter</strong> (PNAL), <strong>Sequence</strong> (PLNFL), <strong>Operation</strong> (VORNR) or ME_OPERATION_ID</td>
<td><strong>Operation Activity</strong></td>
<td><strong>Note</strong> Operation activity master name records can be created from the integration as specified here. They can also be created manually in the Manage Operation Activities app.</td>
</tr>
<tr>
<td><strong>Operation Activity Version</strong></td>
<td>ERP001 or ME_REVISION</td>
<td></td>
</tr>
<tr>
<td><strong>Operation Short Text</strong> (LTXA1)</td>
<td><strong>Operation Activity Description</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Maximum Loop Count</strong></td>
<td>0</td>
<td></td>
</tr>
<tr>
<td><strong>Operation Activity Master Type</strong></td>
<td>N (Normal)</td>
<td></td>
</tr>
</tbody>
</table>

Fields relevant for SAP ERP EhPOS and above:

<table>
<thead>
<tr>
<th>SAP ERP</th>
<th>SAP Digital Manufacturing Cloud for Execution</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Operation Short Text</strong> (LTXA1)</td>
<td><strong>Description</strong></td>
<td>Routing step description</td>
</tr>
<tr>
<td><strong>Operation Short Text</strong> (LTXA1)</td>
<td><strong>Description</strong></td>
<td>Operation activity description</td>
</tr>
<tr>
<td><strong>Document number</strong> (DOKNR)</td>
<td><strong>Work Instruction</strong></td>
<td>DOKNR + '-' + DOKAR + '-' + DOKTL + '-' + ORIGINAL</td>
</tr>
<tr>
<td><strong>Document Type</strong> (DOKAR)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Document Part</strong> (DOKTL)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Application number</strong> (ORIGINAL)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Document Version</strong> (DOKVR)</td>
<td><strong>Version</strong></td>
<td></td>
</tr>
</tbody>
</table>

### 3.2.2.3.5 Field Mapping for a Standard Value Key (SVK)

The fields created in SAP S/4HANA On-Premise and ERP correspond to certain fields of SAP Digital Manufacturing Cloud for execution.

**Work Center Download (LOIWCS): Standard Value Key Mapping for an SV Group**

<table>
<thead>
<tr>
<th>SAP Digital Manufacturing Cloud for Execution Field</th>
<th>SAP S/4HANA On-Premise</th>
</tr>
</thead>
<tbody>
<tr>
<td>.plant</td>
<td>WERKS</td>
</tr>
</tbody>
</table>
You transfer production order data from SAP ERP to SAP Digital Manufacturing Cloud for execution using the IDoc LOIPRO05 (used with SAP ERP EhP 05 and above).

This table contains field names in SAP ERP and the corresponding field names in SAP Digital Manufacturing Cloud for execution:

<table>
<thead>
<tr>
<th>SAP ERP</th>
<th>SAP Digital Manufacturing Cloud for execution</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plant (WERKS)</td>
<td>Plant</td>
<td></td>
</tr>
<tr>
<td>Order Number (AUFNR)</td>
<td>Production Order</td>
<td></td>
</tr>
<tr>
<td>SAP ERP</td>
<td>SAP Digital Manufacturing Cloud for execution</td>
<td>Comment</td>
</tr>
<tr>
<td>---------</td>
<td>--------------------------------------------</td>
<td>---------</td>
</tr>
<tr>
<td><strong>Status (STAT)</strong></td>
<td>Status</td>
<td>Last STAT segment in E1JSTKL defaults to Releasable unless STAT equals:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>If so, the status is set to <strong>Closed</strong>.</td>
</tr>
<tr>
<td><strong>Priority</strong></td>
<td>P</td>
<td>500</td>
</tr>
<tr>
<td><strong>Material Number (MATNR or MATNR_EXTERNAL or MATNR_LONG)</strong></td>
<td>Planned Material</td>
<td></td>
</tr>
<tr>
<td><strong>Base Quantity (BMENGE)</strong></td>
<td>Build Qty</td>
<td></td>
</tr>
<tr>
<td><strong>Base Quantity (BMENGE)</strong></td>
<td>Ordered Qty</td>
<td></td>
</tr>
<tr>
<td><strong>Planned Start Date (GSTRP), Planned Start Time (GSUZP)</strong></td>
<td>Planned Start</td>
<td>GSTRP + GSUZP</td>
</tr>
<tr>
<td></td>
<td></td>
<td>If GSUZP left blank, defaults to 00:00:01</td>
</tr>
<tr>
<td><strong>Planned Finish Date (GLTRP), Planned Finish Time (GLUZP)</strong></td>
<td>Planned End</td>
<td>GLTRP + GLUZP</td>
</tr>
<tr>
<td></td>
<td></td>
<td>If GLUZP left blank, defaults to 00:00:01</td>
</tr>
<tr>
<td><strong>Scheduled Start Date (GSTRS), Scheduled Start Time (GSUZS)</strong></td>
<td>Scheduled Start</td>
<td>GSTRS + GSUZS</td>
</tr>
<tr>
<td></td>
<td></td>
<td>If GSUZS left blank, defaults to 00:00:01</td>
</tr>
<tr>
<td><strong>Scheduled Finish Date (GLTRS), Scheduled Finish Time (GLUZS)</strong></td>
<td>Scheduled End</td>
<td>GLTRS + GLUZS</td>
</tr>
<tr>
<td></td>
<td></td>
<td>If GLUZS left blank, defaults to 23:59:59</td>
</tr>
<tr>
<td><strong>Sold-To Party Number (KUNAG)</strong></td>
<td>Customer</td>
<td></td>
</tr>
<tr>
<td><strong>Sold-To Party Name (NAME1)</strong></td>
<td>Customer name</td>
<td></td>
</tr>
<tr>
<td><strong>Base Unit of Measure (BMEINS)</strong></td>
<td>Custom data field: ERP_UOM</td>
<td>This unit is converted in the IDoc in the ISO unit of measure defined in SAP ERP Customizing.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Database table column: SHOP_ORDER.ERP_ORDER</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Set to True by default (not present in the GUI)</td>
</tr>
<tr>
<td><strong>Storage Location (LGORT)</strong></td>
<td>ERP Putaway Storage Location</td>
<td></td>
</tr>
<tr>
<td><strong>Batch (CHARG)</strong></td>
<td>Batch Number</td>
<td></td>
</tr>
<tr>
<td><strong>Order Number (AUFNR)</strong></td>
<td>Planned BOM</td>
<td>Same as shop order number</td>
</tr>
<tr>
<td>SAP ERP</td>
<td>SAP Digital Manufacturing Cloud for execution</td>
<td>Comment</td>
</tr>
<tr>
<td>----------</td>
<td>---------------------------------------------</td>
<td>---------</td>
</tr>
<tr>
<td>Bill of Material (STLNR)</td>
<td>ERP_BOM</td>
<td></td>
</tr>
<tr>
<td>BOM Description</td>
<td>Material Number (MATNR or MATNR_EXTERNAL or MATNR_LONG)</td>
<td></td>
</tr>
</tbody>
</table>

If there is an alternate group for BOM components, then the component with Priority 1 must be passed as a BOM component in SAP ME, regardless of Usage Prob. The quantity of this component must be calculated as NOMNG divided by the order quantity (BMENGE). All other components of this alternate group must be passed as alternate components of the BOM component in SAP ME, regardless of Usage Prob.

In all other cases, the quantity is calculated as component quantity (BDMNG) divided by order quantity (BMENGE).

<p>| BOM Component Material Number (MATNR or MATNR_EXTERNAL or MATNR_LONG) | BOM Component | Only ERP components that populate the MATNR field are supported. |
| Key for Task List Group (PLNNR), Group Counter (PLNAL), Sequence (PLNFL), Operation (VORNR) or ME_OPERATION_ID | BOM Component Assembly Operation (VORNR) or ME_OPERATION_ID | Key for Task List Group (PLNNR) + &quot;.&quot; + Group Counter (PLNAL) + &quot;.&quot; + Sequence (PLNFL) + &quot;.&quot; + Operation (VORNR) or ME_OPERATION_ID |
| BOM Component Assembly Operation Version | Version of the assembly operation; defaults to # (not present in the GUI) or ME_REVISION |
| Routing Effectivity Control | R | No logic in SAP Digital Manufacturing Cloud for execution yet. |
| Material Number (MATNR or MATNR_EXTERNAL or MATNR_LONG) | Routing Description |
| Operation (VORNR) | Reporting Step |</p>
<table>
<thead>
<tr>
<th>SAP ERP</th>
<th>SAP Digital Manufacturing Cloud for execution</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Key for Task List Group</strong> (PLNNR), <strong>Group Counter</strong> (PLNAL), <strong>Sequence</strong> (PLNFL), <strong>Operation</strong> (VORNR) or <strong>ME_OPERATION_ID</strong></td>
<td><strong>Operation</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Operation Version</strong></td>
<td>ERP001 or <strong>ME_REVISION</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Operation Short Text</strong> (LTXA1)</td>
<td><strong>Operation Description</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Maximum Loop Count</strong></td>
<td>0</td>
<td></td>
</tr>
<tr>
<td><strong>Operation Type</strong></td>
<td>N (Normal)</td>
<td></td>
</tr>
<tr>
<td><strong>Sequence</strong> (RSPOS)</td>
<td><strong>Data field: SEQUENCE</strong></td>
<td>Sequence is calculated as RSPOS*10</td>
</tr>
<tr>
<td><strong>Data field: IS_LAST_REPORTING_STEP</strong></td>
<td>If selected, this is the last ERP routing step.</td>
<td></td>
</tr>
<tr>
<td><strong>Material Number-BOM Explosion Number</strong></td>
<td><strong>SFC Number</strong> (Sfc)</td>
<td></td>
</tr>
<tr>
<td>(MATNR- E1AFKOL/E1AFPOL/ E1AFSER/SENR)</td>
<td><strong>BOM Explosion Number</strong> (E1AFKOL/ E1AFPOL/ E1AFSER/SENR)</td>
<td></td>
</tr>
<tr>
<td><strong>Serial Number</strong> (SerialNumber)</td>
<td><strong>Operation Short Text</strong> (LTXA1)</td>
<td><strong>Description</strong> Description of Routing Step</td>
</tr>
<tr>
<td><strong>Operation Short Text</strong> (LTXA1)</td>
<td><strong>Description</strong> Operation description</td>
<td></td>
</tr>
<tr>
<td><strong>Order Schedule List</strong></td>
<td><strong>KAPNAME</strong> Resource</td>
<td></td>
</tr>
<tr>
<td><strong>Capacity ID</strong> (/E1AFKOL/E1AFFLL/ E1AFVOL/E1KBEDL/KAPID)</td>
<td><strong>erpInternalID of resource</strong> SAP ME database field</td>
<td></td>
</tr>
<tr>
<td><strong>Split Number</strong> (SPLIT)</td>
<td><strong>Split ID</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Operation Quantity</strong> (MGVRG)</td>
<td><strong>Planned Quantity</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Start / Date</strong> (FSTAD)</td>
<td><strong>Start Time</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Start / Time</strong> (FSTAU)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Finish / Date</strong> (FENDD)</td>
<td><strong>End Time</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Finish / Time</strong> (FEDNU)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SAP ERP</td>
<td>SAP Digital Manufacturing Cloud for execution</td>
<td>Comment</td>
</tr>
<tr>
<td>---------</td>
<td>---------------------------------------------</td>
<td>---------</td>
</tr>
<tr>
<td><strong>Earliest Setup Start / Date</strong> (FSAVD)</td>
<td><strong>Earliest Setup Start Time</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Earliest Setup Start / Time</strong> (FSAVZ)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Latest Setup Start / Date</strong> (FSAVD)</td>
<td><strong>Latest Setup Start Time</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Latest Setup Start / Time</strong> (FSAVZ)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Earliest Processing Start / Date</strong> (FSSBD)</td>
<td><strong>Earliest Processing Start Time</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Earliest Processing Start / Time</strong> (FSSBZ)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Latest Processing Start / Date</strong> (FSSBD)</td>
<td><strong>Latest Processing Start Time</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Latest Processing Start / Time</strong> (FSSBZ)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Earliest Teardown Start / Date</strong> (FSSAD)</td>
<td><strong>Earliest Teardown Start Time</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Earliest Teardown Start / Time</strong> (FSSAZ)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Latest Teardown Start / Date</strong> (FSSAD)</td>
<td><strong>Latest Teardown Start Time</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Latest Teardown Start / Time</strong> (FSSAZ)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Earliest Teardown Finish / Date</strong> (SSEVD)</td>
<td><strong>Earliest Teardown End Time</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Earliest Teardown Finish / Time</strong> (SSEVZ)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Latest Teardown Finish / Date</strong> (SSEVD)</td>
<td><strong>Latest Teardown End Time</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Latest Teardown Finish / Time</strong> (SSEVZ)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Earliest Waiting Finish / Date</strong> (FSSLD)</td>
<td><strong>Earliest Waiting End Time</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Earliest Waiting Finish / Time</strong> (FSSLZ)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Latest Waiting Finish / Date</strong> (FSSLD)</td>
<td><strong>Latest Waiting End Time</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Latest Waiting Finish / Time</strong> (FSSLZ)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Plan Setup Time</strong> (RUSET)</td>
<td><strong>Plan Setup Time</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Plan Processing Time</strong> (BEARZ)</td>
<td><strong>Plan Processing Time</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Plan Teardown Time</strong> (ABRUE)</td>
<td><strong>Plan Teardown Time</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Setup Time UoM</strong> (RSTZE)</td>
<td><strong>Setup Time UoM</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Processing Time UoM</strong> (BEAZE)</td>
<td><strong>Processing Time UoM</strong></td>
<td></td>
</tr>
</tbody>
</table>
3.2.2.3.7 Mapping a Production Yield Confirmation

(yieldConfirmationRequest or CorrelatedYieldConfirmationRequest)

Data is transferred from SAP Digital Manufacturing Cloud for execution to SAP ERP using the BAPI_PRODORDCONF_CREATE_TT or CO_MES_PRODORDCONF_CREATE_TT (for SAP ERP 6.0 with EHP 5 or higher that uses Activated MES Integration) BAPI.

This table contains field names in SAP ERP and their corresponding field names in SAP Digital Manufacturing Cloud for execution:

<table>
<thead>
<tr>
<th>SAP ERP</th>
<th>SAP Digital Manufacturing Cloud for Execution</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SFC Number</strong> (SFC_BO)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Plant</strong> (PLANT)</td>
<td><strong>Plant</strong> (PLANT)</td>
<td></td>
</tr>
<tr>
<td>SAP ERP</td>
<td>SAP Digital Manufacturing Cloud for Execution</td>
<td>Comment</td>
</tr>
<tr>
<td>---------------------------------------------</td>
<td>----------------------------------------------</td>
<td>-------------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>Movement Type</strong> (MOVE_TYPE)</td>
<td></td>
<td>101 for parent material receipt, 261 for component confirmation</td>
</tr>
<tr>
<td><strong>Order Number</strong> (ORDERID)</td>
<td>Order</td>
<td>The order is determined from SFC_BO</td>
</tr>
<tr>
<td><strong>Yield to Be Confirmed</strong> (YIELD)</td>
<td>Quantity</td>
<td>SFC quantity / quantity completed (normally 1, except for a non-serialized SFC number)</td>
</tr>
<tr>
<td><strong>Activity Number</strong> (OPERATION)</td>
<td>Custom data field: REPORTING_STEP</td>
<td>SAP ERP operation number related to the process sequence number (routing reporting step)</td>
</tr>
<tr>
<td><strong>Batch Number</strong> (BATCH)</td>
<td><strong>Batch Number</strong></td>
<td></td>
</tr>
<tr>
<td>FIN_CONF</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>CLEAR_RES</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>CONF QUAN UNIT ISO</td>
<td>unitOfMeasure</td>
<td></td>
</tr>
<tr>
<td><strong>Capacity Category</strong> (CAPA_CATEGORY)</td>
<td>erpCapacityCategory</td>
<td></td>
</tr>
<tr>
<td><strong>Split Number</strong> (SPLIT)</td>
<td><strong>Split ID</strong> (splitId)</td>
<td></td>
</tr>
<tr>
<td>IV PROPOSE_BACKFLUSH</td>
<td>X when components parameter in Collaboration Directive is set to onlyNonBackflushed</td>
<td></td>
</tr>
<tr>
<td>IV 2ND TIME CONFIRMATION (only for CO_MES_PRODORCONF_CREATE_TT)</td>
<td>X for repeated operation confirmation</td>
<td></td>
</tr>
<tr>
<td>GOODSMOVEMENTS</td>
<td><strong>segment</strong></td>
<td></td>
</tr>
<tr>
<td>PLANT</td>
<td><strong>Plant</strong></td>
<td></td>
</tr>
<tr>
<td>MOVE_TYPE</td>
<td></td>
<td>The type of goods movement: 261 for Goods Issue; 101 for Goods Receipt</td>
</tr>
<tr>
<td>MATERIAL or MATERIAL_EXTERNAL or MATERIAL_LONG</td>
<td><strong>Material</strong></td>
<td></td>
</tr>
<tr>
<td>STGE LOC</td>
<td>storageLocation</td>
<td>Floor Stock Storage Location available for the selected inventory ID. If not available, the value is defined in the ERP Production Storage Location field in Material Maintenance.</td>
</tr>
</tbody>
</table>
3.2.2.3.8 Mapping a Production Scrap Confirmation

Data is transferred from SAP Digital Manufacturing Cloud for execution to SAP ERP using the BAPI_PRODORDCONF_CREATE_TT or CO_MES_PRODORDCONF_CREATE_TT BAPI.

This table contains field names in SAP ERP and their corresponding field names in SAP Digital Manufacturing Cloud for execution:

<table>
<thead>
<tr>
<th>SAP ERP</th>
<th>SAP Digital Manufacturing Cloud for Execution</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>BATCH</td>
<td>batchNumber</td>
<td></td>
</tr>
<tr>
<td>ENTRY_QNT</td>
<td>Quantity</td>
<td></td>
</tr>
<tr>
<td>ENTRY_UOM_ISO</td>
<td>unitOfMeasure</td>
<td></td>
</tr>
<tr>
<td>ORDERID</td>
<td>orderNumber</td>
<td></td>
</tr>
</tbody>
</table>

**Movement Indicator (MVT_IND)**

F for the movement type 101

**IT_GOODSMVT_SERIALNUMBER segment** (relevant for SAP ECC EhP05 and above)

<table>
<thead>
<tr>
<th>Serial Number (SERIALNO)</th>
<th>Serial Number (SERIALNO)</th>
<th>Serial number (or SFC number) of the main assembly is sent from the last reporting step (the movement type 101).</th>
</tr>
</thead>
</table>

SAP Digital Manufacturing Cloud Integration Guide
Manufacturing Execution Integration
<table>
<thead>
<tr>
<th>SAP ERP</th>
<th>SAP Digital Manufacturing Cloud for Execution</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>FIN_CONF</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>CLEAR_RES</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>CONF_QUAN_UNIT_ISO</td>
<td>unitOfMeasure</td>
<td></td>
</tr>
<tr>
<td><strong>Capacity Category</strong> (CAPA_CATEGORY)</td>
<td>erpCapacityCategory</td>
<td></td>
</tr>
<tr>
<td><strong>Split Number</strong> (SPLIT)</td>
<td><strong>Split ID</strong> (splitId)</td>
<td></td>
</tr>
<tr>
<td><strong>Component section</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MOVE_TYPE</td>
<td>The type of goods movement; 261 for <strong>Goods Issue</strong></td>
<td></td>
</tr>
<tr>
<td>MATERIAL or MATERIAL_EXTERNAL or MATERIAL_LONG</td>
<td>item</td>
<td></td>
</tr>
<tr>
<td>PLANT</td>
<td>Plant</td>
<td></td>
</tr>
<tr>
<td>STGE_LOC</td>
<td>Storage Location</td>
<td></td>
</tr>
<tr>
<td>BATCH</td>
<td>batchNumber</td>
<td></td>
</tr>
<tr>
<td>ENTRY_QNT</td>
<td>Quantity</td>
<td></td>
</tr>
<tr>
<td>CO_MES_PRODORDCONF_CREATE_TT</td>
<td>BAPI name is changed from BAPI_PRODORDCONF_CREATE_TT to CO_MES_PRODORDCONF_CREATE_TT</td>
<td></td>
</tr>
<tr>
<td>CONF_ID</td>
<td>messageID</td>
<td></td>
</tr>
<tr>
<td>ACTIVITY</td>
<td>reportingStep</td>
<td></td>
</tr>
</tbody>
</table>
### 3.2.2.3.9 Mapping an Independent Components Consumption

Data is transferred from SAP Digital Manufacturing Cloud for execution to SAP ERP using the MB_MES_GOODSMVT_CREATE BAPI.

This table contains field names in SAP ERP and their corresponding field names in SAP Digital Manufacturing Cloud for execution:

<table>
<thead>
<tr>
<th>SAP ERP</th>
<th>SAP Digital Manufacturing Cloud for Execution</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>DETERMINE_RESERVATIONS</td>
<td></td>
<td>Always set to X</td>
</tr>
<tr>
<td>GM_CODE</td>
<td></td>
<td>Always set to 03</td>
</tr>
<tr>
<td>PSTNG_DATE</td>
<td>Date Time (dateTime)</td>
<td></td>
</tr>
<tr>
<td>DOC_DATE</td>
<td>Date Time (dateTime)</td>
<td></td>
</tr>
<tr>
<td>Storage Location (STGE_LOC)</td>
<td>Storage location</td>
<td>Floor Stock Storage Location available for the selected Inventory ID. If not available, the value is defined in ERP Production Storage Location field in Material Maintenance.</td>
</tr>
<tr>
<td><strong>Batch Number</strong> (BATCH)</td>
<td><strong>Batch Number</strong> (batchNumber)</td>
<td></td>
</tr>
<tr>
<td>Consumption Quantity (ENTRY_QNT)</td>
<td>Consumption Quantity</td>
<td></td>
</tr>
<tr>
<td>Order Number (ORDERID)</td>
<td>Shop Order for pegged inventory (shopOrder)</td>
<td></td>
</tr>
<tr>
<td>MOVE_TYPE</td>
<td>261</td>
<td></td>
</tr>
<tr>
<td>ACTIVITY</td>
<td>Reporting Step</td>
<td>Reporting step of a routing step where component was assembled</td>
</tr>
<tr>
<td>GOODSMTV_SERIALNUMBER segment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SERIALNO</td>
<td></td>
<td>ERP_SERIAL_NUMBER field collected during assembly</td>
</tr>
</tbody>
</table>
3.2.2.3.10 Mapping a Production Order Complete

Data is transferred from SAP Digital Manufacturing Cloud for execution to SAP ERP by calling the BAPI_PORDORDCONF_CREATE_TT BAPI.

This table contains field names in SAP ERP and their corresponding field names in SAP Digital Manufacturing Cloud for execution:

<table>
<thead>
<tr>
<th>SAP ERP</th>
<th>SAP Digital Manufacturing Cloud for Execution</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plant (PLANT)</td>
<td>Plant</td>
<td></td>
</tr>
<tr>
<td>Order Id (ORDERID)</td>
<td>Order Number</td>
<td></td>
</tr>
<tr>
<td>Operation (OPERATION)</td>
<td>Operation</td>
<td></td>
</tr>
<tr>
<td>Yield (YIELD)</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>FIN_CONF</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>CLEARGRESS</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

3.2.2.3.11 Mapping a Release Order to MES

Data is transferred from SAP Digital Manufacturing Cloud for execution to SAP MES.

This table contains field names in SAP MES and their corresponding field names in SAP Digital Manufacturing Cloud for execution:

<table>
<thead>
<tr>
<th>SAP MES</th>
<th>SAP Digital Manufacturing Cloud for Execution</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plant (plant)</td>
<td>Plant</td>
<td></td>
</tr>
<tr>
<td>Order Id BO (shopOrderRef)</td>
<td>Order Number BO</td>
<td></td>
</tr>
<tr>
<td>Quantity to release (quantityToRelease)</td>
<td>Quantity to Release</td>
<td></td>
</tr>
<tr>
<td>Work Center BO (workCenterRef)</td>
<td>Work Center BO</td>
<td>Optional</td>
</tr>
<tr>
<td>Add to new lot (addToNewLot)</td>
<td>Add to new lot</td>
<td>Optional</td>
</tr>
<tr>
<td>Allow RMA release (allowRmaRelease)</td>
<td>Allow RMA release</td>
<td>Optional</td>
</tr>
<tr>
<td>Labor Charge Code BO (laborChargeCodeRef)</td>
<td>Labor Charge Code BO</td>
<td>Optional</td>
</tr>
</tbody>
</table>
### 3.2.2.3.12 Mapping an Updated Order Schedule to MES

Data is transferred from SAP Digital Manufacturing Cloud for execution to SAP MES.

This table contains field names in SAP MES and their corresponding field names in SAP Digital Manufacturing Cloud for execution:

<table>
<thead>
<tr>
<th>SAP MES</th>
<th>SAP Digital Manufacturing Cloud for Execution</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>New SFC List segment</strong></td>
<td></td>
<td>Zero or more repetitions</td>
</tr>
<tr>
<td><strong>SFC Number (id)</strong></td>
<td><strong>SFC Number</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Plant (plant)</strong></td>
<td><strong>Plant</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Shop Order Schedule segment</strong></td>
<td></td>
<td>1 or more repetitions</td>
</tr>
<tr>
<td><strong>Plant (plant)</strong></td>
<td><strong>Plant</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Router step BO (routerStepRef)</strong></td>
<td><strong>Routing step BO</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Sequence (sequence)</strong></td>
<td><strong>Sequence</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Resource BO (resourceRef)</strong></td>
<td><strong>Resource BO</strong></td>
<td>Optional</td>
</tr>
<tr>
<td><strong>Split ID (splitId)</strong></td>
<td><strong>Split ID</strong></td>
<td>Optional</td>
</tr>
<tr>
<td><strong>Planned Quantity (plannedQuantity)</strong></td>
<td><strong>Planned Quantity</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Confirmed Quantity (confirmedQuantity)</strong></td>
<td><strong>Confirmed Quantity</strong></td>
<td>Optional</td>
</tr>
<tr>
<td><strong>Planned start date (startDate)</strong></td>
<td><strong>Planned start date</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Planned end date (endDate)</strong></td>
<td><strong>Planned end date</strong></td>
<td>Optional</td>
</tr>
<tr>
<td><strong>Resource ERP ID (resourceErpInternalId)</strong></td>
<td><strong>Resource ERP ID</strong></td>
<td>Optional</td>
</tr>
<tr>
<td><strong>Shop Order Number BO (shopOrderRef)</strong></td>
<td><strong>Order Number BO</strong></td>
<td></td>
</tr>
</tbody>
</table>
3.2.2.4 Data Management

Data Replication Filters
Data Replication Filters (DRF) can be set up for master data and transaction data integration from SAP S/4HANA to SAP Digital Manufacturing Cloud for execution.

For more information, see ERP-MES Integration (PP-MES)

The following business functions need to be activated for DRF setup.

- LOG_PP_MES_INT_01
- LOG_PP_MES_INT_02
- LOG_PP_MES_INT_03

3.2.2.5 Plant Conversion

You can enable plant conversion feature to manage more than one plant with the system.

If you need to integrate more than one ERP systems to SAP Digital Manufacturing Cloud, you can use this feature to convert ERP plants to corresponding plants in the system.

**Note**
Plant conversion is supported for production orders (LOIPRO04) and process orders (LOIPRO05).

Follow the steps below to configure plant mapping values in SAP Cloud Integration.

- Log on to SAP Cloud Integration and choose the *Click to work with content packages* icon in the side bar menu.
- Search for the *SAP S/4HANA Integration with SAP Digital Manufacturing Cloud* package.
- Choose the package and choose the *Artifacts* tab.
- In *Plant Value Mapping* artifact, choose *Actions > Configure*.
- Enter in ERP column the plant name maintained in ERP system, and in corresponding DMC column the plant name you want to be maintained in SAP Digital Manufacturing Cloud.

Related Information

How to Get SAP Cloud Integration Management URL [page 30]
3.2.3 Upgrade Information

This section describes the manual activities that are required with the upgrade of SAP Digital Manufacturing Cloud for execution.

Update SAP Cloud Integration Package

To use certain new features of the new release, you need to update the respective SAP Cloud Integration package. You can only update the package to the latest version.

1. Log on to your SAP Cloud Integration tenant. To find the URL for the SAP Cloud Integration, see How to Get SAP Cloud Integration Management URL [page 30].
2. Choose the Click to work with content packages icon in the side bar menu.

When the update is completed, you can see the supported new features in the Change log of the Documents tab.

Deploy iFlows

To enable the new features of each release, you need to deploy the respective artifacts in SAP Cloud Integration.

1. Log on to your SAP Cloud Integration tenant. To find the URL for the SAP Cloud Integration, see How to Get SAP Cloud Integration Management URL [page 30].
2. Choose the Click to work with content packages icon in the side bar menu.
4. In the Artifacts tab, find the artifacts of new features you want to enable, and choose the Action icon.
5. Choose Deploy.
3.2.4 Restrictions and Limitations

This page lists the current restrictions and limitations of SAP ERP or SAP S/4HANA integration.

- **Goods Issue**
  The goods issue from central storage location can’t be triggered from SAP Digital Manufacturing Cloud. It is currently triggered from SAP ERP or SAP S/4HANA.

- **Goods Movement**
  The goods movement from production storage location and between production storage locations can’t be triggered from integrated SAP ERP or SAP S/4HANA system. It is currently triggered from SAP Digital Manufacturing Cloud only.

- **Material-Level Batch Management**
  Material level is the only supported batch level. The batch number is unique in all plants in connection with the material. Plant level and client level batch management are currently not available.

  **Note**
  You must choose the material level as the batch level in SAP ERP or SAP S/4HANA systems. Otherwise, you might encounter inventory transfer issues from ERP systems to SAP Digital Manufacturing Cloud.

- **Long Material Number and Batch**
  Long material number is not supported in all batch scenarios including inventory download with batch number, batch creation, batch characteristic update and goods receipt with batch number.

- **Integration Scenarios of Process Industry**
  For more information about the integration scenarios that are currently not available for the process industry, see the Limitations section in 2968056.

- **Backflush Enabled Material**
  If backflush is enabled for a material in ERP, when you transfer relative production or process orders from SAP S/4HANA, the backflush indicator is not downloaded with the order. This may cause some data inconsistencies between SAP Digital Manufacturing Cloud and SAP S/4HANA in transactions such as goods issue or goods receipt.
3.3 Integration with SAP S/4HANA Cloud

You can enable the communication between SAP S/4HANA Cloud and SAP Digital Manufacturing Cloud.

**i Note**

Since SAP Digital Manufacturing Cloud is a software service on SAP Business Technology Platform, Cloud Foundry environment, integration with SAP S/4HANA Cloud doesn’t require SAP Cloud Integration or cloud connector which are both used for integration between cloud application and on-premise systems.

Use the communication management apps to enable data exchange between SAP Digital Manufacturing Cloud and SAP S/4HANA Cloud.

After you have completed the onboarding procedures as mentioned in Onboarding and User Management, you can continue with the configurations that are required to build up connectivity between SAP Digital Manufacturing Cloud and integrated SAP S/4HANA Cloud. For detailed steps, see Connecting to SAP S/4HANA Cloud [page 132].

For more details about supported data exchange between the systems, see Integration Scenarios [page 155].

**Related Information**

Restrictions and Limitations [page 198]

### 3.3.1 Connecting to SAP S/4HANA Cloud

You can transfer data between SAP S/4HANA Cloud and SAP Digital Manufacturing Cloud for execution using various communication arrangements.

This page demonstrates the steps that are required to enable data transfer between these two systems.
Create Destinations

Create destinations for an SaaS-tenant in SAP Digital Manufacturing Cloud for execution.

Use the following destinations for inbound integration:
- S4H_ODATA_INTEGRATION
- S4H_INTEGRATION_OAUTH

Use the following destinations for outbound integration:
- S4H_ODATA_INTEGRATION

For more information, see Creating Destinations [page 152].

Create a Communication User

Create a communication user in SAP S/4HANA Cloud for inbound calls. For more information, see Creating a Communication User [page 136].
Create a Communication System

Create a communication system in SAP S/4HANA Cloud.

To create a communication system, you need to provide the following:

- The application route link of the integration microservice for the host name (use the value of the "manufacturing-execution-integration" property in the service key of the service instance). For more information, see Configuring a Service Broker [page 135].

- A user ID and password for the outbound communication user (taken from the Saas-tenant, in the service key of the service instance). For more information, see Configuring a Service Broker [page 135].

For more information, see Creating a Communication System [page 136].

Create a Communication Arrangement

Select one of the following communication scenarios in SAP S/4HANA Cloud to create a communication arrangement:

<table>
<thead>
<tr>
<th>Communication Scenario ID</th>
<th>Communication Scenario Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAP_COM_0009</td>
<td>Product Integration</td>
</tr>
<tr>
<td>SAP_COM_0105</td>
<td>Product Lifecycle Management - Master Data Integration</td>
</tr>
<tr>
<td>SAP_COM_0163</td>
<td>Classification Systems OData Integration</td>
</tr>
<tr>
<td>SAP_COM_0309</td>
<td>Product Classification Integration</td>
</tr>
<tr>
<td>SAP_COM_0519</td>
<td>Production Planning Master Data Integration</td>
</tr>
<tr>
<td>SAP_COM_0522</td>
<td>Manufacturing Execution - Order and Confirmation Integration</td>
</tr>
</tbody>
</table>

For more information, see Creating Communication Arrangements [page 137].

Confirm Integration

Confirm the transfer of a specific business object (for example, a product or master recipe) from an application in SAP S/4HANA Cloud (for example, the Replicate by Object Selection app or the Replicate by Model Selection app) to SAP Digital Manufacturing Cloud for execution.

After setting up this integration, you need to configure the collaboration links in the Manage Collaboration Links app. Use the links below to set up the integration for master data and transaction data.

i Note

Do not enter any personal data in any text fields or in any files uploaded to SAP Digital Manufacturing Cloud.

Related Information

Integration of Master Data [page 156]
3.3.1.1 Configuring a Service Broker

To generate a service key, you need to configure a service broker.

Prerequisites

- You need the necessary authentication credentials to access the system.

Procedure

1. In the SAP BTP Cockpit, choose the correct *Global Account* and *Subaccount* where SAP Digital Manufacturing Cloud for execution is provisioned and then *Enable Cloud Foundry*.
2. When prompted for a Cloud Foundry organization name, enter a name and choose *Create*.
3. After the organization is created, choose *Spaces*.
4. Choose *Create Space*, enter a space name and assign yourself as space manager and space developer.
5. For SAP S/4HANA Cloud integration, choose *Entitlements* > *Configure Entitlements* > *Add Service Plans* > *Digital Manufacturing Services* > *execution* > *Add 1 Service Plan* > *Save*.
6. Choose *Spaces* and then *Services* > *Service Marketplace*.
7. Select Digital Manufacturing Cloud Services.
8. Select *Instances*.
9. To create a new service instance, choose *New Instance*.

   **Note**
   
   You can create a new service instance with the following CF CLI command: `cf create-service <service> <plan> <service-instance> -c parameters.json`. For more information, see Create Service.

10. Go to *SAP Cloud Platform cockpit (of Execution in SAP Digital Manufacturing Cloud)* > *Services* > *Service Instances*.
11. Select the service instance created in the previous steps.
12. Select *Service Keys*.
13. To create a new service key for the service instance, choose *Create Service Key*.

   **Note**
   
   You can create a new service key with the following CF CLI command: `cf create-service-key SERVICE_INSTANCE SERVICE_KEY [-c PARAMETERS_AS_JSON]`. For more information, see Create Service Key.
14. Verify the uaa information against the service key.

Note

The new content of the service key can be viewed by using the following CF CLI command: `cf service-key SERVICE_INSTANCE SERVICE_KEY`. For more information, see Create Service Key.

### 3.3.1.2 Creating a Communication User

You need to create a communication user to set up a communication arrangement.

**Prerequisites**

To create a communication user, you need to be assigned a business role, for example the business role of `SAP_BR_ADMINISTRATOR` (Administrator).

**Procedure**

1. Log on as an administrator to the SAP Fiori launchpad in the SAP S/4HANA Cloud system.
3. Choose New.
4. Enter the user name, description, and password.
5. Choose Create.
6. Make note of the user data. User data is required when you create the communication arrangement.

### 3.3.1.3 Creating a Communication System

Create a communication system to later link to a communication arrangement.

**Procedure**

1. Access the SAP S/4HANA Cloud system and log on as an administrator.
3. To create a new communication system, choose New.
4. On the New Communication System screen, make the following entries:
5. Choose Create.

6. In the General tab, make the following entries in the Technical Data section:
   - **Host Name**: Enter the microservice application route taken from the service key under the property manufacturing-execution-integration.
   - **Logical System ID**: Enter the ID, for example DME_DEV.
   - **Port**: Use the default value, for example, 443.
   - **Business System**: Enter the ID of the business system, for example DMC_DME_DEV.

7. In the User for Inbound Communication tab, choose Add to specify user name and Select User Name and Password as the Authentication Method. And then choose OK. Use the same credentials that were used to create the communication user.

8. In the User for Outbound Communication tab, for the Authentication Method, select User Name and Password. For the user name and password for the outbound communication user, use the clientid and clientsecret from the service key, created during service broker configuration.

9. In the Business Partners tab, select the business partner.

10. Choose Create and save your work.

### 3.3.1.4 Creating Communication Arrangements

A communication arrangement specifies the metadata for a specific communication scenario, such as material replication. The metadata for the communication arrangement is contained in a service key. You can define one or more destinations for a communication arrangement.

You need to create a communication arrangement to allow inbound communication to the SAP S/4HANA Cloud tenant and outbound communication to the SAP Digital Manufacturing Cloud for execution tenant. The communication arrangement defines the user and the system for specific communication scenarios.

For general information on communication arrangements and how to create them, see How to Create a Communication Arrangement in the SAP Cloud Platform documentation on the SAP Help Portal.

### 3.3.1.4.1 Product Integration (SAP_COM_0009)

This communication arrangement is for downloading materials from SAP S/4HANA Cloud to SAP Digital Manufacturing Cloud for execution.

**Prerequisites**

You have generated a service key and created a communication user and a communication system.
Procedure

To create the communication arrangement for product integration, follow these steps:

1. Log on to SAP Fiori launchpad in the SAP S/4HANA Cloud system.
2. Open the Communication Arrangements app.
3. To create a new communication arrangement, choose New.
4. Select the communication scenario SAP_COM_0009 (Product Integration).
5. The Arrangement Name field is filled automatically with the name of the selected Product Integration integration scenario. Adapt the Arrangement Name if required.
6. Choose Create.
7. In the Common Data section, select the Communication System that was created earlier from the input help. The communication user that was created earlier is automatically added to the Inbound Communication section.
8. In Outbound Communication, select a user. The default user in the User Name value help is the user that is associated with this Communication System. When you choose this user, the system defaults the Authentication Method assigned to this user.
9. In the Outbound Services section, activate the Product Master - Replicate from SAP S/4HANA to Client service.
10. In the Path for the Product Master - Replicate from SAP S/4HANA to Client service, enter /ws?X-Identity-Zone-Subdomain=<subdomain>. You can see the <subdomain> value in the SaaS tenant overview on SAP BTP Cockpit.
11. Choose Save.
12. In the Job Execution Details section, specify the frequency for job execution by entering the relevant value in the Run Every field. If the job is scheduled, the Job Status becomes Active. You can also specify the number of objects that can be replicated in one job execution.
13. Under *Additional Properties*, in the *Replication Model* field, enter the name of any replication model that you want to create for the selected outbound interfaces. If you have enabled *Job Execution*, choose the replication mode C.

14. Choose an *Output Mode*. If *Job Execution* is enabled, you have to choose output mode P.

15. In the *System Filter* dropdown list, select the relevant option, set it to active or inactive mode, and choose *Save*.

Note that for complete material replication, you need to configure three communication scenarios:

- **SAP_COM_0009** for product integration
- **SAP_COM_0163** for classification systems OData integration
- **SAP_COM_0309** for product classification integration

**Related Information**

Classification Systems OData Integration (SAP_COM_0163) [page 141]
Product Classification Integration (SAP_COM_0309) [page 144]

### 3.3.1.4.2 Product Lifecycle Management - Master Data Integration (SAP_COM_0105)

This communication arrangement is for downloading BOM data from SAP S/4HANA Cloud to SAP Digital Manufacturing Cloud for execution.

**Prerequisites**

You have generated a service key and created a communication user and a communication system.

**Procedure**

To create this communication arrangement, complete the following steps:

1. Log on to SAP Fiori launchpad in the SAP S/4HANA Cloud system.
2. Open the *Communication Arrangements* app.
3. To create a new communication arrangement, choose *New*.
4. Select the communication scenario **SAP_COM_0105** (*Product Lifecycle Management - Master Data Integration*).
5. The *Arrangement Name* field is filled automatically with the name of the selected *Product Lifecycle Management - Master Data Integration* integration scenario. Adapt the *Arrangement Name* if required.
6. Choose *Create*. 
7. In the **Common Data** section, select the **Communication System** that was created earlier from the input help. The communication user that was created earlier is automatically added to the **Inbound Communication** section. The inbound services added to the communication scenario in the backend system is reflected here in the communication arrangement under **Inbound Services**.

8. To activate the communication arrangement, choose **Save**.

### 3.3.1.4.3 Material Document Integration (SAP_COM_0108)

This communication arrangement is for receiving goods movement from SAP Digital Manufacturing Cloud for execution to SAP S/4HANA Cloud.

#### Prerequisites

You have generated a service key and created a communication user and a communication system with Business Partner attached.

#### Procedure

To create the communication arrangement for material document integration, follow these steps:

1. Log on to SAP Fiori launchpad in the SAP S/4HANA Cloud system.
2. Open the **Communication Arrangements** app.
3. To create a new communication arrangement, choose **New**.
4. Select the communication scenario **SAP_COM_0108 (Material Document Integration)**.
5. The **Arrangement Name** field is filled automatically with the name of the selected integration scenario. Adapt the **Arrangement Name** if required.
6. Choose **Create**.
7. In the **Common Data** section, select the **Communication System** that was created earlier from the input help. The communication user that was created earlier is automatically added to the **Inbound Communication** section.
8. In **Outbound Communication** section, select a user. The default user in the **User Name** is the user that is associated with this **Communication System**. When you choose this user, the system defaults the **Authentication Method** assigned to this user.
9. In the **Outbound Services** section, make sure **Service Status** is **Active**.
10. In the **Path** for the **Material Document – Receive Confirmation**, enter `/ws?X-Identity-Zone-Subdomain=<subdomain>`. You can see the `<subdomain>` value in the SaaS tenant overview in SAP BTP Cockpit.
11. To activate the communication arrangement, choose **Save**.
iNote

To enable the integration communication, you also need to go to SAP Digital Manufacturing Cloud, and make sure that the collaboration link COLLABORATION_ERP_INV_CLEAR_RESERVATION is mapped to the directive ERP_INVENTORY_CLEAR_RESERVATION in the Manage Collaboration Links app.

Related Information

Material Document Outbound Notification Integration (SAP_COM_0263) [page 142]

3.3.1.4.4 Classification Systems OData Integration (SAP_COM_0163)

This communication arrangement is for downloading material classifications and integrating with SAP S/4HANA Cloud using the OData protocol.

Prerequisites

You have generated a service key and created a communication user and a communication system.

Procedure

To create this communication arrangement, complete the following steps:
1. Log on to SAP Fiori launchpad in the SAP S/4HANA Cloud system.
2. Open the Communication Arrangements app.
3. To create a new communication arrangement, choose New.
4. Select the communication scenario SAP_COM_0163 (Classification Systems OData Integration) from the pick list.
5. The Arrangement Name field is filled automatically with the name of the selected Classification Systems OData Integration integration scenario. Adapt the Arrangement Name if required.
6. Choose Create.
7. In the Common Data section, select the Communication System that was created earlier from the input help. The communication user that was created earlier is automatically added to the Inbound Communication section.
8. The inbound services added to the communication scenario in the backend system will be reflected here in the communication arrangement under Inbound Services. The inbound services added to SAP_COM_0163 are Remote API for Classification Class and Remote API for Classification Characteristic.
9. To activate the communication arrangement, choose Save.

### 3.3.1.4.5 Material Document Outbound Notification Integration (SAP_COM_0263)

This communication arrangement is for sending goods movement from SAP S/4HANA Cloud to SAP Digital Manufacturing Cloud for execution.

**Prerequisites**

You have generated a service key and created a communication user and a communication system with Business Partner attached.

**Procedure**

To create the communication arrangement for product integration, complete the following steps:

1. Log on to SAP Fiori launchpad in the SAP S/4HANA Cloud system.
2. Open the Communication Arrangements app.
3. To create a new communication arrangement, choose New.
4. Select the communication scenario SAP_COM_0263 (Material Document Outbound Notification Integration).
5. The Arrangement Name field will be filled automatically with the name of the selected integration scenario. Adapt the Arrangement Name if required.
6. Choose Create.
7. In the Common Data section, select the Communication System that was created earlier from the input help. The communication user that was created earlier is automatically added to the Outbound Communication section.
8. In the Outbound Services section, make sure the Service Status is Active.
10. Choose Save.
11. Open the Output Parameter Determination app.

**i Note**
To know more about how to define output settings for specific business objects, see Output Parameter Determination.

12. In the Select Business Rule section, select Goods Movement for Show Rules for and select Output Type for Determination Step.
14. In Table Contents, set content value for output type MMIM_MATDOC_GDSMVMT_ESOA (Goods Movement ESOA)
   - Print Active = X(Yes)
   - Plant = The plant for integration
   - Movement Type = 311
15. Choose Activate to save and apply the settings.

**Related Information**

Material Document Integration (SAP_COM_0108) [page 140]
3.3.1.4.6 **Product Classification Integration (SAP_COM_0309)**

This communication arrangement is for downloading material classifications and integrating with SAP S/4HANA Cloud.

**Prerequisites**

You have generated a service key and created a communication user and a communication system.

**Procedure**

To create this communication arrangement, complete the following steps:

1. Log on to SAP Fiori launchpad in the SAP S/4HANA Cloud system.
2. Open the Communication Arrangements app.
3. To create a new communication arrangement, choose **New**.
4. Select the communication scenario **SAP_COM_0309 (Product Classification Integration)** from the pick list.
5. The **Arrangement Name** field is filled automatically with the name of the selected **Product Classification Integration** integration scenario. Adapt the **Arrangement Name** if required.
6. Choose **Create**.
7. In the **Common Data** section, select the **Communication System** that was created earlier from the input help. The communication user that was created earlier is automatically added to the **Inbound Communication** section.
8. The inbound services added to the communication scenario in the backend system will be reflected here in the communication arrangement under **Inbound Services**. The inbound services added to **SAP_COM_0309** are **Remote API for Product data incl. Classification**.
9. To activate the communication arrangement, choose **Save**.

3.3.1.4.7 **Batch Management OData Integration (SAP_COM_0337)**

This communication arrangement is for generating batch numbers in SAP S/4HANA Cloud and transferring them to SAP Digital Manufacturing Cloud for execution.

**Prerequisites**

You have generated a service key and created a communication user and a communication system.
Procedure

To create the communication arrangement for batch management integration, complete the following steps:

1. Log on to SAP Fiori launchpad in the SAP S/4HANA Cloud system.
2. Open the Communication Arrangements app.
3. To create a new communication arrangement, choose New.
4. Select the communication scenario SAP_COM_0337 (Batch Management OData Integration).
5. The Arrangement Name field will be filled automatically with the name of the selected integration scenario. Adapt the Arrangement Name if required.
6. Choose Create.
7. In the Common Data section, select the Communication System that was created earlier from the input help. The communication user that was created earlier is automatically added to the Inbound Communication section.
8. In Inbound Communication, select a user. The system defaults the Authentication Method assigned to this user.
9. To activate the communication arrangement, choose Save.

i Note

To enable the integration communication, you also need to go to SAP Digital Manufacturing Cloud, and make sure that the collaboration link COLLABORATION_BATCH_CREATION is mapped to the directive BATCH_CREATION in the Manage Collaboration Links app.

Related Information

Creating Batch Numbers

3.3.1.4.8 Production Planning Master Data Integration (SAP_COM_0519)

This communication arrangement is for downloading a master recipe with a production version from SAP S/4HANA Cloud to SAP Digital Manufacturing Cloud for execution.

Prerequisites

You have generated a service key and created a communication user and a communication system.
Procedure

To create this communication arrangement, complete the following steps:

1. Log on to SAP Fiori launchpad in the SAP S/4HANA Cloud system.
2. Open the Communication Arrangements app.
3. To create a new communication arrangement, choose New.
4. Select the communication scenario SAP_COM_0519 (Production Planning Master Data Integration).
5. The Arrangement Name field is filled automatically with the name of the selected Production Planning Master Data Integration integration scenario. Adapt the Arrangement Name if required.
6. Choose Create.
7. In the Common Data section, select the Communication System that was created earlier from the input help. The communication user that was created earlier is automatically added to the Inbound Communication section.
8. In the Outbound Communication, the user which is associated with the Communication System will be shown by default in the value help for the User Name field. By choosing the user, the Authentication Method is defaulted with same authentication method associated with this user.
9. In the Outbound Services section, make sure that the Service Status checkbox is selected for every SOAP which makes the service Active. The following services should be Active:
   ○ Master Recipe – Replicate
   ○ Production Version - Replicate
   ○ Work Center – Replicate
10. In the Path for every SOAP service mentioned above, enter /ws?X-Identity-Zone-Subdomain=<subdomain>. You can see the <subdomain> value in the SaaS tenant overview in SAP BTP Cockpit.
11. In the Job Execution Details section, you can specify how frequently the job is executed by entering the relevant value in the Run Every field. Once the job is scheduled, the Job Status becomes Active. You can also specify the size of the objects that can be replicated during one job.
12. In the Additional Properties section, in the Replication Model field, enter the name of any replication model that you want to create for this SOAP. If you have enabled job execution, choose a Replication Mode.
13. Choose an Output Mode. If the job execution is enabled, you must choose output mode P.
14. In the input help of the System Filter field, select active or inactive mode, depending on your requirements.
15. To activate the communication arrangement, choose Save.

3.3.1.4.9 Manufacturing Execution - Order and Confirmation Integration (SAP_COM_0522)

This communication arrangement is for downloading a production / process order from SAP S/4HANA Cloud to SAP Digital Manufacturing Cloud for execution.

Prerequisites

You have generated a service key and created a communication user and a communication system.
To create this communication arrangement, complete the following steps:

1. Log on to SAP Fiori launchpad in the SAP S/4HANA Cloud system.
2. Open the Communication Arrangements app.
3. To create a new communication arrangement, choose New.
4. Select the communication scenario SAP_COM_0522 (Manufacturing Execution - Order and Confirmation Integration).
5. The Arrangement Name field is filled automatically with the name of the selected Manufacturing Execution - Order and Confirmation Integration integration scenario. Adapt the Arrangement Name if required.
6. Choose Create.
7. In the Common Data section, select the Communication System that was created earlier from the input help. The communication user that was created earlier is automatically added to the Inbound Communication section. The included inbound services are listed in the Inbound Services section.

<table>
<thead>
<tr>
<th>Interaction</th>
<th>SAP S/4HANA Cloud</th>
<th>Format</th>
<th>SAP S/4HANA Cloud Interface</th>
</tr>
</thead>
<tbody>
<tr>
<td>Process Order Confirmation</td>
<td>Inbound</td>
<td>OData V2</td>
<td>API_PROC_ORDER_CONFIRMATION_2_SRV</td>
</tr>
<tr>
<td>Production Order Confirmation</td>
<td>Inbound</td>
<td>OData V2</td>
<td>API_PROD_ORDER_CONFIRMATION_2_SRV</td>
</tr>
<tr>
<td>Production Order (Version 2)</td>
<td>Inbound</td>
<td>OData V2</td>
<td>API_PRODUCTION_ORDER_2_SRV</td>
</tr>
<tr>
<td>Process Order (Version 2)</td>
<td>Inbound</td>
<td>OData V2</td>
<td>API_PROCESS_ORDER_2_SRV</td>
</tr>
</tbody>
</table>

8. In Outbound Communication, the user which is associated with the Communication System will be shown by default in the value help for the User Name field. By choosing the user, the Authentication Method is defaulted with same authentication method associated with this user.

<table>
<thead>
<tr>
<th>Interaction</th>
<th>SAP S/4HANA Cloud</th>
<th>Format</th>
<th>SAP S/4HANA Cloud Interface</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacturing Order - Send</td>
<td>Outbound</td>
<td>SOAP</td>
<td>CO_PPINT_MFGORD_EXECT_REQ_OUT_SPRX</td>
</tr>
</tbody>
</table>

9. In the Outbound Services section, make sure that the Service Status checkbox is selected for Manufacturing Order - Send, Version 2, which makes the service Active.

**Note**

In the SAP S/4HANA Cloud solution, the delivered order types are set by default to shop floor distribution if a communication scenario is created. Therefore, by activating this integration scenario, all orders will automatically be distributed to your shop floor system unless you define special filter.
criteria. Without a filter, order confirmation can no longer be done within the SAP S/4HANA Cloud system. It's done in your shop floor system and sent back to the SAP S/4HANA Cloud system.

10. In the Path for Manufacturing Order - Send, Version 2, enter enter /ws?X-Identity-Zone-Subdomain=<subdomain>. You can see the <subdomain> value in the SaaS tenant overview in SAP BTP Cockpit.

11. In the Additional Properties section, enter the following data:

<table>
<thead>
<tr>
<th>1st Column (Property Name)</th>
<th>2nd Column (Property Value)</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material</td>
<td>&lt;your material&gt;</td>
<td>Select the material for which production orders will be distributed to your shop floor system.</td>
</tr>
<tr>
<td>i Note</td>
<td></td>
<td>For the demo data used within this scope item, please refer to the master data overview document.</td>
</tr>
<tr>
<td>Order Type</td>
<td>&lt;your order type&gt;</td>
<td>Select the order type of the production orders that will be distributed to your shop floor system.</td>
</tr>
<tr>
<td>Plant</td>
<td>&lt;your plant&gt;</td>
<td>Select your plant using the value help.</td>
</tr>
</tbody>
</table>

12. To activate the communication arrangement, choose Save.

i Note
To enable the integration communication arrangement, you also need to go to SAP Digital Manufacturing Cloud and make sure that the collaboration link COLLABORATION_QUANTITY_CONFIRMATION is mapped to the directive QUANTITY_CONFIRMATION and the collaboration link COLLABORATION_GOODS_RECEIPT_CONFIRMATION is mapped to the directive GOODS_RECEIPT_CONFIRMATION in the Manage Collaboration Links app.

Related Information
Configuring a Service Broker [page 135]
### 3.3.1.4.10 Inspection Master Data Integration (SAP_COM_0110)

This communication arrangement is for retrieving inspection information from SAP S/4HANA Cloud to SAP Digital Manufacturing Cloud for execution.

#### Prerequisites

You have generated a service key and created a communication user and a communication system.

#### Procedure

To create this communication arrangement, complete the following steps:

1. Log on to SAP Fiori launchpad in the SAP S/4HANA Cloud system.
2. Open the *Communication Arrangements* app.
3. To create a new communication arrangement, choose *New*.
4. Select the communication scenario *SAP_COM_0110 (Inspection Master Data Integration)* from the pick list.
5. The *Arrangement Name* field is filled automatically with the name of the selected integration scenario. Adapt the *Arrangement Name* if required.
6. Choose *Create*.
7. In the *Common Data* section, select the *Communication System* that was created earlier from the input help.
8. In *Inbound Communication*, select a user. The system defaults the *Authentication Method* assigned to this user.
9. The inbound services added to the communication scenario in the backend system will be reflected here in the communication arrangement under *Inbound Services*.
10. To activate the communication arrangement, choose *Save*. 
### 3.3.1.4.11 Quality Inspection Process Integration (SAP_COM_0318)

This communication arrangement is for uploading inspection recording results from SAP Digital Manufacturing Cloud for execution to SAP S/4HANA Cloud.

**Prerequisites**

You have generated a service key and created a communication user and a communication system.

**Procedure**

To create this communication arrangement, complete the following steps:

1. Log on to SAP Fiori launchpad in the SAP S/4HANA Cloud system.
2. Open the Communication Arrangements app.
3. To create a new communication arrangement, choose New.
4. Select the communication scenario SAP_COM_0318 (Quality Inspection Process Integration) from the pick list.
5. The Arrangement Name field is filled automatically with the name of the selected integration scenario. Adapt the Arrangement Name if required.
6. Choose Create.
7. In the Common Data section, select the Communication System that was created earlier from the input help. The communication user that was created earlier is automatically added to the Inbound Communication section.
8. In Inbound Communication, select a user. The system defaults the Authentication Method assigned to this user.
9. The inbound services added to the communication scenario in the backend system will be reflected here in the communication arrangement under Inbound Services.
10. To activate the communication arrangement, choose Save.

### 3.3.1.4.12 Defect Processing Integration (SAP_COM_0153)

This communication arrangement is for transferring Quality Management (QM) defect code groups and codes from SAP S/4HANA Cloud to SAP Digital Manufacturing Cloud.

**Prerequisites**

You have generated a service key and created a communication user and a communication system.
Procedure

To create the communication arrangement for defect processing integration, complete the following steps:

1. Log on to SAP Fiori launchpad in the SAP S/4HANA Cloud system.
2. Open the **Communication Arrangements** app.
3. To create a new communication arrangement, choose **New**.
4. Select the communication scenario **SAP_COM_0153 (Defect Processing Integration)**.
5. The **Arrangement Name** field will be filled automatically with the name of the selected integration scenario. Adapt the **Arrangement Name** if required.
6. Choose **Create**.
7. In the **Common Data** section, select the **Communication System** that was created earlier from the input help. The communication user that was created earlier is automatically added to the **Inbound Communication** section.
8. In **Inbound Communication**, select a user. The system defaults the **Authentication Method** assigned to this user.
9. To activate the communication arrangement, choose **Save**.

### 3.3.1.4.13 Material Stock Integration (SAP_COM_0164)

This communication arrangement is for retrieving inventory stock information from SAP S/4HANA Cloud to SAP Digital Manufacturing Cloud.

**Prerequisites**

You have generated a service key and created a communication user and a communication system.

**Procedure**

To create this communication arrangement, complete the following steps:

1. Log on to SAP Fiori launchpad in the SAP S/4HANA Cloud system.
2. Open the **Communication Arrangements** app.
3. To create a new communication arrangement, choose **New**.
4. Select the communication scenario **SAP_COM_0164 (Material Stock Integration)** from the pick list.
5. The **Arrangement Name** field is filled automatically with the name of the selected integration scenario. Adapt the **Arrangement Name** if required.
6. Choose **Create**.
7. In the **Common Data** section, select the **Communication System** that was created earlier from the input help.
8. In **Inbound Communication**, select a user. The system defaults the **Authentication Method** assigned to this user.
9. The inbound services added to the communication scenario in the backend system will be reflected here in the communication arrangement under Inbound Services.
10. To activate the communication arrangement, choose Save.

3.3.1.5 Creating Destinations

You need to create destinations in SAP Digital Manufacturing Cloud for execution to complete integration.

The following destination is used for inbound integration:

- S4H_INTEGRATION_OAUTH
- S4H_ODATA_INTEGRATION

The following destination is used for outbound integration:

- S4H_ODATA_INTEGRATION

i Note

In former releases, a third destination, S4HANA_CLOUD_DESTINATION, was used for outbound integration. As of this release, S4H_ODATA_INTEGRATION is used for inbound and outbound integration. The destination S4HANA_CLOUD_DESTINATION is no longer used.

For more information about configuring individual destinations, please refer to the following links.

Related Information

Destination S4H_INTEGRATION_OAUTH [page 152]
Destination S4H_ODATA_INTEGRATION [page 153]

3.3.1.5.1 Destination S4H_INTEGRATION_OAUTH

Configure the S4H_INTEGRATION_OAUTH destination for inbound integration from SAP S/4HANA and SAP S/4HANA Cloud to SAP Digital Manufacturing Cloud for execution.

Procedure

1. Under the corresponding tenant, go to the SAP BTP Cockpit (of Execution in SAP Digital Manufacturing Cloud) ➤ Connectivity ➤ Destinations.
2. Create the destination S4H_INTEGRATION_OAUTH.
3. Enter the name and description of the destination.
4. Select HTTP as Type of Destination for S4H_INTEGRATION_OAUTH.

5. In the URL field, enter the <URL from Service Key>/oauth/token, taken from the service key.

6. Select Internet as Proxy Type.

7. Select OAuth2ClientCredentials as Authentication.

8. Enter the <clientid of Service Key> in the Client ID and the <clientsecret of Service Key> in the Client Secret.

**i Note**

To find <clientid of Service Key> and the <clientsecret of Service Key>, log on to SAP BTP Cockpit PaaS Tenant (of Execution in SAP Digital Manufacturing Cloud), enter a space and choose Services ➤ Service Instances ➤ Service Key ➤ and check the uaa tag.

9. Enter the <URL from Service Key>/oauth/token in the Token Service URL.

10. Under Additional Properties check that Use default JDK truststore has been selected.

The destination data will be used by SAP Digital Manufacturing Cloud for execution to provide authentication and authorization for SAP S/4HANA and SAP S/4HANA Cloud integration.

### 3.3.1.5.2 Destination S4H_ODATA_INTEGRATION

Configure the S4H_ODATA_INTEGRATION destination for inbound and outbound integration between SAP S/4HANA Cloud and SAP Digital Manufacturing Cloud for execution.

**Procedure**

1. Under the corresponding tenant, go to the SAP Cloud Platform Cockpit (of SAP Digital Manufacturing Cloud for Execution) ➤ Connectivity ➤ Destinations ➤

2. Create the destination S4H_ODATA_INTEGRATION.

3. Enter the name and description of the destination.

4. Select HTTP as Type of Destination for S4H_ODATA_INTEGRATION.

5. Enter the <S4HCloudURL till ondemand.com>/sap/opu/odata/sap in URL. You can check this from the Service URL taken from the Inbound Services in the SAP S/4HANA Cloud system under any scenario ID that supports inbound Odata communication. For example:
   - SAP_COM_0104
   - SAP_COM_0163
   - SAP_COM_0309
   - SAP_COM_0009

6. Select Internet as Proxy Type.

7. Select BasicAuthentication as Authentication. The destination data will be used by SAP Digital Manufacturing Cloud for execution to provide authentication and authorization for SAP S/4HANA Cloud OData integration.

8. Enter the user and password using the same credentials as maintained by communication users in SAP S/4HANA Cloud.
9. Under Additional Properties check that Use default JDK truststore is selected. The destination data will be used by SAP Digital Manufacturing Cloud for execution to provide authentication and authorization for SAP S/4HANA Cloud integration.

3.3.1.6 Managing Supported Plants

You can connect the SAP S/4HANA Cloud system to plants for integration with SAP Digital Manufacturing Cloud for execution. The global SAP Digital Manufacturing Cloud for execution system is used across all plants.

Prerequisites

- If you integrate SAP Digital Manufacturing Cloud for execution with multiple S/4HANA Cloud systems, these systems need to have different System IDs. Systems are identified at the client level.
- Each plant needs to have a unique plant name across the tenant.
- Plants need to be created and set up for integration in the Manage Plants app.

Related Information

Manage Plants

3.3.1.7 Defining Operations in SAP S/4HANA Cloud for SAP Digital Manufacturing Cloud for Execution

In SAP S/4HANA Cloud, you can define operations to use data in SAP Digital Manufacturing Cloud for execution.

In SAP S/4HANA Cloud, you define on operation level if an operation in a master recipe or routing is relevant for the transfer to SAP Digital Manufacturing Cloud for execution. The tables below show the mapping rules for recipe steps and dependent objects to use in SAP Digital Manufacturing Cloud for execution, such as operation activities, BOM components, and the standard value key in SAP S/4HANA Cloud. These rules are valid for both the process order and master recipe.

i Note

Operation transfer is controlled by exclusion flags. If you set the relevant exclusion flag, the operation will not be downloaded to SAP Digital Manufacturing Cloud for execution. If the flag is not set, the operation will be downloaded together with all dependent objects.
Mapping Rules for an Operation in SAP S/4HANA Cloud

If an operation is flagged `operation IsNot MES Relevant = true`, the system doesn’t transfer this operation or any phase belonging to this operation to SAP Digital Manufacturing Cloud.

If an operation is flagged `operation IsNot MES Relevant = false`, the system transfers this operation and all phases belonging to this operation that are flagged `operation IsNot MES Relevant = false` to SAP Digital Manufacturing Cloud.

If an operation is flagged `operation IsNot MES Relevant = false`, but none of its phases are flagged `operation IsNot MES Relevant = false`, the system does not transfer this operation or any phase belonging to it, to SAP Digital Manufacturing Cloud.

Note that BOM components that are attached to a `not MES Relevant` step are not mapped.

Mapping for an Operation Flag in SAP S/4HANA Cloud

Path of `operation IsNot MES Relevant` flag in ProcessOrder:

```plaintext
/n0:ManufacturingOrderExecuteRequest/
ManufacturingOrder/ManufacturingOrderActivityNetworkElement/n1:OperationControlProfile/
  n1:Operation IsNot MES Relevant
```

Path of `operation IsNot MES Relevant` flag in MasterRecipe:

```plaintext
/n0:ManufacturingMasterRecipeInformation/
BillOfOperations/BillOfOperationsActivityNetworkElement/
  BillOfOperationsActivityNetworkElementTimeSlice/OperationControlProfile/
  n1:Operation IsNot MES Relevant
```

3.3.2 Integration Scenarios

The following scenarios are supported in the integration with SAP S/4HANA Cloud.

- **Integration of Master Data**
  You can transfer master data such as materials, BOMs, routings and work centers from SAP S/4HANA Cloud to SAP Digital Manufacturing Cloud.

- **Integration of Transaction Data**
  You can enable bidirectional transfer of transaction data such as orders, inventory, batch and quality inspection information.

Related Information

Integration of Master Data [page 156]
Integration of Transaction Data [page 161]
### 3.3.2.1 Integration of Master Data

SAP Digital Manufacturing Cloud can be integrated with an SAP S/4HANA Cloud system.

#### Use

You can transfer master data from an SAP S/4HANA Cloud system to an SAP Digital Manufacturing Cloud for execution system.

#### Master Data Integration

Master data represents the business data your company requires about business partners, individuals, organizations, or products. Master data tends to remain unchanged over longer periods of time and supports transactional processes. You can use Master Data Maintenance to maintain master data. For more information about Master Data Maintenance in S/4HANA Cloud, see [Master Data Maintenance](http://help.sap.com) on the SAP Help Portal at [http://help.sap.com](http://help.sap.com).

You can integrate the following master data with SAP S/4HANA Cloud:

<table>
<thead>
<tr>
<th>Master Data Integration from S/4HANA Cloud to SAP Digital Manufacturing Cloud</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SAP S/4HANA Cloud</strong></td>
</tr>
<tr>
<td>Material</td>
</tr>
<tr>
<td>If Classification (Class and Characteristics) data is maintained for a material in SAP S/4HANA Cloud, that data is also downloaded.</td>
</tr>
<tr>
<td>Only <strong>Class Type 023</strong> (Batch) is downloaded.</td>
</tr>
<tr>
<td>Work Center (PP-PI Resource)</td>
</tr>
<tr>
<td>Master Recipe</td>
</tr>
</tbody>
</table>

#### Prerequisites

- You have defined and set up plants for integration using the *Manage Plants* app.

#### Sequence Considerations

- 1. Transfer the work centers.
2. Transfer the materials.
3. Transfer the component materials.
4. Transfer the master recipe.
5. Transfer the process order.
   - Materials must be transferred before master recipe and process order.
   - Finished items must be transferred before routings.

Implementation Considerations

Some functions may behave differently depending on the SAP S/4HANA Cloud version used for integration with SAP Digital Manufacturing Cloud for execution.

Related Information

Integration of Transaction Data [page 161]

3.3.2.1.1 Transfer of Work Centers from SAP S/4HANA Cloud

You can transfer work centers created or updated in SAP S/4HANA Cloud to SAP Digital Manufacturing Cloud.

Prerequisites

- You have maintained the SAP_COM_0519 communication arrangement in the SAP S/4HANA Cloud SOAP interface for the work center: CO_PPINT_WORK_CENTER_SPRX.
- Ensure that the user that transfers work centers has read authorization to the work center and resource objects in SAP S/4HANA Cloud.

Procedural Steps

1. Log on to the SAP S/4HANA Cloud system.
2. Open the Replicate by Object Selection app.
3. Select Workcenter from the Business Object Type dropdown.
4. Enter your work center in the Work Ctr field.
5. Enter your plant in the Plant field.
7. Choose Replicate.
8. Check logs for the replication status.

You can view the transferred work centers in the Manage Work Centers app. Work center capacity updates in SAP S/4HANA Cloud will result in the corresponding changes SAP Digital Manufacturing Cloud and in addition you can see the capacity category in the Manage Work Centers app. Note that ERP Work Center is set to Yes for the work centers transferred from SAP S/4HANA Cloud.

Related Information

Manage Work Centers

3.3.2.1.2 Transfer of QM Defect Code Groups and Codes from SAP S/4HANA Cloud

You can transfer Quality Management (QM) defect code groups and codes from SAP S/4HANA Cloud to SAP Digital Manufacturing Cloud using the Manage Nonconformance Groups app.

Prerequisites

- You have set up integration with SAP S/4HANA Cloud (see Connecting to SAP S/4HANA Cloud [page 132])
- You have set up the communication arrangement for the Defect Processing Integration (SAP_COM_0153) communication scenario in SAP S/4HANA Cloud.

Procedural Steps

1. In the Manage Nonconformance Groups app, choose Sync QM Groups.
2. Search for the production-relevant QM defect code groups that exist in the connected SAP S/4HANA Cloud system. The selection is restricted to catalog type 9 (Defect types) in SAP S/4HANA Cloud. Only released code groups are displayed and can be transferred. You can check which QM code groups have been previously transferred by selecting Yes in the Previously Synched dropdown. If you need to transfer new QM code groups, select Yes in the Previously Synched dropdown.
3. Select one or more QM code groups and choose Sync.

The selected QM code groups are transferred to SAP Digital Manufacturing Cloud. QM defect groups and codes transferred from SAP S/4HANA Cloud are marked with ERP Group and ERP Code indicators set to Yes in the Manage Nonconformance Groups and Manage Nonconformance Codes apps. Note that a nonconformance code originated from SAP S/4HANA Cloud is represented by the concatenated name (QM defect code and code group).
When you log a nonconformance code originated from SAP S/4HANA Cloud in the POD, it is automatically transferred to SAP S/4HANA Cloud and a generic defect record is created.

**Related Information**

Defect Processing Integration (SAP_COM_0153) [page 150]
Destination S4H_ODATA_INTEGRATION [page 153]
Manage Nonconformance Groups
Manage Nonconformance Codes

### 3.3.2.1.3 Current Version Dependencies

You can change the current version of different master data objects, such as BOMs, routings, and materials. Note that when you change the current version of a BOM, routing, or a material, the dependencies between these objects will also change.

### 3.3.2.1.4 Updating a Master Recipe

You can update master recipes in SAP S/4HANA Cloud.

When master recipe data is updated in SAP S/4HANA Cloud, the data is updated according to the following rules:

1. All the master recipe fields that have been mapped are updated.
2. All the enrichments done in SAP Digital Manufacturing Cloud for execution (for example, work instructions and data collection attachments) are kept.
3. When a resource is changed on a phase in SAP S/4HANA Cloud, then this resource is updated to a phase in SAP Digital Manufacturing Cloud for execution, but work instructions and data collection attachments are deleted from the phase.
4. When a phase is deleted in SAP S/4HANA Cloud, then the phase, along with its work instructions and data collections, is deleted in SAP Digital Manufacturing Cloud for execution.

### 3.3.2.1.5 Updating and Upversioning a Material

You can update and upversion master materials in SAP S/4HANA Cloud, as well as SAP ERP and SAP S/4HANA.

Changes to the following fields trigger material upversioning:

- Base UOM
- Material UOM
### 3.3.2.1.6 Updating and Upversioning a BOM

You can update and upversion master BOMs in SAP S/4HANA Cloud, as well as SAP ERP and SAP S/4HANA.

A master BOM is downloaded from SAP S/4HANA Cloud to SAP Digital Manufacturing Cloud for execution using an OData call while downloading a master recipe or master routing. A master BOM is downloaded only when at least one component is assigned to the routing or recipe step. The master BOM is downloaded from SAP S/4HANA Cloud using OData protocol using the connection details maintained in the S4H_ODATA_INTEGRATION destination.

Changes to the following fields trigger BOM upversioning:
- Description
- Add Component
- Remove Component
- Change Quantities
- Header Base Quantity
- Component Type
- Component UOM
- Component Scrap %

Changes in all other fields will result in a BOM update only.

### 3.3.2.1.7 Updating and Upversioning a Routing

You can update and upversion master routings in SAP S/4HANA Cloud and SAP S/4HANA.

Changes to the following routing header fields trigger routing upversioning:
- Description
- Adding Operation Activities
- Removing Operation Activities
- Status

Changes to the following routing operation activity fields trigger routing upversioning:
- Description
- Work Center
- Control Key
- Long Text
- Standard Value Keys and Values
- Normal Operation Activity

Changes in all other fields will result in a routing update only.
3.3.2.2 Integration of Transaction Data

SAP Digital Manufacturing Cloud can be integrated with an SAP S/4HANA Cloud system.

Use

You can transfer transaction data between an SAP S/4HANA Cloud system and an SAP Digital Manufacturing Cloud for execution system.

Transaction Data Integration

Transaction data is data that’s created during an event or operation. It is assigned to certain master data, for example the produced quantity of a particular product included in an individual order, and it changes with each transaction.

You can integrate the following transaction data with SAP S/4HANA Cloud:

<table>
<thead>
<tr>
<th>Transaction Data for outbound integration from SAP Digital Manufacturing Cloud to S/4HANA Cloud</th>
<th>SAP Digital Manufacturing Cloud for Execution</th>
<th>SAP S/4HANA Cloud</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quantity Confirmation</td>
<td>Quantity Confirmation</td>
<td></td>
</tr>
<tr>
<td>Material Consumption (Goods Issue)</td>
<td>Material Consumption (Goods Issue)</td>
<td></td>
</tr>
<tr>
<td>Goods Receipt</td>
<td>Goods Receipt</td>
<td></td>
</tr>
<tr>
<td>Activity Confirmation</td>
<td>Activity Confirmation</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Transaction Data for inbound integration from S/4HANA Cloud to SAP Digital Manufacturing Cloud</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAP S/4HANA Cloud</td>
</tr>
<tr>
<td>Process Order</td>
</tr>
</tbody>
</table>

Prerequisites

- Master data integration has been set up (see Integration of Master Data [page 156]).

Sequence Considerations

1. Transfer the master data.
2. Transfer the process order data.

Implementation Considerations

Some functions may behave differently depending on the SAP S/4HANA Cloud version used for integration with SAP Digital Manufacturing Cloud for execution.

Related Information

Integration of Master Data [page 156]

3.3.2.2.1 Transferring Production Order with PRT Assignment

This section describes how to transfer production order data with PRT assignment from SAP S/4HANA Cloud to SAP Digital Manufacturing Cloud for execution to create or update the corresponding production order record in SAP Digital Manufacturing Cloud for execution.

i Note

Currently, you can only transfer production order with material PRT assignment.

Prerequisites

SAP S/4HANA Cloud

- You have created communication arrangement to transfer production order from SAP S/4HANA Cloud to SAP Digital Manufacturing Cloud. For details, see Manufacturing Execution - Order and Confirmation Integration (SAP_COM_0522) [page 146].
- The material PRT has been transferred from SAP S/4HANA Cloud to SAP Digital Manufacturing Cloud for execution together with the material master data.
- The material PRT has already been assigned to routing operations.

SAP Digital Manufacturing Cloud

- The collaboration link COLLABORATION_PRT_ASSIGNMENT_GET is mapped to the directive ERP_PRT_ASSIGNMENT_GET in the Manage Collaboration Links app.
Procedure

1. Create or update a production order manually in SAP S/4HANA Cloud.
2. Choose the Release Order button to transfer the order to SAP Digital Manufacturing Cloud for execution.
3. Choose Save.
4. Verify the results in the Manage Orders or the Monitor Integration Messages app in SAP Digital Manufacturing Cloud for execution.

3.3.2.2.2 Transfer of Floor Stock Data

Use

You can transfer floor stock data for certain goods movement types from an SAP S/4HANA Cloud system to SAP Digital Manufacturing Cloud. You can select the inventory management mode you want to enable for your plant in the Manage Plants app. Depending on the mode you enabled, the supported goods movement types varies.

i Note

Unlike with the integration to SAP ERP or SAP S/4HANA, no IDocs or SAP Cloud Integration are used for the integration to SAP S/4HANA Cloud. The SAP Digital Manufacturing Cloud system is directly integrated with SAP S/4HANA Cloud.

<table>
<thead>
<tr>
<th>i Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>In SAP S/4HANA Cloud, the filter Print Active need be set as =X(Yes) for output type MMIM_MATDOC_GDSVMVT_ESOA in Output Parameter Determination. The Print via Output Control need be checked for posting the goods movement to SAP Digital Manufacturing Cloud system.</td>
</tr>
</tbody>
</table>

Consolidated Inventory Management Mode

If you have enabled Consolidated inventory management mode, all standard goods movement types in SAP S/4HANA Cloud are supported in SAP Digital Manufacturing Cloud.

Individual Inventory Management Mode

If you have enabled Individual inventory management mode, the following goods movement types are supported.

Inbound integration

Inbound integration messages include floor stock receipt (goods movement type 311).
Outbound integration

Outbound integration messages include:

- Floor Stock Consumption (goods movement type 261)
- Floor Stock Return (goods movement type 312)

The following scenarios are supported:

**Floor Stock Receipt** (replenishment, goods movement type 311)

In your SAP S/4HANA Cloud system, you can use the Post Goods Movement app to trigger goods movement from the central storage location to the production storage location.

The process for floor stock receipt without reservation (goods movement type 311) in SAP Digital Manufacturing Cloud assumes that the received goods are moved from a central warehouse location to a production location, so that they can be used during the production process.

- When you post a transfer of unrestricted-use stock from a central (issuing) storage location to a floor stock (production) storage location in SAP S/4HANA Cloud using the goods movement type 311, the stock data is transferred from SAP S/4HANA Cloud to SAP Digital Manufacturing Cloud via the soap call of communication scenario SAP_COM_0263.
- SAP S/4HANA Cloud triggers the outbound message `MMIM_MATDOC_GDSMVMT_ESOA` to integrate the floor stock to the production storage location in SAP Digital Manufacturing Cloud with Batch Number and Inventory ID created to the new inventory.
The inventory is ready for consumption without reservation in SAP Digital Manufacturing Cloud.

- A floor stock receipt is created for the specified components.

When COLLABORATION_GOODS_ISSUE_CONFIRMATION is triggered, SAP Digital Manufacturing Cloud sends a confirmation to SAP S/4HANA Cloud to report consumed components.

Integration

- SAP S/4HANA Cloud is the system of record for inventory management; SAP Digital Manufacturing Cloud is the system of record for floor stock management.
- A transfer posting in SAP ERP or SAP S/4HANA is used in the same way as a floor stock receipt in SAP Digital Manufacturing Cloud.
- For inventory ID records created in SAP Digital Manufacturing Cloud through the integration, the field ERP Inventory is checked.

Prerequisites

SAP S/4HANA Cloud

- You have created production storage locations for floor stock materials.
- You have set up communication arrangement for SAP_COM_0108 and SAP_COM_0263.
- You have set up a filter for Print Active and the goods movement type 311 in Output Parameter Determination.
- You have created a BOM for the finished good material of the order.

SAP Digital Manufacturing Cloud

- You have created a storage location matching SAP S/4HANA Cloud Storage Location.
- For the production order-specific consumption scenario, you have created or imported shop order data so that components can be pegged.
- You have defined a numbering pattern for the number type floor stock receipt.
- For outbound integration, make sure the following collaboration links are mapped to respective directives in the Manage Collaboration Links app.
  - The link COLLABORATION_GOODS_ISSUE_CONFIRMATION is mapped to the directive GOODS_ISSUE_CONFIRMATION.
  - The link COLLABORATION_GOODS_RECEIPT_CONFIRMATION is mapped to the directive GOODS_RECEIPT_CONFIRMATION.
  - The link COLLABORATION_QUANTITY_CONFIRMATION is mapped to the directive QUANTITY_CONFIRMATION.
  - The link COLLABORATION_BATCH_CHARACTERISTICS is mapped to the directive BATCH_CHARACTERISTICS.
3.3.2.2.2.1 Updating Integration Configuration to Use Floor Stock Data

If you want to use the floor stock integration functionality in SAP Digital Manufacturing Cloud, you need to update certain settings in your configuration integration, as shown here.

Prerequisites

You have made the following configurations to connect SAP Digital Manufacturing Cloud for execution to SAP S/4HANA Cloud:

- Configuring a Service Broker [page 135]
- Creating a Communication User [page 136]
- Creating a Communication System [page 136]
- Creating Communication Arrangements [page 137]
- Creating Destinations [page 152]
- Managing Supported Plants [page 154]
- Defining Operations in SAP S/4HANA Cloud for SAP Digital Manufacturing Cloud for Execution [page 154]

Procedure

1. Go to the SaaS tenant of your system and generate a new service instance and key for Digital Manufacturing Cloud Services. Note down the clientid and clientsecret under the uaa tag.
2. Update the destination configuration for S4H_INTEGRATION_OAUTH.
   - Go to SAP BTP Cockpit, and in the side menu bar, choose Connectivity Destinations.
   - Update the credentials for S4H_INTEGRATION_OAUTH with the clientid and clientsecret noted in above step.
3. Assign the collaboration directive ERP_INV_CLEAR_RESERVATION to the collaboration link COLLABORATION_ERP_INV_CLEAR_RESERVATION for the inventory Return activity.

Results

You can now use the floor stock functionality as described in this chapter.

i Note

If you have already enabled the transfer of floor stock data before the 2008 release, and you want to integrate inbound inventory with batch characteristic values, you need to create a new service broker (while keeping the old service broker you’ve created before) and complete the above procedures again.
3.3.2.2.2 Transfer of Floor Stock Return Data

Use

This function lets you transfer floor stock return data from SAP Digital Manufacturing Cloud to SAP S/4HANA Cloud.

1. In SAP Digital Manufacturing Cloud, you can trigger the floor stock return to a central storage location.
2. The SAP Digital Manufacturing Cloud Collaboration COLLABORATION_ERP_INV_CLEAR_RESERVATION (ERP_INV_CLEAR_RESERVATION) is triggered in SAP Digital Manufacturing Cloud. This initiates the data synchronization to the SAP S/4HANA Cloud system.
3. In the SAP S/4HANA Cloud system, the floor stock is increased in the central storage location according to the return request. The inventory in the production storage location is decreased according to the return request.

The following scenarios are supported:

Process Order-Independent Floor Stock (311) Return (312)

The process below describes the flow of floor stock return in SAP Digital Manufacturing Cloud which will be synchronized to SAP S/4HANA Cloud for process order-independent floor stock.

- The components are returned to the central storage location.
  SAP S/4HANA Cloud posts a goods movement of the type 312, the reversal of a one-step transfer posting.
Integration

- SAP S/4HANA Cloud is the system of record for inventory management; SAP Digital Manufacturing Cloud is the system of record for floor stock management.

Prerequisites

SAP Digital Manufacturing Cloud

- You have received floor stock data from SAP S/4HANA Cloud.

SAP S/4HANA Cloud

Activities

When you decrease the value of the Qty on Hand field for an inventory ID, enter a reason code and choose Save in the Manage Floor Stock app in SAP Digital Manufacturing Cloud. A corresponding message is sent to SAP S/4HANA Cloud to post the corresponding goods movements.

3.3.2.2.3 Batch Characteristics Update

You can update batch characteristic values and synchronize the data from SAP Digital Manufacturing Cloud to SAP S/4HANA Cloud.

Note

At the moment, this function is supported only for process orders.

Prerequisites

SAP S/4HANA Cloud

- Batch-managed materials are created in SAP S/4HANA Cloud and are transferred to SAP Digital Manufacturing Cloud.
- Batch characteristics are assigned to the batch-managed material in SAP S/4HANA Cloud.
**Procedure**

- Update batch characteristic values for the process order you want to work on.
- The system updates the batch characteristics data for respective material in SAP S/4HANA Cloud.

**Related Information**

*Updating Batch Characteristics*

**3.3.2.2.4 Batch Creation**

You can transfer batch number created in SAP Digital Manufacturing Cloud to SAP S/4HANA Cloud.

**Prerequisites**

**SAP S/4HANA Cloud**

- Batch-managed materials are created in SAP S/4HANA Cloud and are transferred to SAP Digital Manufacturing Cloud.

**SAP Digital Manufacturing Cloud**

- The collaboration link `COLLABORATION_BATCH_CREATION` is mapped to the directive `BATCH_CREATION` in the Manage Collaboration Links app.

**Procedure**

- Create a batch number for the process order you want to work on.
- The system triggers a collaboration event and sends the `COLLABORATION_BATCH_CREATION` message to update the batch data for respective material in SAP ERP.

**Related Information**

*Creating Batch Numbers*
### 3.3.2.2.5 Inspection Characteristics Integration (Production Order)

You can transfer an inspection lot (type 03) from SAP S/4HANA Cloud to SAP Digital Manufacturing Cloud for execution.

#### Prerequisites

**SAP S/4HANA Cloud**
- You have maintained the SAP_COM_0522 communication arrangement in the SAP S/4HANA Cloud SOAP interface for the production order: CO_PPINT_MFGORD_EXECT_REQ_OUT_SPRX. For more information, see [Manufacturing Execution - Order and Confirmation Integration (SAP_COM_0522)](###) [page 146].
- The inspection lot (type 03) has been created and assigned inspection characteristics.
- The inspection lot has been assigned to the production order.

#### Procedure

Release the production order in SAP S/4HANA Cloud, and the inspection characteristics are downloaded to SAP Digital Manufacturing Cloud for execution.

#### Related Information

[Inspection Results Recording (Production Order)](###) [page 170]

### 3.3.2.2.6 Inspection Results Recording (Production Order)

You can record inspection results and synchronize the data from SAP Digital Manufacturing Cloud for execution to SAP S/4HANA Cloud.

#### Prerequisites

**SAP S/4HANA Cloud**
- The inspection lot (type 03) has been created and assigned inspection characteristics.
- The inspection lot has been assigned to the production order.
• The base sample quantity must be set to 1.
• You have maintained the SAP_COM_0318 communication arrangement in the SAP S/4HANA Cloud. For more information, see Quality Inspection Process Integration (SAP_COM_0318) [page 150].

SAP Digital Manufacturing Cloud
• The collaboration link COLLABORATION_INSPECTION_LOT is mapped to the directive INSPECTION_LOT in the Manage Collaboration Links app.

Procedure

1. In the Work Center POD, record inspection results for the order you want to work on.
2. Complete an operation activity of the order. The system triggers a collaboration event and sends the COLLABORATION_INSPECTION_LOT message to update the inspection characteristics data for respective order in SAP S/4HANA Cloud.

Related Information

Inspection Characteristics Integration (Production Order) [page 170]

3.3.2.3 Field Mapping for the Integration to SAP S/4HANA Cloud

The fields created in SAP S/4HANA Cloud correspond to certain fields of SAP Digital Manufacturing Cloud for execution.

<table>
<thead>
<tr>
<th>SAP S/4HANA Cloud Field</th>
<th>SAP Digital Manufacturing Cloud for Execution Field</th>
<th>Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>productInternalID</td>
<td>material</td>
<td>N/A</td>
</tr>
<tr>
<td>baseMeasureUnitCode</td>
<td>unitOfMeasure</td>
<td>N/A</td>
</tr>
<tr>
<td>Every description with a supported languageCode</td>
<td>descriptions</td>
<td>Only supported language codes will be displayed.</td>
</tr>
</tbody>
</table>

Note

For the connection to an SAP S/4HANA Cloud system, certain communication arrangements need to be active. For more information, see Integration with SAP ERP or SAP S/4HANA [page 24].

Material and Data Collection Group Mapping (based on SAP_COM_0309 and SAP_COM_0163 Scenarios for DC Groups, and SAP_COM_0009 Scenario for Materials)
<table>
<thead>
<tr>
<th>SAP S/4HANA Cloud Field</th>
<th>SAP Digital Manufacturing Cloud for Execution Field</th>
<th>Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>N/A</td>
<td>version</td>
<td>A</td>
</tr>
<tr>
<td>N/A</td>
<td>currentVersion</td>
<td>TRUE</td>
</tr>
<tr>
<td>N/A</td>
<td>lotSize</td>
<td>one</td>
</tr>
<tr>
<td>N/A</td>
<td>status</td>
<td>releasable</td>
</tr>
<tr>
<td>N/A</td>
<td>quantityRestriction</td>
<td>ANY_NUMBER</td>
</tr>
<tr>
<td>productTypecode/value</td>
<td>materialType</td>
<td>N/A</td>
</tr>
<tr>
<td>supplyPlanning/procurementTypeCode</td>
<td>procurementType</td>
<td>If E→Manufactured.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>If F→Purchased.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>In other cases → Manufactured_purchased.</td>
</tr>
<tr>
<td>supplyPlanning/productRequirementsPlanningResponsibleCode</td>
<td>mrpController</td>
<td>N/A</td>
</tr>
<tr>
<td>plant/plantId</td>
<td>plant</td>
<td>N/A</td>
</tr>
<tr>
<td>N/A</td>
<td>incrementBatchNumber</td>
<td>If product/ batchManagementRequiredIndicator or product/plant/ batchManagementRequiredIndicator or true → ORDER.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>If false → NONE.</td>
</tr>
<tr>
<td>plant/workScheduling/productionInventoryManagedLocationInternalID</td>
<td>productionStorageLocation or putawayStorageLocation</td>
<td>If procurementType = Manufactured → putawayStorageLocation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>In other cases → productionStorageLocation</td>
</tr>
<tr>
<td>N/A</td>
<td>DataCollectionGroup</td>
<td>If Material procurementType = Manufactured or Manufactured_purchased</td>
</tr>
<tr>
<td>N/A</td>
<td>DataCollectionGroup/status</td>
<td>releasable</td>
</tr>
<tr>
<td>N/A</td>
<td>DataCollectionGroup/plant</td>
<td>N/A</td>
</tr>
<tr>
<td>N/A</td>
<td>DataCollectionGroup/version</td>
<td>A</td>
</tr>
<tr>
<td>SAP S/4HANA Cloud Field</td>
<td>SAP Digital Manufacturing Cloud for Execution Field</td>
<td>Conditions</td>
</tr>
<tr>
<td>--------------------------</td>
<td>-----------------------------------------------</td>
<td>-------------</td>
</tr>
<tr>
<td>N/A</td>
<td>DataCollectionGroup/currentVersion</td>
<td>true</td>
</tr>
<tr>
<td>API_CLFN_PRODUCT_SRV/A_ClfnClassForKeyDate/Class</td>
<td>DataCollectionGroup/dcGroup</td>
<td>N/A</td>
</tr>
<tr>
<td>API_CLFN_PRODUCT_SRV/A_ClfnClassForKeyDate/ClassTypeName</td>
<td>DataCollectionGroup/description</td>
<td>dcGroup</td>
</tr>
<tr>
<td>Not developed yet.</td>
<td>DataCollectionGroup.attachedPoints[0].material</td>
<td>material</td>
</tr>
<tr>
<td>API_CLFN_CHARACTERISTIC_SRV/A_ClfnCharacteristicForKeyDate/Characteristic</td>
<td>DataCollectionGroup.dcParameters[].parameterName</td>
<td>N/A</td>
</tr>
<tr>
<td>API_CLFN_CHARACTERISTIC_SRV/A_ClfnCharacteristicForKeyDate/CharcDescription</td>
<td>DataCollectionGroup.dcParameters[].description</td>
<td>If En localization not null.</td>
</tr>
<tr>
<td>API_CLFN_CHARACTERISTIC_SRV/A_ClfnCharacteristicForKeyDate/CharcDataType</td>
<td>DataCollectionGroup.dcParameters[].dcParameterType</td>
<td>TEXT</td>
</tr>
<tr>
<td>N/A</td>
<td>DataCollectionGroup.dcParameters[].sequence</td>
<td>N/A</td>
</tr>
<tr>
<td>product/class</td>
<td>material/inventoryDataType</td>
<td>If product/classType = 023 and material/procurement_type = Purchased or Manufactured_purchased.</td>
</tr>
<tr>
<td>material/plant</td>
<td>DataType/plant</td>
<td>N/A</td>
</tr>
<tr>
<td>N/A</td>
<td>DataType/category</td>
<td>N/A</td>
</tr>
<tr>
<td>product/class/Class</td>
<td>DataType/dataType (datatype name)</td>
<td>N/A</td>
</tr>
<tr>
<td>characteristic</td>
<td>DataField</td>
<td>N/A</td>
</tr>
<tr>
<td>characteristic/EntryIsRequired</td>
<td>DataField/Required</td>
<td>N/A</td>
</tr>
<tr>
<td>material/plant</td>
<td>DataField/Plant</td>
<td>N/A</td>
</tr>
<tr>
<td>SAP S/4HANA Cloud Field</td>
<td>SAP Digital Manufacturing Cloud for Execution Field</td>
<td>Conditions</td>
</tr>
<tr>
<td>-------------------------</td>
<td>--------------------------------------------------</td>
<td>-------------</td>
</tr>
<tr>
<td>characteristic/characteristic (name)</td>
<td>DataField/fieldName</td>
<td>N/A</td>
</tr>
<tr>
<td>characteristic/CharcDataType</td>
<td>DataField/type</td>
<td>N/A</td>
</tr>
<tr>
<td>characteristic/CharcStatus</td>
<td>DataField/status</td>
<td>N/A</td>
</tr>
<tr>
<td>characteristic/ CharcDescription</td>
<td>DataField/description</td>
<td>If language code is set to EN.</td>
</tr>
<tr>
<td>characteristic/ CharcDescription</td>
<td>DataField/fieldLabel</td>
<td>If language code is set to EN.</td>
</tr>
</tbody>
</table>
| characteristic/CharcDataType | DataField/type | If NUM → FieldType/NUMBER.  
If CHAR → FieldType/TEXT.  
If DATE → FieldType/DATE.  
If Default → FieldType.TEXATAREA. |

**Process Order SOAP Message (based on SAP_COM_0522 Scenario ID)**

<table>
<thead>
<tr>
<th>SAP S/4HANA Cloud Field</th>
<th>SAP Digital Manufacturing Cloud for Execution Field</th>
</tr>
</thead>
<tbody>
<tr>
<td>ManufacturingOrder</td>
<td></td>
</tr>
</tbody>
</table>
• Shop Order  
• BOM (with the type *Order*)  
• Recipe (with the type *Order*)  
• Phase (with the type *Operation Activity*)  
• Data Collection Groups |

**Master Recipe SOAP Message (based on SAP_COM_0519 Scenario ID)**

<table>
<thead>
<tr>
<th>SAP S/4HANA Cloud Field</th>
<th>SAP Digital Manufacturing Cloud for Execution Field</th>
</tr>
</thead>
<tbody>
<tr>
<td>BillOfOperations</td>
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</tr>
</tbody>
</table>
• Recipe (with the type *Production*)  
• Phase (Operation Activity)  
• Data Collection Groups |

**Order Recipe Mapping**

<table>
<thead>
<tr>
<th>SAP S/4HANA Cloud Field</th>
<th>SAP Digital Manufacturing Cloud for Execution Field</th>
<th>Conditions</th>
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<tbody>
<tr>
<td>N/A</td>
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<tr>
<td>/n0:ManufacturingOrderExecuteRequest/ManufacturingOrder/ProductionPlant</td>
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<tr>
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<td>/n0:ManufacturingOrderExecuteRequest/ManufacturingOrder/ManufacturingOrderActivityNetworkElement/n1:WorkCenter</td>
<td>/routingSteps/workCenter</td>
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<td>/n0:ManufacturingOrderExecuteRequest/ ManufacturingOrder/ActivityNetworkElement/n1:</td>
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<td>ManufacturingOrderComponent/ Material/</td>
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<td>/n0:ManufacturingOrderExecuteRequest/ ManufacturingOrder/ActivityNetworkElement/Material</td>
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<td>SAP S/4HANA Cloud Field</td>
<td>SAP Digital Manufacturing Cloud for Execution Field</td>
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<tr>
<td>N/A</td>
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<td>10 based counter. Sequence in the order BOM.</td>
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<tr>
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<td>/routingSteps/routingStepComponentList/sequence</td>
<td>10 based counter</td>
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<td>The ID of the next step.</td>
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```xml
/_n0:ManufacturingOrderExecuteRequest/_ManufacturingOrder/_ManufacturingOrderActivityNetworkElement/_n1:ManufacturingOrderSequence-_n0:ManufacturingOrderExecuteRequest/_ManufacturingOrder/_ManufacturingOrderActivityNetworkElement/_n1:ManufacturingOrderOperation
```

```xml
/_n0:ManufacturingOrderExecuteRequest/_ManufacturingOrder/_ManufacturingOrderActivityNetworkElement/_n1:ManufacturingOrderOperationText
```

### Shop Order Mapping

<table>
<thead>
<tr>
<th>SAP S/4HANA Cloud Field</th>
<th>SAP Digital Manufacturing Cloud for Execution Field</th>
<th>Conditions</th>
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</thead>
<tbody>
<tr>
<td>/</td>
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```xml
/_n0:ManufacturingOrderExecuteRequest/_ManufacturingOrder/ProductionPlant
```

```xml
/_n0:ManufacturingOrderExecuteRequest/_ManufacturingOrder
```

```xml
/_shopOrder
```

```xml
/_n0:ManufacturingOrderExecuteRequest/_ManufacturingOrder
```
<table>
<thead>
<tr>
<th>SAP S/4HANA Cloud Field</th>
<th>SAP Digital Manufacturing Cloud for Execution Field</th>
<th>Conditions</th>
</tr>
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<tbody>
<tr>
<td>N/A</td>
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<td>/routing/plant</td>
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</tr>
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<td>SAP S/4HANA Cloud Field</td>
<td>SAP Digital Manufacturing Cloud for Execution Field</td>
<td>Conditions</td>
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<td>/</td>
<td>/bom/bom</td>
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<tr>
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<td>SAP S/4HANA Cloud Field</td>
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<td>Conditions</td>
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<tr>
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Order BOM Mapping for the BOM Header

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<th>SAP S/4HANA Cloud Field</th>
<th>SAP Digital Manufacturing Cloud for Execution Field</th>
<th>Conditions</th>
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<tbody>
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<td>/bom</td>
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Order BOM Mapping for the BOM Component

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<tbody>
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<tr>
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<td>BillOfMaterialVariantUsage-/</td>
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<td>n0:ManufacturingOrderExecuteRequest/ManufacturingOrder/</td>
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Order Mapping for the Data Collection Group

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### Order Data Collection Group Mapping for the Data Collection Parameter

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### Order Data Collection Group Mapping for the Data Collection Group Attachment Point

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**Master Recipe Mapping**

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**Master Recipe Operation Activity Mapping**

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<tr>
<td></td>
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<tr>
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<td>BillOfOperations/</td>
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</tr>
<tr>
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<td>BillOfOperationsHeader/</td>
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</tr>
<tr>
<td></td>
<td>n1:BillOfOperationsPlant</td>
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| /                       | /operation                                        | N/A         |
|                         |                                                   |             |
|                          | n0:ManufacturingMasterRecipeIn                   |             |
|                          | formationMessage/                                |             |
|                          | BillOfOperations/                                |             |
|                          | BillOfOperationsGroup/-                          |             |
|                          | n0:ManufacturingMasterRecipeIn                   |             |
|                          | formationMessage/                                |             |
|                          | BillOfOperations/                                |             |
|                          | BillOfOperationsVariant/-                        |             |
|                          | n0:ManufacturingMasterRecipeIn                   |             |
|                          | formationMessage/                                |             |
|                          | BillOfOperations/                                |             |
|                          | BillOfOperationsActivityNetwork                 |             |
|                          | kElement/                                        |             |
|                          | BillOfOperationsActivityNetwork                 |             |
|                          | kElementTimeSlice/                               |             |
|                          | Operation                                        |             |

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|                         |                                                   |             |
| N/A                     | /currentVersion                                   | Default True|
|                         |                                                   |             |
| N/A                     | /type                                             | Default NORMAL_OPERATION |

---

SAP Digital Manufacturing Cloud Integration Guide

Manufacturing Execution Integration
### Master Recipe Data Collection Group Mapping

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<th>SAP Digital Manufacturing Cloud for Execution</th>
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<td>SAP Digital Manufacturing Cloud for Execution</td>
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</tr>
<tr>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------</td>
<td>-----------</td>
</tr>
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Master Recipe Data Collection Group Attachment Point Mapping

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Master Recipe Standard Value Key Mapping for a Standard Value Group

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### Master Recipe Standard Value Key Mapping for a Standard Value Target

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<td>/n0:ManufacturingMasterRecipeIn</td>
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<tr>
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<td>fomationMessage/</td>
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<td>kElementTimeSlice/</td>
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<td>WorkCenterFormulaParam1/</td>
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<td>WorkCenterStandardWorkQty</td>
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### Master Recipe BOM Header oData Mapping

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### Master Recipe BOM Component oData Mapping

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### SAP S/4HANA Cloud Field | SAP Digital Manufacturing Cloud for Execution Field | Conditions
---|---|---
N/A | assemblyQtyAsRequired | TRUE
N/A | bomComponentType | • CO_PRODUCT if MaterialCoProduct
• BY_PRODUCT if BillOfMaterialItemQuantity is less than 0
• Or else NORMAL

BillOfMaterialComponent, Plant material | Material entity found by search fields

### Control Key Mapping

| SAP S/4HANA Cloud Field | SAP Digital Manufacturing Cloud for Execution Field | Conditions |
---|---|---
/ | /controlKey | N/A
n0:ManufacturingOrderExecuteRequest/ManufacturingOrder/ManufacturingOrderActivityNetworkElement/n1:OperationControlProfile/@n1:OperationControlKey |
N/A | /gi | N/A

### Statuses Mapping

| SAP S/4HANA Cloud Field | SAP Digital Manufacturing Cloud for Execution Field | Meaning |
---|---|---
DLV | I0012 | Delivered |
TECO | I0045 | Technically completed |
DLFL | I0076 | Deletion Flag |
### 3.3.2.3.1 Mapping of Tolerance-Related Fields of the Order Header Material

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### 3.3.2.3.2 Mapping Alternate BOM Components

BOM components that belong to the same alternate group in SAP S/4HANA Cloud are mapped as alternate components for each other in SAP Digital Manufacturing Cloud for execution.

**Master BOM Component**

**SAP S/4HANA Cloud**

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<th>DME Field</th>
<th>Default Value</th>
<th>SAP S/4HANA Cloud Field</th>
</tr>
</thead>
<tbody>
<tr>
<td>alternativeItemGroup</td>
<td>AlternativeItemGroup</td>
<td></td>
</tr>
<tr>
<td>ERP Alternate Item Group</td>
<td>Alternates_enabled</td>
<td>TRUE</td>
</tr>
<tr>
<td>Alternates Enabled</td>
<td>alternativeItemGroup</td>
<td>AlternativeItemPriority</td>
</tr>
<tr>
<td>Alternates Priority</td>
<td>alternativeItemGroup</td>
<td>BillOfMaterialComponent</td>
</tr>
</tbody>
</table>
### 3.3.2.3.3  Mapping for a Standard Value Key (SVK)

The fields created in SAP S/4HANA Cloud correspond to certain fields of SAP Digital Manufacturing Cloud for execution.

#### Standard Value Key Mapping for an SV Group

<table>
<thead>
<tr>
<th>SAP Digital Manufacturing Cloud for Execution Field</th>
<th>SAP S/4HANA Cloud</th>
</tr>
</thead>
<tbody>
<tr>
<td>.plant</td>
<td></td>
</tr>
<tr>
<td></td>
<td>n0:ManufacturingMasterRecipeInformationMessage</td>
</tr>
<tr>
<td></td>
<td>/BillOfOperations/BillOfOperationsHeader/</td>
</tr>
<tr>
<td></td>
<td>n1:BillOfOperationsPlant</td>
</tr>
<tr>
<td>.standardValKey</td>
<td></td>
</tr>
<tr>
<td></td>
<td>n0:ManufacturingMasterRecipeInformationMessage</td>
</tr>
<tr>
<td></td>
<td>/BillOfOperations/</td>
</tr>
<tr>
<td></td>
<td>BillOfOperationsActivityNetworkElement/</td>
</tr>
<tr>
<td></td>
<td>BillOfOperationsActivityNetworkElementTimeSlice/</td>
</tr>
<tr>
<td></td>
<td>StandardWorkFormulaParamGroup/</td>
</tr>
<tr>
<td></td>
<td>@StandardWorkFormulaParamGroupID</td>
</tr>
<tr>
<td>StandardValue</td>
<td></td>
</tr>
<tr>
<td>.standardVal</td>
<td></td>
</tr>
<tr>
<td></td>
<td>n0:ManufacturingMasterRecipeInformationMessage</td>
</tr>
<tr>
<td></td>
<td>/BillOfOperations/</td>
</tr>
<tr>
<td></td>
<td>BillOfOperationsActivityNetworkElement/</td>
</tr>
<tr>
<td></td>
<td>BillOfOperationsActivityNetworkElementTimeSlice/</td>
</tr>
<tr>
<td></td>
<td>StandardWorkFormulaParamGroup/</td>
</tr>
<tr>
<td></td>
<td>WorkCenterFormulaParam1/</td>
</tr>
<tr>
<td></td>
<td>@WorkCenterFormulaParamID</td>
</tr>
</tbody>
</table>
### 3.3.3 Restrictions and Limitations

This page lists the current restrictions and limitations of SAP S/4HANA Cloud integration.

- **Goods Issue**
  The goods issue from Central Storage Location can't be triggered from SAP Digital Manufacturing Cloud. It is currently triggered from SAP S/4HANA Cloud.
• **Goods Movement**  
The goods movement from Production Storage Location and between Production Storage Locations can’t be triggered from integrated SAP S/4HANA Cloud system. It is currently triggered from SAP Digital Manufacturing Cloud only.

• **Material-Level Batch Management**  
Material level is the only supported batch level. The batch number is unique in all plants in connection with the material. Plant level and client level batch management are currently not available.

  *Note*  
You must choose the material level as the batch level in SAP S/4HANA Cloud. Otherwise, you might encounter inbound inventory transfer issues from SAP S/4HANA Cloud to SAP Digital Manufacturing Cloud.

• **Long Material Number and Batch**  
Long material number is not supported in all batch scenarios including inventory download with batch number, batch creation, batch characteristic update and goods receipt with batch number.

### 3.4 Integration with SAP Asset Intelligence Network

You can connect SAP Digital Manufacturing Cloud for execution to the SAP Asset Intelligence Network.

The aim of SAP Asset Intelligence Network is to maintain a global registry of equipment that uses common definitions. These common definitions are then shared between multiple business partners, such as manufacturers or original equipment manufacturers (OEMs), operators, or service providers to deliver collaborative business models.

At the core of the network is the SAP Cloud Platform with IoT application services. SAP and partners within the network, collaborate on solutions for connected asset lifecycle management, track and trace, and IoT for the process industry.

**Integration with SAP Asset Intelligence Network**

<table>
<thead>
<tr>
<th>SAP AIN</th>
<th>SAP Digital Manufacturing Cloud for Execution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item of Equipment</td>
<td>SFC Number</td>
</tr>
</tbody>
</table>

**Prerequisites**

• You have subscribed to both SAP Digital Manufacturing Cloud for execution and SAP Asset Intelligence Network.

• You have subscribed and received client credentials. For information about generating the required service key, see *Accessing APIs of SAP Intelligent Asset Management Solutions* on the SAP Help Portal.
Steps

   1. To create destinations for SAP Asset Intelligence Network under the customer SaaS tenant, go to the
      SAP Cloud Platform Cockpit (of Digital Manufacturing Cloud for execution) ➤ Connectivity ➤
      Destinations ➤.
   2. Set the destination name to AIN_DESTINATION_OAUTH.
   3. Under Type, select HTTP.
   4. Under AIN Application URL, set URL from SAP Asset Intelligence Network DevOps.
   5. Under Internet, set Proxy Type.
   7. Under Client ID, set clientid from SAP Asset Intelligence Network DevOps (see Client ID
      information in Accessing APIs of SAP Intelligent Asset Management Solutions on the SAP Help Portal).
   8. Under Client Secret, set clientsecret from SAP Asset Intelligence Network DevOps (see Client
      Secret information in Accessing APIs of SAP Intelligent Asset Management Solutions on the SAP Help Portal).
   9. Under Token Service URL, set tokenurl from SAP Asset Intelligence Network DevOps (see Token URL
      information in Accessing APIs of SAP Intelligent Asset Management Solutions on the SAP Help Portal).
   10. Check the availability of the destination connection.

Example


2. Verify that the description name of the Business Partner in the SAP S/4HANA system corresponds to the
   name of the Company Profile maintained in the SAP Asset Intelligence Network system.

i Note

There are two roles involved in the integration between SAP Asset Intelligence Network and SAP Digital
Manufacturing Cloud: Manufacturer and Operator.

Manufacturer: This role is assigned to the credential/service key customer configured in the
destination of the SAP Cloud Platform Cockpit. It can't be configured when setting up the integration
between SAP Asset Intelligence Network and SAP Digital Manufacturing Cloud. For more information,
see Creating a Service Key in SAP Cloud Platform Cockpit on the SAP Help Portal.

Operator: This role indicates the buyer or operator of the equipment produced in SAP Digital
Manufacturing Cloud. Operators can be maintained in the company profile in SAP Asset Intelligence
Network. For more information, see Managing Company Profile in the Application Help for SAP Asset
Intelligence Network on the SAP Help Portal.

The SAP S/4HANA business partner corresponds to the operator in SAP Asset Intelligence Network.
The description name of the SAP S/4HANA business partner must be identical to the operator
maintained in the company profile in SAP Asset Intelligence Network, as SAP Asset Intelligence
Network uses the company profile name as a key, not the customer number in SAP S/4HANA.

1. In SAP Asset Intelligence Network, call up the Company Profile app.
2. Note down the name of the operator maintained in the Company Profile. This is a pre-requisite for the integration setup. For example, if the description of the company profile is ABC Corporation, the same name needs to be maintained for the Business Partner in the SAP S/4HANA system.

3. Create or edit the business partner in SAP S/4HANA as required. For more information, see SAP Business Partner in the Application Help for SAP S/4HANA on the SAP Help Portal.

3. Configure the SAP Asset Intelligence Network.

1. Create and Publish the model in SAP Asset Intelligence Network based on your business requirements. For more information on creating and publishing models, see Creating a Model in the Application Help for SAP Predictive Maintenance and Service, cloud edition on the SAP Help Portal.

2. In SAP AIN, call up the Models app and select the model to create the external ID.

3. Click the external ID and select the system name, object type. Then type the external id as required, for example: DMCAINFG126.

   **i Note**

   Creating the external ID should be based on your business requirements. It needs to be maintained in SAP Digital Manufacturing Cloud by the shop floor team.


1. Go to the Models app SAP Asset Intelligence Network, select the model, and note down the external ID created in Step 3. The external ID of the model in SAP Asset Intelligence Network has to be maintained in the field AIN Model External ID of the material for equipment integration. For more information, see Manage Materials.

2. Choose Manage Collaboration Links.

3. Click the collaboration link, for example: AIN_COLLABORATION_SFC_DONE.

4. Add or maintain the connection between collaboration links and collaboration directives.

<table>
<thead>
<tr>
<th>Collaboration Link</th>
<th>Collaboration Directive</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AIN_COLLABORATION_SFC_DONE</td>
<td>AIN_CREATE_EQUIPMENT_POST</td>
<td>To create an outbound transaction for equipment in SAP Asset Intelligence Network when an SFC is done.</td>
</tr>
</tbody>
</table>

   **i Note**

   The equipment will be created in SAP Asset Intelligence Network when an SFC is produced in SAP Digital Manufacturing Cloud.

### 3.4.1 Verification and Troubleshooting for SAP Asset Intelligence Network Integration

This topic shows how to verify if your integration setup was successful and has information on how to solve certain issues.

**Integration with SAP Asset Intelligence Network**

**Prerequisites**
SAP ERP System

- Material master records for the produced material and all components have been created manually in SAP Asset Intelligence Network.
- Material master records for the produced material and all the components have been transferred to the SAP Digital Manufacturing Cloud for execution system.
- The respective production order has been transferred to the SAP Digital Manufacturing Cloud for execution system including the customer number.

SAP Asset Intelligence Network System

- The equipment model has been published and assigned an external ID in SAP Asset Intelligence Network.
- The equipment model has been assigned as an external ID for this model in SAP Asset Intelligence Network. For more information, see SAP Asset Intelligence Network Models and Creating a Model on the SAP Help Portal at http://help.sap.com.
- The respective production order has been transferred to the SAP Digital Manufacturing Cloud for execution system, including the customer number.

SAP Digital Manufacturing Cloud for Execution System

- The material master is integrated from ERP to SAP Digital Manufacturing Cloud for execution.
- The external ID of the SAP Asset Intelligence Network model has been maintained in the material master manually.
- The collaboration link and directive have been configured.
  Collaboration directive: AINCREATEEQUIPMENTPOST
  Collaboration link: AINCOLLABORATIONSFCDONE
- The order has been released in SAP Digital Manufacturing Cloud for execution.
- An SFC number belonging to the production order is completed at the last routing step.

3.5 Integration with Resource Orchestration

In addition to using Resource Orchestration with SAP Digital Manufacturing Cloud for execution, you can also integrate it with on-premise SAP Manufacturing Execution. This integration lets the production supervisor to create schedules using the Resource Orchestration tool in SAP Digital Manufacturing Cloud for execution and send them to SAP Manufacturing Execution on-premise.

SAP Manufacturing Execution on-premise integration with Resource Orchestration supports the following scenarios:

- Scheduling of orders that are created in the SAP Manufacturing Execution on-premise system using Resource Orchestration where the supervisor can dispatch operations to resources. The scheduled dates and the scheduled resources from Resource Orchestration are then sent to the SAP Manufacturing Execution on-premise system. See Integrating SAP Manufacturing Execution On-Premise to Resource Orchestration (Inbound) [page 203]
- Orders released from Resource Orchestration trigger the SAP Manufacturing Execution on-premise system to create an SFC. Now, the supervisor can release orders from Resource Orchestration. Further execution is carried out in the SAP Manufacturing Execution System. See Integrating Resource Orchestration to SAP Manufacturing Execution On-Premise (Outbound) [page 203]
3.5.1 Integrating SAP Manufacturing Execution On-Premise to Resource Orchestration (Inbound)

Context

After you get the email from SAP confirming that provisioning is complete, create a ticket to request data needed for data replication. After receiving the data, define plants in your system and install and configure SDI (see Setting up the Connection to SAP Digital Manufacturing Cloud [page 271]). After you have configured SDI, create a second ticket with SAP to request data replication.

Note that steps for configuring SDI often change and vary depending on the database source, such as Oracle or SAP S/4HANA. For more information, see Set Up Data Provisioning Monitoring and HANA Smart Data Integration.

For the initial setup, create a remote source using SDI_USER.

3.5.2 Integrating Resource Orchestration to SAP Manufacturing Execution On-Premise (Outbound)

Context

You can connect Resource Orchestration to SAP Manufacturing Execution On-Premise, by following these steps.

Procedure

1. Install and Configure Cloud Connector

   For information on installing and configuring the cloud connector, see Setting Up the Cloud Connector [page 13].
2. Configure SAP Cloud Integration to Connect with SAP Digital Manufacturing Cloud for execution.

2. Add User Credentials with the Name: CF_AUTH, the User: <the clientid of uaa>, and the Password: <the clientsecret of uaa>.

**Note**

To get the clientid and clientsecret, go to SAP Cloud Platform Cockpit (of SAP Digital Manufacturing Cloud for execution) > Services > Service Instance > Service Key, the clientid and clientsecret are under the uaa tag.

3. Add User Credentials with the Name: PD_DEPLOYER_USER and the User: <the SAP Cloud Integration user>, Password: <the password of SAP Cloud Integration user>.

4. To search for the Digital Manufacturing Execution Integration package in the content hub, go to Discover.


6. Choose Copy to copy the Digital Manufacturing Execution Integration package to the customer tenant.

7. To set the following parameters in Initial Parameters go to Design > Digital Manufacturing Execution Integration package > Artifacts > Initial Parameters > Action > Configure.

<table>
<thead>
<tr>
<th>Parameter Name</th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>PID</td>
<td>DME_GENERIC_PROCESSING_00</td>
<td></td>
</tr>
<tr>
<td>TENANT_CREDENTIALS</td>
<td>The User Credential created in SAP Cloud Integration Security Material.</td>
<td>PD_DEPLOYER_USER</td>
</tr>
<tr>
<td>TENANT_URL</td>
<td>SAP Cloud Integration Tenant Management URL used for access from the Eclipse plugin. Used during content deployment (iflow).</td>
<td>Refer to the email the customer received after confirming successful SAP Cloud Integration tenant provisioning. Add the Management URL (accessed from the Eclipse plugin) included in the CPI successful provisioning email.</td>
</tr>
</tbody>
</table>

**Example**

https://xxxx-tmn.avt.eu1.hana.ondemand.com
<table>
<thead>
<tr>
<th>Parameter Name</th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMMON_DME_SB_URL</td>
<td>Service Broker URL for JWT token fetching.</td>
<td>Go to [SAP Cloud Platform Cockpit](SAP Digital Manufacturing Cloud for execution) &gt; Services &gt; Service Instances &gt; Service Key. The URL can be found by choosing the tag <code>url</code>, under the tag <code>uaa</code>.</td>
</tr>
<tr>
<td>COMMON_DME_INT_URL</td>
<td>The application routers URL of backend integration <code>ms</code> application.</td>
<td>Go to [SAP Cloud Platform Cockpit](SAP Digital Manufacturing Cloud for execution) &gt; Subaccounts, enter the customer tenant and select the data center from the third node of the API Endpoint.</td>
</tr>
<tr>
<td><strong>Example</strong></td>
<td></td>
<td><a href="https://api.cf.eu10.hana.ondemand.com">https://api.cf.eu10.hana.ondemand.com</a></td>
</tr>
<tr>
<td></td>
<td>The data center is eu10.</td>
<td>Use the data center value to replace <code>&lt;data center&gt;</code> of the following URL: <a href="https://dm-prod-prod-dme-integration-ms.cfapps">https://dm-prod-prod-dme-integration-ms.cfapps</a>.&lt;data center&gt;.hana.ondemand.com</td>
</tr>
<tr>
<td>COMMON_DMC_REQ_M_E_OP_SECURITY_MATERIAL_LIST</td>
<td>The list to map the plant and technical user credential for integration. Format: <code>&lt;plant1&gt;=&lt;user credential1&gt;;&lt;plant2&gt;=&lt;user credential2&gt;</code></td>
<td><strong>Example</strong> SAP=ME_CREDENTIAL1; 1000=ME_CREDENTIAL2</td>
</tr>
</tbody>
</table>
### Parameter Name

| COMMON_DMC_REO_M_E_OP_URL_LIST |

**Description**

The list to map the plant and the URL of WSDL. Format:

<plant1>=<url1 of WSDL with virtual host and port>;<plant2>=<url2 of WSDL with virtual host and port>

---

**Example**

- SAP=http://vhreo:50000/manufacturing-papiservices/ShopOrderServiceWSService
- 1000=http://vhreo2:51038/manufacturing-papiservices/ShopOrderServiceWSService

---

**Note**

Use http for the virtual address.

To retrieve the WSDL URL from SAP ME system, go to SAP NetWeaver Administrator ➔ Configuration ➔ Connectivity ➔ Single Service Administration ➔ Search for ShopOrderServiceWS. Choose WSDLs tag to get the URL of WSDL. Use the virtual host and port number from cloud connector.

---

8. **Save and deploy Initial Parameters.**

9. If multiple cloud connectors are configured for the same SAP Cloud Integration tenant, then you should configure the location ID from the cloud connector for the following artifacts:

- REO Update ShopOrder Schedule process request
- REO Release ShopOrder Schedule process request

10. **Choose Actions ➔ Update** for the selected artifact and enter the following fields:

- Type
- ENDPOINT_ID
- LOCATION_ID

11. After you have entered the fields, save and deploy these artifacts.

12. Deploy the rest of the artifacts.

- General Message Processor
- REO - Release ShopOrder Schedule - Service
- REO - Update ShopOrder Schedule - Service
- REO - Update ShopOrder Schedule Splitter

13. Go to Overview ➔ Manage Integration Content to verify that all the artifacts are started.

---

3. **Configure SAP Cloud Platform of SAP Digital Manufacturing Cloud for execution**

   1. To create destinations for integration, under the corresponding tenant go to SAP Cloud Platform Cockpit ➔ Connectivity ➔ Destinations ➔
2. Create the destination CPI_DESTINATION_IFLMAP.
3. Under **Type of Destination**, for CPI_DESTINATION_IFLMAP select **HTTP**.
4. Enter the CPI Runtime URL in **URL**.
5. Select **Internet** as **Proxy Type**.
6. Select **BasicAuthentication** as **Authentication**.
7. Enter the **User** and **Password**.
8. Create the destination CPI_DESTINATION_TMN for the front-end process.
9. Under **Type of Destination** for CPI_DESTINATION_TMN, select **HTTP**.
10. Under **URL**, enter the URL for CPI Management URL.
11. Under **Proxy Type**, select **Internet**.
12. Under **Authentication**, select **BasicAuthentication**.
13. Enter the **User** and **Password**.
14. The destination data is used by SAP Digital Manufacturing Cloud for execution to find the specific SAP Cloud Integration for integration.

4. Configure SAP Digital Manufacturing Cloud for execution

1. In the SAP Digital Manufacturing Cloud Fiori Launchpad, choose **Execution**.
2. Choose **Manage Plants**.
3. Add or maintain the SAP S/4HANA plant that needs to be supported with SAP Digital Manufacturing Cloud for execution in the *Main* section of the **Manage Plants** app.

<table>
<thead>
<tr>
<th>Properties</th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plant Name</td>
<td>The plant name of SAP Digital Manufacturing Cloud for execution.</td>
<td>Example 1000</td>
</tr>
<tr>
<td>Description</td>
<td>The description of the plant of SAP Digital Manufacturing Cloud for execution.</td>
<td>Example 1000 Plant</td>
</tr>
<tr>
<td>ERP Time Zone</td>
<td>The time zone of SAP Digital Manufacturing Cloud for execution.</td>
<td>Example Europe/Berlin</td>
</tr>
</tbody>
</table>
### Local

If set to **Yes**, this plant will be used for integration between SAP Digital Manufacturing Cloud for execution and SAP S/4HANA.

If set to **No**, this plant will be used for integration between Resource Orchestration in SAP Digital Manufacturing Cloud for execution and SAP Manufacturing Execution. Order creation and release are not allowed in SAP Digital Manufacturing Cloud for execution.

---

4. Add or maintain the SAP S/4HANA plant that needs to be integrated with SAP Digital Manufacturing Cloud for execution in the **ERP Integration** section of the **Manage Plants** app.

<table>
<thead>
<tr>
<th>Properties</th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Integration Mode</strong></td>
<td>The integration mode type that is supported.</td>
<td>❖ Example S/4HANA</td>
</tr>
<tr>
<td></td>
<td><em>S/4HANA</em>: Indicates that this plant is integrated with SAP S/4HANA.</td>
<td></td>
</tr>
<tr>
<td></td>
<td><em>S/4HANA Cloud</em>: Indicates that this plant is integrated with SAP S/4HANA Cloud.</td>
<td></td>
</tr>
<tr>
<td><strong>Execution Time Zone</strong></td>
<td>The time zone in SAP Digital Manufacturing Cloud for execution</td>
<td>❖ Example America/New York</td>
</tr>
<tr>
<td><strong>ERP Time Zone</strong></td>
<td>The time zone of SAP S/4HANA</td>
<td>❖ Example Europe/Berlin</td>
</tr>
<tr>
<td><strong>Language</strong></td>
<td>The language used in SAP Digital Manufacturing Cloud for execution</td>
<td>❖ Example English-E</td>
</tr>
</tbody>
</table>
### Properties

<table>
<thead>
<tr>
<th>Properties</th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ERP Destination</strong></td>
<td>If S/4HANA is set for Integration Mode, this field is visible.</td>
<td>Example ECCCLNT500</td>
</tr>
<tr>
<td></td>
<td>Enter the destination name that is configured in SAP Cloud Integration.</td>
<td></td>
</tr>
</tbody>
</table>

### 3.6 Integration with EWM

You can integrate SAP Digital Manufacturing Cloud with EWM to achieve planned and efficient processing of all logistics processes in your warehouse.

#### Why EWM

Different from the Inventory Management (MM-IM) application, EWM provides the option of mapping your entire warehouse complex in detail in the system, down to storage bin level. Not only does this give you an overview of the total quantity of a product in the warehouse, but you can also always see exactly where a specific product is, at any time, in your warehouse complex.

#### Use

You can use advanced production integration to stage products that are needed by production and to post the consumption of products so the goods issue process can be completed. When production is done, you can pack finished goods in a container and trigger the transfer of goods receipt back to SAP ERP.

To learn more about how to set up the configurations to connect SAP Digital Manufacturing Cloud and EWM, see Connecting to EWM in SAP S/4HANA 1909 to 2020 [page 210] or Connecting to EWM in SAP S/4HANA 2021 [page 214]. For the detailed integration processes and transfer of data and goods movements, see Integration Scenarios [page 226].

#### Supported EWM

The integration capabilities mentioned in this documentation only applies to the EWM that is embedded in SAP S/4HANA 1909 FP01 and higher versions.
3.6.1 Connecting to EWM in SAP S/4HANA 1909 to 2020

The page demonstrates the configurations that are required to enable integration with EWM versions from EWM in SAP S/4HANA 1909 to EWM in SAP S/4HANA 2020.

Configuration in SAP S/4HANA

Follow the configuration steps in Connecting to SAP S/4HANA [page 25] to enable communication from EWM to SAP Digital Manufacturing Cloud.

Configuration in EWM

Please refer to SAP Note 2944311 for detailed configurations that needs to be completed in order to enable the integration.
**Configuration in SAP Cloud Connector**

Configure access control to specify the backend systems and resources that can be accessed by your cloud applications.

1. Log on to SAP Cloud Connector.
2. From your subaccount menu, choose *Cloud To On-Premise* and select the tab *Access Control*.
3. Select the virtual host of the EWM system, and add below resources to it.

![Image](image_url)

**i Note**

The virtual host representing the EWM system also needs to be added as property in the RFC destination in SAP Cloud Integration.

**Configuration in SAP Cloud Integration**

Create destinations to specify EWM system for outbound message from SAP Digital Manufacturing Cloud to EWM.

1. Log on to SAP Cloud Platform Cockpit and choose *Connectivity > Destinations*.
2. Choose *New Destination* to create destinations for SAP Cloud Integration with the SAP Cloud Connector.
3. Enter the destination name, and select *RFC* as *Type*.
4. Enter the username and password to access EWM.
5. In *Additional Properties*, add the following properties:

<table>
<thead>
<tr>
<th>Property</th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>jco.client.ashost</td>
<td>The Virtual Host of the EWM system defined in the SAP Cloud Connector.</td>
<td>&lt;virtual host&gt;</td>
</tr>
<tr>
<td>jco.client.client</td>
<td>The client number of EWM.</td>
<td>1000</td>
</tr>
</tbody>
</table>

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Manufacturing Execution Integration

PUBLIC 211
<table>
<thead>
<tr>
<th>Property</th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>jco.client.lang</td>
<td>The language of EWM</td>
<td>EN</td>
</tr>
<tr>
<td>jco.client.sysnr</td>
<td>The system number of EWM</td>
<td>22</td>
</tr>
<tr>
<td>jco.destination.pool_capacity</td>
<td>The connection number.</td>
<td>5</td>
</tr>
</tbody>
</table>

**Configuration in SAP Digital Manufacturing Cloud**

1. Set up logical systems and system destinations. Go to the *Manage Plants* app and configure the following settings.

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Integration Mode</td>
<td>Indicates which ERP system SAP Digital Manufacturing Cloud is integrated with.</td>
<td>S/4 HANA</td>
</tr>
<tr>
<td>ERP Destination</td>
<td>The destination name configured in SAP Cloud Integration which points to the ERP system.</td>
<td>Refer to below screenshot.</td>
</tr>
<tr>
<td>EWM Destination</td>
<td>The destination name configured in SAP Cloud Integration which points to the EWM system.</td>
<td>Refer to below screenshot.</td>
</tr>
<tr>
<td>ERP Logical System</td>
<td>The logical system of ERP defined in EWM system. To see your logical system, in EWM, go to <a href="#">Customizing for Extended Warehouse Management under SCM Basis Integration Basic Settings for Setting Up the System Landscape Name Logical Systems</a></td>
<td></td>
</tr>
</tbody>
</table>
2. Maintain EWM-managed storage locations. Go to the Manage Storage Locations app, create storage locations with the same names as the storage locations in the EWM system, and enable EWM-Managed Storage Location.

3. Go to the Manage Collaboration Links app and assign the following directives to respective collaboration links to enable outbound integration from SAP Digital Manufacturing Cloud to EWM.

<table>
<thead>
<tr>
<th>Collaboration Link</th>
<th>Collaboration Directive</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>EWM_COLLABORATION_SHOPORDER_RELEASE</td>
<td>EWM_SINGLE_ORDER_STAGING_REQUEST</td>
<td>This collaboration link is triggered by order release to send single-order staging request to EWM.</td>
</tr>
<tr>
<td>EWM_COLLABORATION_COMPONENT_A_DD</td>
<td>EWM_COMPONENT_ADD</td>
<td>This collaboration link is triggered by Assembly Point to send component consumption to EWM.</td>
</tr>
<tr>
<td>EWM_COLLABORATION_YIELD_CONFIGURATION</td>
<td>EWM_GOODS_ISSUE_POST</td>
<td>When EWM_COLLABORATION_COMPONENT_A_DD is not configured, this collaboration link is triggered by SFC complete to send component consumption to EWM.</td>
</tr>
<tr>
<td>EWM_COLLABORATION_SFC_DISPOSITION</td>
<td>EWM_SFC_DISPOSITION</td>
<td>When EWM_COLLABORATION_COMPONENT_A_DD is not configured, this collaboration link is triggered by SFC scrap to send component consumption to EWM.</td>
</tr>
<tr>
<td>EWM_COLLABORATION_CONTAINER_CLOSE_CONFIRMATION</td>
<td>EWM_CONTAINER_CLOSE_CONFIRMATION</td>
<td>This collaboration link is triggered by closing container to send goods receipt message to EWM.</td>
</tr>
</tbody>
</table>
### Collaboration Link

<table>
<thead>
<tr>
<th>Collaboration Link</th>
<th>Collaboration Directive</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>COLLABORATION_ERP_SCRAP_CONIRMATION</td>
<td>ERP_SCRAP_CONFIRMATION</td>
<td>This collaboration link is triggered by SFC scrap to report scrapped compo-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>nent quantity to SAP ERP.</td>
</tr>
<tr>
<td>COLLABORATION_ERP_YIELD_CONIRMATION</td>
<td>ERP_YIELD_CONFIRMATION</td>
<td>This collaboration link is triggered by SFC Complete to report quantity of</td>
</tr>
<tr>
<td></td>
<td></td>
<td>finished goods to SAP ERP.</td>
</tr>
</tbody>
</table>

### Related Information

Integration Scenarios [page 226]

### 3.6.2 Connecting to EWM in SAP S/4HANA 2021

This guide is intended for those who want to use the Manage Staging app for material staging functionalities in SAP Digital Manufacturing Cloud. It will guide you through the configuration procedures that are required to enable integration with EWM in SAP S/4HANA 2021.

### Configuration in EWM

Make the following configurations in EWM system. These mainly include using SOA Manager to complete the configuration for consumer proxies for EWM, as well as some stock notification configurations.

1. Check the 4 EWM web services: 1 service provider and 3 service consumers.
   1. Log on to EWM and execute the transaction code SPROXY.
   2. On the Enterprise Services Browser screen, choose Namespaces ➤ http://sap.com/xi/EWM/Global ➤ Object Types ➤ Service Providers ➤ Objects ➤ WarehouseStagingRequest_In, and you can find an object named WarehouseStagingRequest_In.
Repository Browser

Enterprise Services Browser

<table>
<thead>
<tr>
<th>Name</th>
<th>Additional Info</th>
</tr>
</thead>
<tbody>
<tr>
<td>Source</td>
<td></td>
</tr>
<tr>
<td>SWCs</td>
<td></td>
</tr>
<tr>
<td>Packages</td>
<td></td>
</tr>
<tr>
<td>Object Types</td>
<td></td>
</tr>
<tr>
<td>Data Types</td>
<td></td>
</tr>
<tr>
<td>Fault Message Types</td>
<td></td>
</tr>
<tr>
<td>Service Providers</td>
<td></td>
</tr>
<tr>
<td>Source</td>
<td></td>
</tr>
<tr>
<td>SWCs</td>
<td></td>
</tr>
<tr>
<td>Packages</td>
<td></td>
</tr>
<tr>
<td>Objects</td>
<td></td>
</tr>
<tr>
<td>DockAppointmentByElement</td>
<td><a href="http://sap.com/xi/EWM/Global">http://sap.com/xi/EWM/Global</a></td>
</tr>
<tr>
<td>DockAppointmentCancel</td>
<td><a href="http://sap.com/xi/EWM/Global">http://sap.com/xi/EWM/Global</a></td>
</tr>
<tr>
<td>DockAppointmentCancel</td>
<td><a href="http://sap.com/xi/EWM/Global">http://sap.com/xi/EWM/Global</a></td>
</tr>
<tr>
<td>DockAppointmentCreate</td>
<td><a href="http://sap.com/xi/EWM/Global">http://sap.com/xi/EWM/Global</a></td>
</tr>
<tr>
<td>DockAppointmentCreate</td>
<td><a href="http://sap.com/xi/EWM/Global">http://sap.com/xi/EWM/Global</a></td>
</tr>
<tr>
<td>DockAppointmentExn</td>
<td><a href="http://sap.com/xi/EWM/Global">http://sap.com/xi/EWM/Global</a></td>
</tr>
<tr>
<td>DockAppointmentExn</td>
<td><a href="http://sap.com/xi/EWM/Global">http://sap.com/xi/EWM/Global</a></td>
</tr>
<tr>
<td>ForwardingAgreementRequest</td>
<td><a href="http://sap.com/xi/EWM/Global">http://sap.com/xi/EWM/Global</a></td>
</tr>
<tr>
<td>FreightAgreementRequest</td>
<td><a href="http://sap.com/xi/EWM/Global">http://sap.com/xi/EWM/Global</a></td>
</tr>
<tr>
<td>HandlingUnitByIDQueryResponse</td>
<td><a href="http://sap.com/xi/EWM/Global">http://sap.com/xi/EWM/Global</a></td>
</tr>
<tr>
<td>InboundDeliveryByElement</td>
<td><a href="http://sap.com/xi/EWM/Global">http://sap.com/xi/EWM/Global</a></td>
</tr>
<tr>
<td>InventoryByElementsQueryResponse</td>
<td><a href="http://sap.com/xi/EWM/Global">http://sap.com/xi/EWM/Global</a></td>
</tr>
<tr>
<td>OutboundDeliveryByElement</td>
<td><a href="http://sap.com/xi/EWM/Global">http://sap.com/xi/EWM/Global</a></td>
</tr>
<tr>
<td>StorageBinByIDQueryResponse</td>
<td><a href="http://sap.com/xi/EWM/Global">http://sap.com/xi/EWM/Global</a></td>
</tr>
<tr>
<td>SubordinateStorageBin</td>
<td><a href="http://sap.com/xi/EWM/Global">http://sap.com/xi/EWM/Global</a></td>
</tr>
<tr>
<td>SubordinateWarehouse</td>
<td><a href="http://sap.com/xi/EWM/Global">http://sap.com/xi/EWM/Global</a></td>
</tr>
<tr>
<td>SubordinateWarehouse</td>
<td><a href="http://sap.com/xi/EWM/Global">http://sap.com/xi/EWM/Global</a></td>
</tr>
</tbody>
</table>
2. Create and configure logical ports for consumer proxies of the 3 consumer services.
   1. Doubleclick one of the consumer service object checked in above Step 1 to see its detailed information. For example, you can doubleclick WarehouseRequestStatus_Out.
   2. In the top navigation menu, choose Goto > Start SOA Manager.

Repository Browser
Enterprise Services Browser

WarehouseRequestStatus_Out
WarehouseStagingMethod_Out
WarehouseStockChangeNotification_Out

2. Create and configure logical ports for consumer proxies of the 3 consumer services.
   1. Doubleclick one of the consumer service object checked in above Step 1 to see its detailed information. For example, you can doubleclick WarehouseRequestStatus_Out.
   2. In the top navigation menu, choose Goto > Start SOA Manager.
3. On the **Web Service Configuration** screen of SOA Manager, choose **Create Manual Configuration** to define logical ports for the consumer proxy `/SCWM/CO_BIF_STG_WHR_STATUS`.

4. On the manual configuration screen, enter a name in **Logical Port Name**.

5. In **Consumer Security**, enter the user name and password that are used to log on to your SAP Cloud Integration client.

6. In **HTTPSettings**, enter the URL in **URL Access Path**. The URL should be: `<SAP Cloud Integration runtime URL>/cxf/soap/GenericMessageProcessor_00`. For more information about getting SAP Cloud Integration runtime URL, see **How to Get SAP Cloud Integration Runtime URL** [page 32].
7. Continue to complete the remaining steps. You can keep the default settings. Choose Finish.

8. Repeat step a-g to define logical ports for the other two consumer services *WarehouseStagingMethod_Out* and *WarehouseStockChangeNotification_Out*.

3. Create service binding for the provider service *WarehouseStagingRequest_In*.

1. Doubleclick the provider service object *WarehouseStagingRequest_In*.

2. In the top navigation menu, choose Goto Start SOA Manager.

3. On the Web Service Configuration screen of SOA Manager, choose Create Service.

4. In Service and Binding Name, enter Service Name and New Binding Name.

5. In Provider Security step, select User ID/Password in the Authentication Settings section.

6. Continue to complete the remaining steps. You can keep the default settings. Choose Finish.
7. In the Service/Binding list, choose Display Binding for the binding you just created.

8. In the Transport Settings tab, note down the value in Calculated Access URL.

4. Make EWM stock synchronization configurations.
   1. Execute the transaction code SPRO and choose SAP IMG Reference.
   2. Choose SCM Extended Warehouse Management > Extended Warehouse Management > Interfaces > MES Integration > Define Synchronization of Stock Data for MES.
3. Leave the ME System empty, and select Synchronized in Synchronize Stock Data column.
Configuration in SAP Digital Manufacturing Cloud

SAP Digital Manufacturing Cloud

You need to make configurations in SAP Digital Manufacturing Cloud to connect plants and enable integration collaboration with EWM.

1. Log on to SAP Digital Manufacturing Cloud for Execution Fiori Launchpad, and choose the Manage Plants app.
2. For the target plant, choose S/4HANA as Integration Mode, and define ERP Destination, EWM Destination and ERP Logical System.
Configuration in SAP Cloud Integration

Add RFC destination of EWM in SAP Cloud Integration.

1. Log on to SAP Digital Manufacturing Cloud (SAP Cloud Integration tenant) in SAP BTP Cockpit, and choose Connectivity > Destinations in the side menu bar.
2. Choose New Destination, and enter the following fields to create the destination.

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Proxy Type</th>
<th>User</th>
<th>Password</th>
<th>Location ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enter a destina­tion name that is the same as the EWM destination configured in the Manage Plants app in SAP Digital Manufacturing Cloud.</td>
<td>RFC</td>
<td>OnPremise</td>
<td>Enter the user­name to access EWM</td>
<td>Enter the pass­word to access EWM</td>
<td>If you have maintained a location ID in the Cloud Connector, enter the location ID here.</td>
</tr>
</tbody>
</table>

3. Add the following Additional Properties:

<table>
<thead>
<tr>
<th>Property</th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>jco.client.ashost</td>
<td>The Virtual Host of the EWM system as defined in the Cloud Connector.</td>
<td>&lt;virtual host&gt;</td>
</tr>
<tr>
<td></td>
<td><strong>i Note</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>The virtual host defined here should be the same as the EWM destination configured in the Manage Plants app.</td>
<td></td>
</tr>
<tr>
<td>jco.client.client</td>
<td>The client number of EWM.</td>
<td>Example 100</td>
</tr>
<tr>
<td>jco.client.lang</td>
<td>The language of EWM.</td>
<td>Example EN</td>
</tr>
<tr>
<td>jco.client.sysnr</td>
<td>The system number of EWM.</td>
<td>Example 22</td>
</tr>
</tbody>
</table>
### Configuration in Cloud Connector

Add 2 virtual host mappings to support SOAP and RFC outbound requests from cloud connector to EWM.

1. In the cloud connector administration console, choose **Cloud To On-Premise ➜ ACCESS CONTROL**

2. Choose **Add** to map EWM virtual host to cloud connector. In **Protocol**, choose **RFC**.
   
   For RFC protocol, add the same resources as those mentioned in the cloud connector configuration in [Connecting to EWM in SAP S/4HANA 1909 to 2020](page 210).

3. Similarly, add another mapping and this time, specify **HTTPS** as the **Protocol**.
   
   For HTTPS protocol, add **URL Path /** and allow access to **Path And All Sub-Paths**.
Configuration for SAP Cloud Integration iFlow

1. Log on to SAP Cloud Integration and choose the SAP S/4HANA Integration with SAP Digital Manufacturing Cloud package.
2. In the Artifacts tab, search for the EWM OrderStaging process request iFlow.
3. Choose Actions ➤ Configure to set the following parameters.
   - **EWM_PORT**
     Enter the port that is configured in cloud connector virtual host as mentioned in the above Configuration in Cloud Connector section.
   - **EWM_URL**
     Enter the value after the string `warehousestagingrequest` of the Calculated Access URL noted down in the service/binding created for EWM provider service in the above Configuration in EWM section.
   - **Location ID**
     Enter the location ID defined in RFC destination in SAP Cloud Integration.
   - **Credential Name**
     Enter the security material name defined in SAP Cloud Integration.

Related Information

Connecting to EWM in SAP S/4HANA 1909 to 2020 [page 210]
### 3.6.3 Integration Scenarios

The following integration scenarios are supported in EWM integration:

- Material Staging [page 227]
- Staging Confirmation [page 229]
- Component Consumption [page 230]
- Material Consumption [page 231]
- Component Removal [page 232]
- Goods Receipt upon Packing Unit Completion [page 233]
- Goods Receipt Without Packing Unit [page 234]

The following graphic shows the overall process of supply to production and receipt from production.

---

**SAP S/4HANA**
- Create and release a production order
- Execute WM material staging

**EWM**
- The system creates a production material request (PMR) document
- The system creates warehouse tasks for requested materials
- Confirm the warehouse task
- Move requested materials to the production supply area (PSA)

**SAP Digital Manufacturing Cloud**
- The system creates an ERP order
- Stage materials
- The system sends staging request to EWM
- The system creates inventory IDs
- Start
- Complete

---

<table>
<thead>
<tr>
<th>Material Staging [page 227]</th>
</tr>
</thead>
</table>

---

**Start**
**Complete**
3.6.3.1 Material Staging

You can stage materials required for production from EWM using various options.

- You can release an order in the system to trigger single-order staging for this particular order. More information, see Single-Order Staging Request [page 228].
- You can enable auto-staging service and use the production process to trigger single-order staging for a specific SFC of an order. More information, see Staging at SFC Level.
- You can manually request materials in the Manage Staging app. Both single-order staging and cross-order staging are supported. More information, see Manage Staging.

**i Note**

To stage materials using the Manage Staging app, you need to have a minimum version of EWM in SAP S/4HANA 2021.
3.6.3.1.1 Single-Order Staging Request

You can use single-order staging to stage products for a specific order. You can stage required materials from a warehouse managed by EWM to the production supply area (PSA).

Process

Please refer to the graphic Integration Scenarios [page 226] in for the process of single order staging request. You need to manually complete the highlighted steps. The steps in grey are executed automatically by the system.

When you release an order in the system, the single-order staging request is triggered and sent. EWM creates warehouse tasks to move the product to the PSA for each production material request (PMR) item.

<table>
<thead>
<tr>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Each warehouse task has a reference to a single PMR, which means the stock is reserved for the reference PMR.</td>
</tr>
</tbody>
</table>

Prerequisites

EWM

- You have executed WM material staging and the PMR (Production Material Request) is created.
- Make sure that components are on stock in EWM.
- Make sure that your components have correct staging method (Single Order Staging).

SAP Digital Manufacturing Cloud

- A production order has been transferred to SAP Digital Manufacturing Cloud, and the order meets the following requirements:
  - The order has a valid warehouse number.
  - BOM components have been assigned to operation for consumption
  - BOM components have EWM-Managed storage location
  - BOM components have respective UoM assigned.
  - BOM components are not backflushing components.
- You have assigned the EWM_SINGLE_ORDER_STAGING_REQUEST directive to the collaboration link EWM_COLLABORATION_SHOPORDER_RELEASE in the Manage Collaboration Links app.
- You have marked the component storage location as EWM-Managed Storage Location in the Manage Storage Locations app.
- You have configured EWM destination and ERP logical system in the Manage Plants app.
Procedure

1. In SAP Digital Manufacturing Cloud, go to the Manage Orders app and manually release an order.

   **i Note**
   You can also configure the XSLT settings to enable auto-release of orders. For more information, see Releasing Orders.

2. The system triggers a collaboration event and sends the staging request message that contains the list of components to be staged.
   You can see the message in the Monitor Integration Messages app, and it contains the following data:
   - Components you requested
   - Quantity of staged components
   - Reservation item number

   **i Note**
   This is the number that uniquely identifies an item in a reservation. It is required by EWM for the precise determination of the components that have to be withdrawn.
   - Units of measure for staged components

3.6.3.2 Staging Confirmation

In this scenario, you can confirm warehouse tasks and transfer the floor stock data from EWM to SAP Digital Manufacturing Cloud when requested components are staged from the warehouse to the production supply area (PSA).

Process

Please refer to the graphic Integration Scenarios [page 226] in for the process of staging confirmation. You need to manually complete the highlighted steps. The steps in grey are executed automatically by the system.

Prerequisites

**EWM**

Make sure that warehouse tasks are created for staged products.

**SAP Digital Manufacturing Cloud**
Procedure

1. In EWM, confirm the open staging warehouse tasks, and move requested materials to the production supply area (PSA).

2. EWM sends the staging confirmation message to SAP Digital Manufacturing Cloud that contains the following data:
   - Material requested
   - Quantity requested
   - Reservation item number
   - Reservation order number
   - Production supply area
   - PSA bin
   - Handling unit
   - Master handling unit
   - Batch number
   - Serial number

3. In SAP Digital Manufacturing Cloud, go to the Manage Floor Stocks app and verify if the system creates a floor stock record with a reservation to the production order and operation. For inventory ID record (floor stock record) created in SAP Digital Manufacturing Cloud through EWM integration, the EWM Inventory field is true.

   **Note**
   Some additional parameters can be seen in the Manage Floor Stocks app for the stock transferred from EWM:
   - Production Supply Area
   - Storage Bin
   - Handling Unit Number
   - Master Handling Unit Number

3.6.3.3 Component Consumption

You can post component consumption to EWM. When you post consumption, the system posts goods issue for the products. EWM sends a goods movement document to SAP ERP to update the production order there.

Process

Please refer to the graphic Integration Scenarios [page 226] in for the process of posting component consumption. You need to manually complete the highlighted steps. The steps in grey are executed automatically by the system.

Either one of the following actions can trigger the post of the component consumption message:
- Assemble components
- Complete the SFC
- Scrap the SFC

Prerequisites

EWM
You have confirmed staging warehouse tasks and the requested components are moved to the production supply area (PSA).

SAP Digital Manufacturing Cloud
Depending on which action you select to trigger the posting of consumption message, you have assigned respective directive to the collaboration link in the Manage Collaboration Links app.

- If you select to trigger the message when assembling components, assign the EWM_COMPONENT_ADD directive to the collaboration link EWM_COLLABORATION_COMPONENT_ADD.
- If you select to trigger the message when you complete the SFC, assign the EWM_YIELD_CONFIRMATION directive to the collaboration link EWM_COLLABORATION_YIELD_CONFIRMATION.
- If you select to trigger the message when you scrap the SFC, assign the EWM_SFC_DISPOSITION directive to the collaboration link EWM_COLLABORATION_SFC_DISPOSITION.

Procedure

1. In SAP Digital Manufacturing Cloud, go to the Work Center Pod or the Operation Pod app to start the SFC for the released order.
2. Do one of the following depending on the trigger action to which the collaboration directive is assigned:
   - Assemble a discrete component by choosing Assemble.
   - Complete the SFC by choosing Complete.
   - Scrap the SFC by choosing Nonconformance.
3. The system triggers a collaboration event and sends the component consumption message that contains a goods movement of the assembled component to EWM.
   You can see the message in the SAP Cloud Integration.

3.6.3.4 Material Consumption

You can post material consumption to EWM for process orders. When you post consumption, the system posts goods issue for the products. EWM sends a goods movement document to SAP ERP to update the production order there.
Prerequisites

You have confirmed staging warehouse tasks and the requested components are moved to the production supply area (PSA) in EWM.

Procedure

To post material consumption, follow the procedures mentioned in Consuming Materials.

Related Information

Goods Receipt Without Packing Unit [page 234]

3.6.3.5 Component Removal

You can report component removal to EWM. When you report removal, the system posts goods issue reversal for the products. EWM sends a goods movement document to SAP ERP to update the production order there.

Process

Please refer to the graphic Integration Scenarios [page 226] in for the process of posting component removal. You need to manually complete the highlighted steps. The steps in grey are executed automatically by the system.

Prerequisites

EWM

You have confirmed staging warehouse tasks and the requested components are moved to the production supply area (PSA).

SAP Digital Manufacturing Cloud

You have assigned the EWM_COMPONENT_REMOVE_OP directive to the collaboration link COLLABORATION_SFC_COMP_REMOVE_EWM_OP in the Manage Collaboration Links app.
Procedure

1. In SAP Digital Manufacturing Cloud, go to the Work Center Pod or the Operation Pod app to start the SFC for the released order.
2. Remove the component as needed.
3. The system triggers a collaboration event and sends the component removal message that contains a goods movement of the removed component to EWM. You can see the message in the SAP Cloud Integration.

3.6.3.6 Goods Receipt with Packing Unit

You can transfer the goods receipt message to EWM upon packing unit completion. When products move from production to the warehouse, EWM receives them by handling unit (HU) and creates an inbound delivery and post the goods receipt for each HU.

Process

Please refer to the graphic Integration Scenarios [page 226] in for the process of goods receipt transfer. You need to manually complete the highlighted steps. The steps in grey are executed automatically by the system.

Prerequisites

SAP Digital Manufacturing Cloud

- The ERP order transferred to SAP Digital Manufacturing Cloud has an ERP warehouse number that can be mapped to an EWM warehouse number.
- You have completed the SFC for the ERP order.
- You have created a POD with the Packing List plugin.
  1. In SAP Digital Manufacturing Cloud, go to the POD Designer app.
  2. Enter a name and select the type for the POD.
  3. Choose Create.
  4. In the Layout list, choose Plugin Container, then drag and drop it to the space on the right.
  5. In the Plugins list, choose Packing List, then drag and drop it to the plugin container.
  6. On the pod selection space, select the Packing List plugin and choose Publish.
- You have assigned the EWM_CONTAINER_CLOSE_CONFIRMATION directive to the collaboration link EWM_COLLABORATION_CONTAINER_CLOSE in the Manage Collaboration Links app.
Procedure

1. Enter the POD with the Packing List plugin and choose Create Packing Unit.
2. Select the materials you want to pack, and enter the Packing Unit ID.
3. Choose Create.
4. Select the packing unit and select the SFCs you want to pack.
5. Choose Pack.

Related Information

Goods Receipt Without Packing Unit [page 234]

3.6.3.7 Goods Receipt Without Packing Unit

You can transfer the goods receipt message to EWM without using a packing unit. This usually happens when you are dealing with process order production during which you can manually create goods receipts at any operation of the order.

i Note

This feature is only supported for process orders and order-based production orders in the Order POD. The material for which the goods receipt is posted can be finished goods, co-products, and by-products.

Prerequisites

- The ERP order transferred to SAP Digital Manufacturing Cloud has an ERP warehouse number that can be mapped to an EWM warehouse number.
- The material, for which you want to post a goods receipt, has been assigned a default packing material custom field.
  To the custom field, go to the Manage Custom Data app to add a custom field to the Material category. The Data Field must be DEFAULT_PACKING_MATERIAL. Then go to the Manage Materials app to add this custom field to the material.

Procedure

To post goods receipts without packing units, follow the procedures described in Creating Goods Receipts, and pay attention to below points:

- Make sure that the storage location selected is an EWM-managed storage location. You can check this in the Manage Storage Locations app.
• If you specify a handling unit number for the goods receipt posting, make sure the handling unit number conforms to the number range defined for HU identification in the EWM system. To check the number range for HU identification in ERP, execute the transaction code SPRO and then choose SAP Reference IMG. Choose SCM Extended Warehouse Management ➤ Extended Warehouse Management ➤ Cross-Process Settings ➤ Handling Units ➤ External Identification ➤ Define Number Range for HU Identification.

Related Information

Goods Receipt with Packing Unit [page 233]

3.6.3.8 Plant Conversion

If you are managing the same plant in multiple EWM systems, you can use plant conversion to map the EWM plant to different plants in SAP Digital Manufacturing Cloud.

i Note
Plant conversion is supported in integration with EWM in SAP S/4HANA 2021 version or higher.

Procedure

Follow below steps to enable plant conversion in EWM integration:

1. Log on to SAP Cloud Integration and search for the SAP S/4HANA Integration with SAP Digital Manufacturing Cloud package.
2. Enter the package and choose the Artifacts tab.
4. Select the EWM row item and add value mapping configuration.
5. For each EWM plant in one EWM system, add 2 mapping items. For example, if you have maintained the same plant A in 2 EWM systems, you need to configure the mappings as follows:

<table>
<thead>
<tr>
<th>EWM, PLANT</th>
<th>DMC, PLANT</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;EWM programID A&gt;:&lt;EWM Plant A&gt;</td>
<td>&lt;DMC Plant A1&gt;</td>
</tr>
</tbody>
</table>

**i Note**

For EWM embedded in SAP ERP, the EWM Program ID equals ERP logical system maintained in the Manage Plants app.

To see your logical system, in EWM customizing, go to **SCM Extended Warehouse Management** > **SCM Basis** > **Integration** > **Basic Settings for Creating the System Landscape** > **Name Logical Systems**.

<table>
<thead>
<tr>
<th>EWM Destination A&gt;:&lt;EWM PlantA&gt;</th>
<th>&lt;DMC Plant A1&gt;</th>
</tr>
</thead>
</table>

**i Note**

Use the EWM destination maintained in the Manage Plants app. In this app, you can freely define the EWM destination.

<table>
<thead>
<tr>
<th>EWM programID B&gt;:&lt;EWM Plant A&gt;</th>
<th>&lt;DMC Plant B1&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>EWM Destination B&gt;:&lt;EWM PlantA&gt;</td>
<td>&lt;DMC Plant B1&gt;</td>
</tr>
</tbody>
</table>

**Related Information**

Manage Plants
3.6.4 Restrictions and Limitations

This page lists the current restrictions and limitations of EWM integration.

- **Co-Product and By-Product**
  Goods receipt of co-products and by-products to EWM warehouse is only supported in the Order POD for process orders and production orders (order-based).

- **Inventory Disassemble and Return**
  You can’t disassemble a component and return it to the Production Supply Area (PSA).

- **Time-Based Assembly**
  Time-based assembly is not supported.

- **Subassembly**
  Subassembly scenario is currently not supported.

- **Material Version**
  The materials related with EWM integration must have a current version. Otherwise, there might be data inconsistencies between the systems.

- **Inbound / Outbound Message Reinitiation**
  You can use the retry function in Monitor Integration Messages app to reinitiate the processing of inbound / outbound messages. Retry function is supported for most event types of EWM integration, but not for:
  - EWM_GOODS_ISSUE_BY_SFC_COMPLETION
  - EWM_GOODS_ISSUE_BY_SFC_DISPOSITION

- **Automatic Goods Receipt**
  Automatic creation of goods receipt for finished goods triggered by yield quantity reporting is not supported.

- **Backflush Component**
  Consumption of backflush components is not supported in EWM.

- **Non-BOM Component**
  Staging of non-BOM components and consumption of non-BOM components are not available in EWM.

3.7 Troubleshooting Overview

If you run into problems during or after setting up a specific integration scenario, you can find general troubleshooting information in this guide. The information will be updated as applicable.

Troubleshooting for the Integration with SAP S/4HANA [page 238]

Trouble with User Role Management or Role Templates

Due to changes in the usage of business services of the SAP Cloud Platform, certain role collections need to be adjusted, otherwise you won’t be able to access some of the apps on the launchpad. For some Machine Model and Network apps, you need to adjust your role collections by adding some new roles from different applications. For more information, see Role Templates as well as the SAP Note 2924331.

Trouble Using Integrated Floor Stock

If you want to use floor stock integration in SAP Digital Manufacturing Cloud, and be able to transfer floor stock data from and to an SAP ERP, SAP S/4HANA or SAP S/4HANA Cloud system, you need to update certain
settings in your configuration integration. In case of issues, please check that all necessary configuration settings are done.

- If you use SAP ERP or SAP S/4HANA, see Updating Integration Configuration to Use Floor Stock Data [page 107]
- If you use SAP S/4HANA Cloud, see Updating Integration Configuration to Use Floor Stock Data [page 166]

For more detailed troubleshooting information and guidance for a specific integration scenario, please refer to the Implementation Starter Kit for your scenario: Implementation Starter Kits for SAP Digital Manufacturing Cloud.

---

**i Note**

The content of Implementation Starter Kits is available only to registered or licensed customers and partners.

---

### Related Information

- Verification and Troubleshooting for SAP Asset Intelligence Network Integration [page 201]
- Monitor Integration Messages
- How to Contact Us

---

### 3.7.1 Troubleshooting for the Integration with SAP S/4HANA

This section helps you to track, analyse, and resolve issues which can occur regarding the integration between SAP ERP or SAP S/4HANA and SAP Digital Manufacturing Cloud via SAP Cloud Integration using IDOCs.

It provides the following troubleshooting steps per business scenario:

---

**Related Information**

- Master Data Upload from SAP ERP to SAP Digital Manufacturing Cloud Fails [page 238]
- Production Order Transfer to ERP Fails [page 239]
- Production Order Status is not Updated in SAP S/4HANA or SAP ERP [page 240]
- AIN Equipment Registration after Done SFC for Customer Order Fails [page 240]

---

#### 3.7.1.1 Master Data Upload from SAP ERP to SAP Digital Manufacturing Cloud Fails

**Symptom**
Master data has been created in SAP ERP and you are trying to replicate this master data to SAP Digital Manufacturing Cloud, but the data is not available in SAP Digital Manufacturing Cloud.

Troubleshooting Steps

1. Check if the correct IDoc has been created and sent successfully.
2. Check if the IDoc has been created, but not sent.
3. Check, if no IDoc has been created.
   You can find a detailed description of the necessary steps in IDoc Troubleshooting Steps [page 241].
4. If the IDoc has been created and sent, but is not yet visible in SAP Digital Manufacturing Cloud, check the message processing in the SAP Cloud Platform Integration. To do so, follow the steps outlined in SAP Cloud Integration Troubleshooting Steps [page 240] message status in SAP Digital Manufacturing Cloud.
5. You may also check for incoming messages in SAP Digital Manufacturing Cloud. To do so, follow the general guidance on how to use the Monitor Integration Messages app.

Related Information

Monitoring Integration Messages

3.7.1.2 Production Order Transfer to ERP Fails

Symptom

You have released a production order through the transaction codes CO01 or CO02 in SAP S/4HANA or SAP ERP, yet the production order is not reaching SAP Digital Manufacturing Cloud.

Troubleshooting Steps

1. Check if the correct IDoc has been created and sent successfully.
2. Check if the IDoc has been created, but not sent.
3. Check, if no IDoc has been created.
   You can find a detailed description of the necessary steps in IDoc Troubleshooting Steps [page 241].
4. If the IDoc has been created and sent, but is not yet visible in SAP Digital Manufacturing Cloud, check the message processing in the SAP Cloud Platform Integration. To do so, follow the steps outlined in SAP Cloud Integration Troubleshooting Steps [page 240].
5. You may also check for incoming messages in SAP Digital Manufacturing Cloud. To do so, follow the general guidance on how to use the Integration Message Dashboard app.

Related Information

Integration Message Dashboard
3.7.1.3 Production Order Status is not Updated in SAP S/4HANA or SAP ERP

**Symptom**
You are executing a production order on the shop floor. Status updates for Goods Issue, Goods Receive or Order Status are not reaching SAP S/4HANA or SAP ERP.

**Troubleshooting Steps**
1. Check the message status in SAP Digital Manufacturing Cloud. To do so, follow the general guidance on how to use the Monitor Integration Messages app (see related links).
2. If the message has been delivered successfully to SAP Cloud Platform Integration, check the message processing there. To do so, follow the steps outlined in SAP Cloud Integration Troubleshooting Steps [page 240].

**Related Information**
Monitoring Integration Messages

3.7.1.4 AIN Equipment Registration after Done SFC for Customer Order Fails

**Symptom**
You have completed an SFC for a production order that was created out of a sales order for one specific customer. However, no equipment has been created on SAP SAP Asset Intelligence Network.

**Troubleshooting Steps**
Check the message status in SAP Digital Manufacturing Cloud. To do so, follow the general guidance on how to use the Monitor Integration Messages app.

**Related Information**
Monitoring Integration Messages

3.7.1.5 SAP Cloud Integration Troubleshooting Steps

Learn how to troubleshoot for specific IDoc-related issues.
How to open tickets for issues regarding SAP Cloud Integration usage?

If you encounter issues regarding how to use SAP Cloud Integration such as obtaining P-User accounts and restarting SAP Cloud Integration, etc., you can open a customer support ticket and assign it to LOD-HCI-PI component.

How to troubleshoot issues with message processing in SAP Cloud Integration?

For detailed troubleshooting steps, please see SAP Note 3006794.

3.7.1.6 IDoc Troubleshooting Steps

Learn how to troubleshoot for specific IDoc-related issues:

Check if the correct IDoc has been created and sent:

Has the IDoc been created successfully?

1. Access your SAP ERP or SAP S/4HANA system.
2. Use transaction WE02 to find errors in IDoc processing and check for IDocs with status Failed.
3. Choose F8. The system lists all IDocs that were sent in the respective period. IDocs that have successfully been posted outbound have the Status 03 and a green light.

4. If you can’t find the required IDoc in this list, it has not been created successfully in SAP ERP or SAP S/4HANA. If you can see the IDoc in this list, but it doesn’t have Status 03 and a green light, proceed to analyze as outlined below.

Has the created IDoc been sent successfully?

1. Double-click the IDoc you need to analyze. You can find the production order details under Data records.

2. Check the status of the IDoc and the respective error code under Status Records.
### Example

Error Code 02 – Error passing data to port.

<table>
<thead>
<tr>
<th>IDoc display</th>
<th>Additional information</th>
</tr>
</thead>
<tbody>
<tr>
<td>IDoc 00000000118111089</td>
<td></td>
</tr>
<tr>
<td>Data records</td>
<td>Total number: 000029</td>
</tr>
<tr>
<td>Status records</td>
<td>Error passing data to port</td>
</tr>
<tr>
<td>02</td>
<td>No IDoc saved in target</td>
</tr>
<tr>
<td>30</td>
<td>IDoc ready for dispatch (ALE service)</td>
</tr>
<tr>
<td>01</td>
<td>IDoc created</td>
</tr>
</tbody>
</table>

3. Click on the record for detailed information.
According to the diagnosis information, the IDoc has been sent to SAP Cloud Integration with the specified MPL ID. Example:

SAP Cloud Integration: https://v0614-tmn.avt.eu1.hana.ondemand.com:443/itspaces/shell/monitoring/MID: AFu2Yym6kLgUUCKWvyKTTXeW54Xh

4. To solve the issue, go to the SAP Cloud Integration to check the message processing. For more information, see SAP Cloud Integration Troubleshooting Steps [page 240].
3.8 Extensibility Information

This chapter gives an overview of the extensibility options you have for SAP Digital Manufacturing Cloud.

Introduction

With extensibility, you can customize and enhance existing products and functionalities based on industry-specific or customer-specific requirements. This section provides you with an overview of the available extensibility options for SAP Digital Manufacturing Cloud and how to make use of these.


Custom Field Enhancement in XSLT for the integration with SAP S/4HANA Systems

In SAP Digital Manufacturing Cloud, you can add additional fields to various apps to include certain pre-defined or customer-specific attributes and data. Keep in mind that the source field and the target field should have the same name, data type, or length.

You can do customization in XSLT for the integration with SAP S/4HANA system for the following objects:

Material:
- Data to Collect at Assembly
- Data to Collect at Removal
- Data to Collect at Floor Stock Receipt
- Custom Field

Order:
- Operation Resource Type
- Custom Field

BOM:
- Custom Field

Routing:
- Operation Activity Resource Type

If you need data from different systems, the best approach is usually to consolidate this data in a single system before sending it to SAP Digital Manufacturing Cloud. This is even more important if the data needs to be consolidated, including ID mappings, for example.

Using SAP Extension Factory, serverless runtime with SAP Digital Manufacturing Cloud

The SAP Cloud Platform Extension Factory, serverless runtime service lets you build, run, and manage serverless applications that extend your digital core and can react to the latest business changes. The service runs in the Cloud Foundry environment.

To be able to use SAP Cloud Platform Extension Factory, serverless runtime with SAP Digital Manufacturing Cloud, you need to create a service instance of the Services SAP Cloud Platform Extension Factory, serverless runtime. After successful creation, you can work from your subscriptions directly with the Extension Center application.

Production Operator Dashboard (POD) Designer Plug-ins
The POD Designer enables you to design production flows for your production processes. It offers a vast number of plugins that are ready for use by you. Moreover, you can design and add your own plugins to be used within the POD designer.

For more information, see POD Designer.

**SAP Samples**

You can find samples for plugins, business processes, as well as other useful content to show how you can extend your solution to meet your needs in the Develop section on the SAP Help Portal.

**External Services**

You can call an external service registered in the Manage Service Registry app. For more information, see the Business Process Extensions – Developer’s Guide in the Develop section on the SAP Help Portal.
4 Shop Floor Integration

SAP Digital Manufacturing Cloud connects to the shop floor through SAP Plant Connectivity to retrieve machine data for analytics and run production processes.

Integration Overview

4.1 Integration Scenarios

The following integration scenarios are supported:

- **Digital Twin Configuration**
  You use the Machine Model to configure and manage the equipment and service providers to establish connectivity to the shop floor. The model helps you configure the digital twins of the machines on the shop floor. For more information, see: Digital Twin Configuration [page 248].

- **Machine Data Integration**
  You can create service providers that help you connect machine model to tags from external data sources and also services from various external and internal sources. For more information, see: Machine Data Integration [page 250].
• **Production Process Configuration**
  You can use the Production Process Designer to model production processes and translate the production process designs into configurations by deploying them to SAP Plant Connectivity. For more information, see: *Production Process Configuration* [page 252].

• **Production Process Execution**
  SAP Plant Connectivity executes the production processes as configured and transmits data between the machines and SAP Digital Manufacturing Cloud. For more information, see: *Production Process Execution* [page 253].

### 4.1.1 Digital Twin Configuration

Using Machine Model, you can configure and manage the equipment and service providers to establish connectivity to the shop floor. The model helps you configure the digital twins of the machines on the shop floor.

You can configure the equipment with its constant properties, such as dimensions or any other manufacturer specifications as well as the sensor data points.

You can create the digital twin of an equipment using the following apps and wizard:

- **Equipment app**
- **Templates app**
- **Onboarding Equipment into Machine Model wizard**

### Equipment

Using the **Equipment** app, you can create, view, update, and delete equipment. For more information on using the **Equipment** app, see **Managing Equipment**.

An equipment is a physical instance of a model. An operator maintains additional information specific to an item of an equipment such as the following:

- **Installation information:**
  An operator maintains installation information related to an equipment such as serial number of the equipment, tag number of the equipment, installation date of the equipment, and build date of the equipment.

- **Installation location:**
  An operator maintains geographical coordinates of the item of an equipment to locate the location of an item of an equipment.

- **Documents:**
  An operator maintains some best practices information while using the item of an equipment using unstructured documents.

An equipment can be in any of the following states:

- Unpublished
- In Revision
Templates

A template is a format to maintain metadata, that is, attributes and attribute groups, related to a model, equipment, location, system, or spare part. A template inherits metadata from its parent objects, for example, parent subclass templates or other parent templates, and can have additional attribute groups and attributes.

A model template inherits the structure from a parent model template, a parent subclass template, other related parent subclasses, and the parent class.

A template is identified by a unique name and comprises of attribute groups and attributes. An attribute group is a logical grouping of related attributes of the equipment, model and location, and an attribute is a qualifier to define the equipment.

Example - Classification structure and the relationship to model and equipment

1. The class level can be considered the top-node of the classification. A class does not have a parent object, but can have multiple subclasses as child objects.

2. Subclasses are the child objects of a class. It is possible to model multiple subclasses under the top-level subclass. Each child subclass will inherit attributes or attribute groups from its parent objects, that is, class and subclasses.
   In the example:
   - Subclass 1 (Power transformer) would inherit from Class (Transformer)
   - Subclass 2 (Dry-type transformer) would inherit from Subclass 1 (Power transformer) and Class (Transformer)

3. Model Templates – created by manufacturers – are the child objects of a subclass. It is possible to have multiple model templates under the top-level model template. Each child model template will inherit attribute or attribute groups from its parent objects, that is, class and subclasses and model templates. When creating a model, you do this with reference to a model template.
In the example:
- **Model Template 1 (SDT)** would inherit from **Subclass 2 (Dry-type transformer)**, **Subclass 1 (Power transformer)**, and **Class (Transformer)**
- **Model Template 2 (SDT-100x)** would inherit from **Model Template 1 (SDT)**, **Subclass 2 (Dry-type transformer)**, **Subclass 1 (Power transformer)**, and **Class (Transformer)**
- **Model** would be created with reference to **Model Template 2 (SDT-100x)**, and therefore the Model would have all attributes or attribute groups coming from the model template itself as well as the ones inherited.

4. **Equipment Templates** – created by operators – are used to provide equipment-specific attributes or attribute groups. You can use equipment templates as only reference for an equipment or in combination with the templates coming via a model.

**Note**
Similar to the model template it is possible to have multiple equipment templates under the top-level equipment template. Each child equipment template will inherit attribute or attribute groups from its parent object, that is, equipment templates.

In the example:
- **Equipment** was created in reference to **Model**, and therefore this equipment would have all attributes /attribute groups associated with the model, that is, inherit from **Model Template 2 (SDT-100x)**, **Model Template 1 (SDT)**, **Subclass 2 (Dry-type transformer)**, **Subclass 1 (Power transformer)**, and **Class (Transformer)**
- Since **Equipment** was also created in reference to **Equipment Template**, this equipment would additionally have all attributes or attribute groups associated with the equipment template.

For more information on templates, see **Managing Templates**.

---

**Onboarding Equipment into Machine Model Wizard**

You can use the **Onboarding Equipment into Machine Model** wizard to onboard an equipment into the Machine Model. For detailed steps on how to use the wizard, see **Onboarding Equipment into Machine Model**.

**4.1.2 Machine Data Integration**

A machine can contain one or more service providers. A service provider in the machine/equipment model is a server that provides an endpoint with which you gain access to data and functions of the machine. Service providers help you connect machine model to tags from external data sources and also services from various external and internal sources.

With the help of a service provider, you can model objects, services, and tag information in the machine/equipment model. When you configure the service provider, you define the service provider type (internal or external) and the usage of the object in SAP Plant Connectivity (PCo), for example, usage as a data source. The corresponding elements are then deployed to PCo using the activation flow through the **Deploy Shop Floor Elements** app (see **Deploy Shop Floor Elements**). The following table shows which objects (that you configure in the machine/equipment model) correspond to which configuration elements in PCo.
## Mapping of Entities

<table>
<thead>
<tr>
<th>Object in Machine Mode</th>
<th>Service Provider Type</th>
<th>Usage Type</th>
<th>PCo Configuration Elements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service provider</td>
<td>External</td>
<td>OPC UA data Source</td>
<td>OPC UA source system and corresponding agent instance</td>
</tr>
<tr>
<td>Service provider</td>
<td>External</td>
<td>OPC DA data Source</td>
<td>OPC DA source system and corresponding agent instance</td>
</tr>
<tr>
<td>Service provider</td>
<td>External</td>
<td>IP21 data source</td>
<td>IP21 source system and corresponding agent instance</td>
</tr>
<tr>
<td>Service provider</td>
<td>External</td>
<td>AF data source</td>
<td>Asset Framework source system and corresponding agent instance</td>
</tr>
<tr>
<td>Service provider</td>
<td>External</td>
<td>OPC UA server (in this case, you select methods and not tags)</td>
<td>OPC UA source system (without agent instance)</td>
</tr>
<tr>
<td>Service provider</td>
<td>External</td>
<td>Web server</td>
<td>Service provider is only created in the PCo database; display in the PCo Management Console is not possible</td>
</tr>
<tr>
<td>Service provider</td>
<td>Internal</td>
<td>OPC UA server</td>
<td>OPC UA server created and running in PCo and corresponding Agent instance</td>
</tr>
<tr>
<td>Service provider</td>
<td>Internal</td>
<td>Web server</td>
<td>Web server created and running in PCo and corresponding Agent instance</td>
</tr>
<tr>
<td>Tag</td>
<td>Internal</td>
<td>-</td>
<td>Tag</td>
</tr>
<tr>
<td>Service</td>
<td>External</td>
<td>-</td>
<td>Service, only metadata, display in the PCo Management Console is not possible</td>
</tr>
<tr>
<td>Service</td>
<td>Internal</td>
<td>Direct destination call</td>
<td>Service, method definition, method notification with reference to a destination system</td>
</tr>
<tr>
<td>Client proxy</td>
<td>-</td>
<td>Universal Web Server</td>
<td>Destination system of the type Universal Web service destination system (RESTful)</td>
</tr>
<tr>
<td>Client proxy</td>
<td>-</td>
<td>OPC UA Server</td>
<td>Destination system of type OPC UA destination system</td>
</tr>
</tbody>
</table>

### Managing Service Providers

You can use the service provider to model the following:
- **Data source**
  You can connect an external data source, such as an OPC UA server, and define all the properties of the data source here. The data source provides tags.

- **External server (type: OPC UA server)**
  You can connect an external OPC UA server that provides methods.

- **Internal server (type: OPC UA server)**
  You can define an OPC UA server that is created automatically in the PCo. You can define the methods here in the configuration of the service provider.

- **Internal server (type: Web server)**
  You can define a PCo Web server that is created automatically in PCo. You can define the Web services here in the configuration of the service.

- **Execution in SAP Manufacturing Cloud**
  You can connect a Digital Manufacturing Execution service offered in the SAP Digital Manufacturing Cloud to the machine model. The manufacturing services allow you, for example, to start or complete an SFC.

For more information on configuring service providers, see [Managing Service Providers](#).

Also, see [Example: How to Create an OPC UA Source System Using the Machine/Equipment Model](#) for an example on how to create an OPC UA source system using the machine/equipment model.

### 4.1.3 Production Process Configuration

Using the Production Process Designer, you can model production processes (automation sequences) that automate the production on the shop floor using services provided by service providers connected to PCo systems. After a design is completed, you deploy and activate the production process design to transfer the configurations to the runtime environment, including these PCo systems.

#### 4.1.3.1 Mapping Between Process Models and PCo Configurations

The production processes (automation sequences) created in a production process design correspond to certain configuration elements in an SAP Plant Connectivity (PCo) system.

<table>
<thead>
<tr>
<th>Production Process</th>
<th>SAP Plant Connectivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Production Process</td>
<td>Multiple call destination system</td>
</tr>
<tr>
<td>Input parameters</td>
<td>Input variables</td>
</tr>
<tr>
<td>Output parameters</td>
<td>Output variables</td>
</tr>
<tr>
<td>Variables</td>
<td>Temporary variables</td>
</tr>
<tr>
<td>Service</td>
<td>Destination system</td>
</tr>
</tbody>
</table>
### 4.1.4 Production Process Execution

As a manufacturing automation software, SAP Plant Connectivity enables machine-to-machine communication and connects equipment with SAP Digital Manufacturing Cloud. After a shop floor design is deployed to SAP Plant Connectivity, it is responsible to do the following:

- Execute automation that’s configured by shop floor designs
- Call services in SAP Digital Manufacturing Cloud when tag values change
- Write values that are passed from SAP Digital Manufacturing Cloud into tags on equipment
- Read tag values from equipment and pass them on to SAP Digital Manufacturing Cloud

### 4.2 Integrate with SAP Plant Connectivity

SAP Plant Connectivity is the connectivity layer between SAP Digital Manufacturing Cloud and the shop floor. As SAP Plant Connectivity is installed on the customer’s premises, a cloud connector is required for the communication from SAP Digital Manufacturing Cloud to SAP Plant Connectivity. In addition, the communication needs to be secured by valid certificates.

The supported versions of SAP Plant Connectivity are available in [3038525](#).

### Enable Communication from Cloud to SAP Plant Connectivity

#### Prerequisites

- Configure required certificates:
  1. Obtain the following certificate:
     - An X.509 certificate issued for the hostname of the computer on which SAP Plant Connectivity is installed.

<table>
<thead>
<tr>
<th>Production Process</th>
<th>SAP Plant Connectivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parameters</td>
<td>Parameters of a destination system</td>
</tr>
<tr>
<td>Subscriptions</td>
<td>Subscriptions</td>
</tr>
</tbody>
</table>

**Note**

The hostname must be a fully qualified domain name (FQDN). In addition, specify the hostname in **PCo Management Console > Tools > Cloud Integration > Internal WebSocket Communication > Host Settings**.
This certificate enables HTTPS communication between SAP Plant Connectivity and the cloud connector. The certificate can be either signed by a CA or self-signed (recommended only for test and demo purposes).

2. Import the certificate into the Microsoft certificate store for Local Computer.

3. Install the certificates:
   - For a signed certificate, the CA certificate chain - all certificates in the certificate path, including the root certificate and, if any, all intermediate certificates - must be placed in the Issuer store location in the filesystem: C:\ProgramData\SAP\PCo\CertificateStores \CloudServicesHost\Issuer\certs.
   - For a self-signed certificate, the public key of the certificate must be placed in the Trusted store location in the filesystem: C:\ProgramData\SAP\PCo\CertificateStores \CloudServicesHost\Trusted\certs.

- The user who is doing the initial configuration should be manually added to SAP Plant Connectivity and should be assigned the SAP Plant Connectivity roles Administrator, CertificateAdministrator, and PCoConfigurator. The user IDs of SAP Digital Manufacturing Cloud users who perform operations to interact with SAP Plant Connectivity need to be configured as users in SAP Plant Connectivity.

   **Note**
   The user ID depends on the subject name identifier configured in the identity provider for SAP Digital Manufacturing Cloud. For more information, see Configure Identity Federation.

From SAP Plant Connectivity 15.4 SP2, the Administrator user can assign the SAP Plant Connectivity roles to additional users through user groups.

**Procedure**

1. To set up the cloud connector, including configuring access to SAP Plant Connectivity and certificate authentication, see Setting Up the Cloud Connector [page 13].

2. Ensure that the cloud services that are hosted by the SAP Plant Connectivity main service are active and that a suitable port has been assigned to them. To check this setting, go to PCo Management Console > Tools > Options > Global Settings > Main Service. In the Cloud Services section, the Active checkbox and a suitable port must be selected.

3. In PCo Management Console > Tools > Cloud Integration, configure cloud integration settings and add users for the communication between SAP Plant Connectivity and the Cloud as shown here:

<table>
<thead>
<tr>
<th>Setting</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Server Security Settings</td>
<td>Authentication Mode: Select Principal Propagation and Certificate.</td>
</tr>
<tr>
<td></td>
<td>Server Certificate: Select the certificate issued for the hostname of the local computer</td>
</tr>
</tbody>
</table>

Now, the cloud services in SAP Plant Connectivity runs in HTTPS mode with principal propagation enabled.
4. In PCo Management Console > Tools > Cloud Integration, add SAP Digital Manufacturing Cloud users. These users are typically automation engineers or production engineers that use Machine Model and the Production Process Designer. For example, if you want to deploy a service or shop floor design to SAP Plant Connectivity, the users responsible for those areas must be maintained here.

   a. On the User Configuration tab, add required users and configure roles.

   Configure SAP Plant Connectivity roles based on the SAP Digital Manufacturing Cloud roles of each user.

   **Note**

   The Administrator role is reserved for user and authorization management and is not business related. For more information, see PCo Security Guide.

   The role mappings have been updated since PCo version 15.3 SP1.

<table>
<thead>
<tr>
<th>SAP Digital Manufacturing Cloud Role</th>
<th>SAP Plant Connectivity Role</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administrator</td>
<td>CertificateAdministrator</td>
</tr>
<tr>
<td>Cloud Administrator</td>
<td>PCoConfigurator</td>
</tr>
<tr>
<td>Role \ SAP Plant Connectivity</td>
<td>ServiceExecutor</td>
</tr>
<tr>
<td>Role</td>
<td>DataReader</td>
</tr>
<tr>
<td>Role</td>
<td>DataStorer</td>
</tr>
<tr>
<td>Role</td>
<td>FileProcessor</td>
</tr>
<tr>
<td>Role</td>
<td>Operator</td>
</tr>
<tr>
<td>Product Engineer</td>
<td>Yes</td>
</tr>
<tr>
<td>Automation Engineer</td>
<td>Yes</td>
</tr>
<tr>
<td>[Deprecated] Product Process Specialist</td>
<td>Yes</td>
</tr>
<tr>
<td>Product Supervisor</td>
<td>Yes</td>
</tr>
<tr>
<td>Product Operator</td>
<td>Yes</td>
</tr>
<tr>
<td>Manufacturing Admin</td>
<td>Yes</td>
</tr>
</tbody>
</table>

   The role mappings have been updated since PCo version 15.3 SP1.
5. In \( \text{Shop Floor Engineering} \) \( \rightarrow \text{Machine Model and Connectivity} \), create a new cloud connector or edit an existing one to map the virtual host to the SAP Plant Connectivity.

6. In \( \text{Shop Floor Engineering} \) \( \rightarrow \text{Machine Model and Connectivity} \), create a new SAP Plant Connectivity system with the Cloud Integration Server URL.

The user who creates the SAP Plant Connectivity system in the cloud must be authorized as the \textit{Administrator} and \textit{Certificate Administrator}. To get authorization, choose \textit{User Authorization} under \textit{Cloud Integration}. If you do not have access to the menu, then you must follow steps described in the following section to configure SAP Plant Connectivity for the cloud.

For more information, see \textit{Machine Model and Connectivity}.

---

### Enable Communication from SAP Plant Connectivity to Cloud

#### Context

**Example Scenario**

A production engineer wants to subscribe to an indicator to invoke the \texttt{startSFC} service of SAP Digital Manufacturing Cloud to start a new SFC according to predefined conditions when the value of the indicator is changed.
Procedure

1. In Shop Floor Engineering ➤ Machine Model and Connectivity ➤ go to the Detail page of the SAP Plant Connectivity system and download the SAML XML file.

2. In the cockpit for the SAP BTP subaccount where you have subscribed to SAP Digital Manufacturing Cloud, do the following:
      1. Go to your subaccount.
      2. Go to a space.
      3. Choose Services ➤ Service Marketplace and then select the Digital Manufacturing Cloud Services tile.
      4. Choose Instances.
      5. Choose New Instance.
      6. Create a new instance:
         1. Select a service plan.
         2. Enter a name for the instance.
         3. Choose Finish.
   b. Configure trust to the SAP Plant Connectivity system by, in this case, importing the SAML metadata.
      SAP Plant Connectivity works as an identity provider in this case. For more information, see Establish Trust and Federation with UAA Using Any SAML Identity Provider.
      You do not need to register the subaccount in SAP Plant Connectivity as an application provider; SAP Plant Connectivity authenticates the subaccount using the certificate.
   c. Create a new role collection and assign the role Automation_Technical_User from the service instance, with an application identifier starting with dmc-services-<randomString>, to the role collection.
      For more information, see Configure Authorization by Creating Role Collections.
   d. Assign the role collection to a technical user: pco_integration_user.
      For more information, see Directly Assign Role Collections to Users.

4.2.1 Assignment of PCo Role From Version 15.4 SP2

PCo roles can be manually assigned to users in PCo or assigned to user groups in SAP Digital Manufacturing Cloud. Assigning PCo roles to user groups helps minimize the downtime in PCo as the assignment is managed from the Cloud.

Access to PCo functions for SAP Digital Manufacturing Cloud users is managed by assigning the relevant PCo roles to user groups.

Prerequisites

Before the assignment, ensure the following:
1. User groups with users are created in your Identity Authentication tenant.

2. Role collections in SAP Digital Manufacturing Cloud are assigned to the relevant user groups in SAP Cloud Platform.

3. You have to set the Principal Type to None in the mapping of the Virtual to Internal System of the cloud connector to allow authorization checks that consider user groups.

For more information, see Manage Users and Authorization.

PCo roles correspond to certain user rights that are required in SAP Digital Manufacturing Cloud. User groups with users are created in your Identity Authentication to perform PCo functions. You assign the user rights to user groups in the Plant Connectivity section of the Machine Model and Connectivity app. For information on how to assign user rights to user groups, see Assigning PCo Roles.

When a new plant connectivity is configured in SAP Digital Manufacturing Cloud, by default a technical user group SAP_Technical_UG is available that can be used to manage service calls from production processes running in cloud. The access to read indicator values is provided by default. Access for other services such as applying set points, writing indicator values, printing through file transfer to network location managed in PCo, triggering of PCo processes configured through cloud and so on can be provided by editing the permissions of the technical group.

For an existing Plant Connectivity, the option to create the default technical user group is available in the Plant Connectivity section of the Machine Model and Connectivity app.

See the table below to know the user right that corresponds to a specific role in PCo:

<table>
<thead>
<tr>
<th>User Right in SAP Digital Manufacturing Cloud</th>
<th>PCo Role</th>
<th>Role Description in PCo</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manage machine model configuration</td>
<td>PCoConfigurator</td>
<td>Configuration of Plant Connectivity</td>
</tr>
<tr>
<td>Read access to Indicator measurements</td>
<td>DataReader</td>
<td>Reading and Browsing of Data Tags</td>
</tr>
<tr>
<td>Operate shop floor systems (start/stop agents)</td>
<td>Operator</td>
<td>Starting and Stopping of Service Providers</td>
</tr>
<tr>
<td>Write access to set Indicator value</td>
<td>FileProcessor</td>
<td>Reading and Writing of Files</td>
</tr>
<tr>
<td>Invoke production process or PCo services</td>
<td>ServiceExecutor</td>
<td>Execution of Services</td>
</tr>
<tr>
<td>Administration of certificates</td>
<td>CertificateAdministrator</td>
<td>Administration of Certificates</td>
</tr>
<tr>
<td>Printing/File storage</td>
<td>DataStorer</td>
<td>Writing of Data Tags</td>
</tr>
</tbody>
</table>

4.3 Enabling Time Series Data Ingestion for Equipment

SAP Digital Manufacturing Cloud gives you access to the SAP Internet of Things (SAP IoT) service with subscriptions in the Manage Automatic Triggers app. The integration enables you to send indicator values (time series data) that are consumed by IoT service(s) using the MQTT protocol. The indicator values can be pushed to IoT device connectivity from SAP Plant Connectivity (PCo) through the PCo subscription feature by configuring DMC Data Ingestion action type.
Prerequisites for Data Ingestion

This topic details the prerequisite steps required to use the data ingestion function.

1. Assign a service plan for SAP IoT to a subaccount.

   **i Note**
   
   You can create service instances under this service plan in the spaces in this subaccount. As a prerequisite make sure the SAP IoT entitlement has been allocated to your SAP Business Technology Platform global account.

   1. Log on to the SAP Business Technology Platform cockpit and select a region.
   2. Select a global account.
   3. Choose Entitlements.
   4. Select the Subaccounts mode, select one or more subaccounts, and then choose Go. Note that the Services mode is only for displaying available services.
   5. Assign an appropriate service plan to each subaccount.
      1. Choose Configure Entitlements Add Service Plans.
      2. In the service catalog, search for SAP IoT.
      3. Select the appropriate service plan, corresponding to your license.
   6. Save the configurations.

2. Create SAP IoT service instance.

   1. In the SAP BTP Cockpit, navigate to your Global Account.
   2. In the navigation pane, choose Subaccounts and choose your subaccount.
   3. In the navigation pane, choose Spaces and click the space which you would like to create the new SAP IoT service instance. For details on creating a space, see Enabling Cloud Foundry of the Getting Started with SAP IoT guide.
   4. In the navigation pane, choose Services Service Marketplace.
   5. In the list of available instances, look up SAP IoT.
   6. Choose Create.
      The system presents the New Instance or Subscription dialog box.
   7. Choose SAP IoT as service.
   8. Depending on your subscription type, make sure that the service plan has been set to default.
   9. Choose Cloud Foundry as runtime environment. Choose a space and give an instance name.
   10. Choose Next twice to walk through the wizard sequence without making changes.
   11. Choose Create.
   12. Choose the newly created instance.
   13. In the Service Keys section, choose Create.
   14. Enter a Service Key Name for the service key, for example default.
   15. Choose Create.
      The system presents a JSON data record.
   16. In the JSON data, search for the fields clientid, clientsecret, and url in the "uaa" section. Search for the field mqtt in the "iot-device-connectivity" section. Also, note the value of the field iot-device-connectivity from the "endpoints" section. These data are needed for the next configuration steps. You can of course navigate to this page anytime later to retrieve the values.
3. Open a support ticket at this link on component MFG-DM-OPS with your tenant name and ID. You can find your ID in the subaccount section where you found your subdomain name. You also need to provide clientId and mqtt from the JSON data record in the ticket.

4. Create SAP IoT destination.
   1. Go to subaccount and create new destination with name SAPIoTRemoteConnection.
   2. Choose OAuth2ClientCredentials authentication and find the value of Client ID, Client Secret, and URL from the JSON data record in step 1. Token Service URL will be url suffixed with /oauth/token.

5. Configure the SAP IoT as external system.

   i Note

You should have the role of CONFIGURATION_EDIT from ac_broker to perform this action.

1. Log on to SAP Digital Manufacturing Cloud.
2. Launch the Application Settings app.
3. Choose the External Systems tab.
4. Choose Add SAP Cloud Platform Internet of Things 4.0
5. In the Add System dialog box, provide these details:

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>System Name</td>
<td>Provide a unique system name.</td>
</tr>
</tbody>
</table>
### Field Description

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>System Status</td>
<td>Active</td>
</tr>
<tr>
<td>URL Information</td>
<td>The value of &quot;iot-device-connectivity&quot; from the service key. For example, &quot;<a href="https://iot-device-connectivity-noah-live.cfapps.eu10.hana.ondemand.com">https://iot-device-connectivity-noah-live.cfapps.eu10.hana.ondemand.com</a>&quot;</td>
</tr>
<tr>
<td>User Name</td>
<td>oauth</td>
</tr>
<tr>
<td>Password</td>
<td>Any dummy password would work.</td>
</tr>
<tr>
<td>Additional Information</td>
<td>If required.</td>
</tr>
<tr>
<td>Primary System</td>
<td>Use toggle.</td>
</tr>
</tbody>
</table>

6. Choose **OK**. The external system with details is populated in the **External Systems** list in the **Application Settings** window.

6. **Onboard equipment.**

Once a piece of equipment is created and published in SAP Digital Manufacturing Cloud, it is synchronized and objects are created in SAP Internet of Things. The following graphic displays the synchronization flow:
The following graphic displays the mapping between SAP Digital Manufacturing Cloud equipment model and IoT device connectivity model:

- For every equipment a device is created. The device will be associated with capabilities corresponding to indicator groups, the indicators coming from both model templates and equipment templates in the Equipment app.
- When you have created a piece of equipment based on model with additional templates, for every model template and equipment template in the Equipment app, a sensor type is created in IoT Device Connectivity. Also, only one sensor will be created for each device corresponding to a piece of equipment. See Device Model of the About SAP IoT Device Connectivity guide to learn more about device connectivity.

7. Configure equipment in the Equipment app.
   - For new equipment, enable IoT Sync and choose MQTT as gateway in the configuration. After you publish the equipment, the connection status on the equipment header will show as "online". The external ID for SAP IoT will also be displayed in the Equipment app.
   - You can only onboard equipments with model to IoT.
   - For existing equipment, create a new version. Make sure that the equipment is enabled for IoT Sync in the configuration and is published.

   **i Note**
   You can only enable data ingestion to IoT for equipment assigned with model. Equipment created from equipment templates is not supported.

8. Enable data ingestion in the PCo instance in the Machine Model and Connectivity app.

   **i Note**
   For details, see Add Plant Connectivity. The PCo version that is supported is 15.4.2 or above.
Application Scenarios

You can use the time series data collected in SAP IoT service in the Line Monitor (LM) POD plugin to display an overview of overall asset status for various work centers in a specific time range. For details on how to visualize the ingested data in a POD, see Line Monitor Indicator Chart.

Next Step

For details on how to use data ingestion in subscriptions, see Manage Subscriptions and Create a Subscription.

4.4 Integration with SAP MII

This document guides the user to set up the integration between SAP Manufacturing Integration and Intelligence (MII). The integration enables the user to import transactions from MII and design production processes with these transactions as services.

Prerequisites

You have added the SAP Digital Manufacturing Cloud subaccount in your cloud connector.

Set up cloud connector

1. Log on to the cloud connector administration console.
2. Choose <YourSubaccount> ➤ Cloud To On-Premise.
3. Map your MII system to a virtual system configured in the cloud connector:
   1. On the ACCESS CONTROL tab, in the Mapping Virtual To Internal System section, choose + (Add).
2. Specify the backend type as *SAP Application Server Java*.
3. Specify the protocol as either *HTTP* or *HTTPS*, as appropriate.
4. Specify the internal host and internal port.
5. Specify the virtual host and virtual port.
6. Select the principal type as *None*.
7. Select *Use Internal Host for Host in Request Header*.
8. Optionally, enter a description for this system.

4. Configure access control to the resources on your MII system:
   1. Select the newly created system.
   2. In the *Resources Of <System>* section, choose ‡* (Add)*.
   3. Add the resource.

![Add Resource](image)

**Create destination for MII system**

1. Log on to your subaccount for SAP Digital Manufacturing Cloud.
2. Choose †Connectivity ‡Destinations †
3. Choose *New Destination*.
4. Enter the following information:

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>Enter an identifiable and unique name.</td>
</tr>
</tbody>
</table>
### Field | Description
--- | ---
Description | [Optional] Enter a description for the destination.
Type | Select **HTTP**.
URL | Enter `http://<virtualhost>:<virtualport>` or `https://<virtualhost>:<virtualport>`, according to your configuration in the cloud connector.
Proxy Type | Select **OnPremise**.
Authentication | Select **BasicAuthentication**.
User | Enter the user name and password for an MII user that has the SAP_XMII_Administrator or SAP_XMII_Developer role. To create custom role with specific actions, see Actions for Permissions.

#### i Note

XMII_Read_Only is a must action for the customized role. You should be assigned to the transactions that you want to import into the service registry.

#### Caution

There is security risk to use HTTP/Basic authentication in destination configuration.

5. Save the destination.
6. Check if the connection is OK.

#### i Note

Ignore 404 (Not Found) error, if any. However, you will still need to check other errors such as 401 (Unauthorized).

---

**Create a web server for MII and manage destinations**

For details, see Manage Web Servers.

**Import transactions into service registry**

For details, see Import MII Transactions.
4.5 Troubleshooting for Machine Model and Connectivity

This section provides description of typical problems that you may encounter while configuring cloud connector and plant connectivity, and establishing connectivity between SAP Digital Manufacturing Cloud and Plant Connectivity.

4.5.1 Connectivity Issues

The following are the issues that you may face while establishing connectivity between SAP Digital Manufacturing Cloud and Plant Connectivity through Cloud Connector.

**Connection cannot be established; please contact your system administrator**

Follow these steps to verify the configurations on Cloud Connector/PCo to debug the connectivity issue between SAP Digital Manufacturing Cloud and SAP Plant Connectivity.

1. Go to Cloud Connector and open your Subaccount. Verify if the status shows **Connected** and **Location ID** value is the same as configured in DMC Cloud Connector object in the Machine Model and Connectivity application (Note: If multiple cloud connectors are connected, different Location IDs are must be configured.)

2. Choose **Cloud to On-Premise** to verify the mapping in Mapping Virtual to Internal System. Verify the Virtual Host and Virtual Port values shown here are same as configured in the DMC Cloud connector object.

3. Go to **Principal Propagation** tab and check if the IDP configurations have been synchronized. In case there is an update of the SAML IDP configuration for a subaccount on cloud side, then you must trigger synchronize action again by refreshing the trust configuration (using the Refresh option).

4. Choose Configuration and go to the **On Premise** tab. Verify that the **System** and **CA Certificates** are added and are valid.
   1. For a signed certificate, verify if the CA certificate chain (all certificates in the certificate path, including the root certificate and, if any, all intermediate certificates) have been placed in the Issuer store location in the filesystem: *C:\ProgramData\SAP\PCo\CertificateStores\CloudServicesHost\Issuer\certs*. Ensure that the certificate is valid.
   2. For a self-signed certificate, verify if the public key of the certificate has been placed in the Trusted store location in the filesystem: *C:\ProgramData\SAP\PCo\CertificateStores\CloudServicesHost\Trusted\certs*.

5. Check if Principal Propagation is set to name (this is the default setting).

6. Go to **Tools** menu in Management console in PCo and choose Cloud Integration. Verify if the server status is **Connected**. Go to the **Server Security Settings** tab and check if the **Principal Propagation** checkbox is selected.

7. In the **Certificate** field, check if the certificate that you have created for the PCo cloud server is selected and is valid (has not expired).
4.5.2 Internal Server Error

An internal server error occurred in SAP PCo. Please contact the system administrator.

Please check SAP PCo CloudServicesHost log. The log files (PCoCloudServerLog_yyyy.MM.dd.csv) can be found under C:\Program Files (x86)\SAP\Plant Connectivity\Logs. See the error logs for the time duration.

4.5.3 User Authentication Issues

SAP PCo is not able to authenticate the user.

This error occurs due to missing user entry in SAP PCo Cloud Integration. You need to add all users who require access to PCo cloud services through DMC in PCo under Tools Cloud Integration User Configuration. The user ID in PCo should match the Subject Name Identifier attribute selected in Identity Authentication Service of the user. For example, if the attribute value is E-Mail which means the email id of DMC user should be provided in user ID field of PCo.

4.5.4 Error Codes

This section lists the error codes.

<table>
<thead>
<tr>
<th>HTTP Error Codes</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>401</td>
<td>User is not authorized in cloud connector; refresh principal propagation setting in cloud connector.</td>
</tr>
<tr>
<td>403</td>
<td>SAP PCo is not able to authenticate the user. Check the connectivity from Cloud Connector to SAP PCo and verify if SAP PCo Cloud integration Server is running in the Principal Propagation mode. Verify if the user ID is maintained in PCo User configuration.</td>
</tr>
<tr>
<td>HTTP Error Codes</td>
<td>Action</td>
</tr>
<tr>
<td>------------------</td>
<td>--------</td>
</tr>
<tr>
<td>414 or 503</td>
<td>Check whether the virtual URL and Location ID are correct. Check the connectivity from Cloud Connector to SAP PCo and verify if SAP PCo Cloud integration Server is running in the Principal Propagation mode by following the steps listed in Connectivity Issues [page 266].</td>
</tr>
<tr>
<td>500</td>
<td>There is a PCo internal server error. Ask customer to check SAP PCo CloudServicesHost log. The log files (<code>PCoCloudServerLog_yyyy.MM.dd.csv</code>) can be found under <code>C:\Program Files (x86)\SAP\Plant Connectivity\Logs</code>. Look for error logs for the time duration.</td>
</tr>
<tr>
<td>502</td>
<td>Cloud connector is not reachable. Check cloud connector and SAP PCo configuration by following the steps listed Connectivity Issues [page 266].</td>
</tr>
</tbody>
</table>
SAP Digital Manufacturing Cloud for insights is an analytics application for manufacturing industries. It analyzes standard manufacturing KPIs using individually defined dashboards. You can also define personalized KPIs.

You can connect to different on-premise business systems, which are used as data sources. The relevant data is replicated from the source system to the HANA Database. The KPIs are calculated based on the data from the connected systems.

**iNote**
- SAP S/4HANA Cloud is **not** supported
- The following versions of SAP S/4HANA on premise **are supported**:
  - SAP S/4HANA (on premise)
  - SAP S/4HANA in HEC

_SAP Digital Manufacturing Cloud for Insights_ can connect to the shop floor through SAP Plant Connectivity (PCo) to show real-time sensor data. The application can also connect live to SAP Analytics Cloud to consume manufacturing KPIs in a Digital Boardroom.

**Architecture Overview**

**Integration Scenarios**

To support the integration as shown in the graphic, the following system integrations are needed:
• Application Data Integration:
  ○ Integration with SAP ERP (as of SAP ECC 6.0 or higher)
  ○ Integration with SAP S/4HANA on-premise (1709 or higher)
  ○ Integration with SAP Manufacturing Execution (as of SAP ME 15.1 or higher)
  ○ Integration with SAP ERP combined with SAP ME (see Integration with SAP ERP, SAP ME, and SAP MII OEE [page 270])
  ○ Integration with SAP MII (15.2 or higher) and SAP ERP

• Third-Party Integration:
  ○ Integration with a third-party MES system using Analytical Model (only for custom KPIs).
    For more information, see Integration with Third-Party Data Using Analytical Model

• Machine Data Integration:
  ○ Integration with Machine Model and PCo (as of 15.2 or higher) for visualizing machine/sensor data. For more information, see About Machine Model and Connectivity.

• SAP Analytics Cloud Integration:
  ○ For more information, see Integration with SAP Analytics Cloud

### Note
SAP Digital Manufacturing Cloud for insights offers a set of standard KPIs. There is a dependency between the KPIs and the system used as data source. If you want to analyze ME-related KPIs, you must be connected with the SAP Manufacturing Execution (ME) system. For more information, see Overview: System Dependency of KPI Calculation [page 271].

### 5.1 Integration with SAP ERP, SAP ME, and SAP MII OEE

ME systems provide overall control and management of the shop floor and updates information back to the SAP ERP system. MES bridges the gap between the planning system (SAP ERP/MRP) and the control system to manage shop floor execution. IT integrated manufacturing becomes incomplete without MES integration. MES captures data pertaining to production as well as quality at a much more granular level than SAP ERP while a shop order is being executed. This data is efficiently channelized and helps in gaining deeper insights in areas of quality management, performance analysis, process management, traceability, and genealogy.

MII-OEE provides a lean-order execution, based on ERP production/process orders, along with the OEE KPI calculation.

Manufacturing Insights provides insights in the form of KPIs in the above-mentioned areas, by extracting the captured data from the SAP ME system and the SAP MII-OEE system, and then integrating it with SAP ERP data.

You can extract and replicate data from SAP ERP, SAP ME, and SAP MII-OEE using either SAP SDI or DMC Data Engineering.

The planning data from SAP ERP and, if available, the execution data from SAP ME or SAP MII-OEE is replicated and aggregated wherever necessary, using the KPI specific logic.
5.1.1 Overview: System Dependency of KPI Calculation

<table>
<thead>
<tr>
<th>ERP or S/4</th>
<th>MII-OEE</th>
<th>ME/DMCE</th>
<th>KPI Calculations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>Not Applicable</td>
<td>No</td>
<td>All KPIs calculated are based on data from SAP ERP. First Pass Yield, Actual Cycle Time and OEE are not supported with ERP data alone.</td>
</tr>
<tr>
<td>Yes</td>
<td>Not Applicable</td>
<td>Yes</td>
<td>All order level KPIs are calculated based on SAP ME data except Completion Performance to PO Completed Date, which is calculated using SAP ERP data. Work center level KPIs are calculated for those SAP ME work centers that are mapped to SAP ERP work centers.</td>
</tr>
<tr>
<td>No</td>
<td>Not Applicable</td>
<td>Yes</td>
<td>Order level KPIs except Completion Performance to PO Completed Date are calculated and First Pass Yield at work center level.</td>
</tr>
<tr>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>OEE KPIs are calculated based on data from MII-OEE, and other KPIs are calculated based on ERP data.</td>
</tr>
</tbody>
</table>

*Note*
It is mandatory to configure the SAP ERP system, if you want to integrate MII-OEE.

5.1.2 Setting up the Connection to SAP Digital Manufacturing Cloud for Insights

You can setup the connection to SAP Digital Manufacturing Cloud for Insights in two ways: Using SDI or using DMC Data Engineering.
SDI works for DMC hosted on AWS and MS Azure. However, for DMC hosted on MS Azure, we recommend you use DMC Data Engineering.

Using SDI: SAP HANA Smart Data Integration (SDI) is used to replicate the business data from on-premise systems to the HANA database in SAP Digital Manufacturing Cloud. SDI is offering a HANA DP Agent 2.0 for this purpose. It’s a client component that is available with your cloud license and has to be installed on the on-premise network to set up the connection.

1. Install and configure SDI (HANA DP Agent 2.0). For more information, see Install the Data Provisioning Agent.
2. Depending on the source database, configure the appropriate adapter. Based on the adapter you choose, provide permissions to data source tables, as seen under Data Replication [page 273].

3. Once the DP Agent is configured, Create a Customer Incident [page 273]. The SAP DevOps team will reach out to you with the progress in replication.
4. Any data table changes at the source system are tracked automatically by the DP agent. Once the DP agent gets the table changes, it sends these changes to the SAP HANA database.

5. Maintain the plant details, such as logical system ID and plant code, in the Manage Plants application for the on-premise systems, that you intend to use as the data source. For more information, refer Manage Plants.

To setup the connection using DMC Data Engineering: Refer the Setup Guide.

Result: After these steps in the workflow are completed, the data tables are available in Digital Manufacturing Cloud and are continuously updated. You can now configure the standard KPIs or define your own KPIs.

Related Information:
- Data Provisioning Adapters
- Downloading and Configuring the HANA DP Agent 2.0
- Configure the Data Provisioning Agent
- SAP HANA Smart Data Integration Data Provisioning Agent Sizing Guide
- Configuring the Agent in Graphical Mode
5.1.2.1 Create a Customer Incident

Once you configure the DP Agent, the process of data replication can be initiated. To start this process, create an incident.

You must create an incident on the Support Portal.

**i Note**

S-User account is required.

The required support component details are as follows:

- **Onboarding and Operations Issue**: MFG-DM-OPS
- **Short Text**: DMC Data Replication: Request for technical information <CUSTOMER_NAME>
- **Priority**: Medium
- **Detailed Text**:  
  - DB type (HANA, Oracle, MSSQL and so on)
  - Host
  - Port Number
  - Database Name
  - Schema
  - Period for Data Replication (For example - 3 months, 6 months and so on)
  - System ID for each system (or Netweaver ID if SID does not exist)
  - Client (Client needed if it is ERP)

Please share a username and password in secure storage. This user must have SELECT, TRIGGER and CREATE ANY permissions, with the GRANT option, on the source system SCHEMA.

**i Note**

After installation and configuration of the agent, update dpagentconfig.ini in the root folder as follows, and then restart the agent:

- parameter framework.async.fetchSize: set to 50
- parameter framework.maxDataSize: set to 5MB
- parameter framework.fetchSize: set to 1000

5.1.2.2 Data Replication

SAP replicates a fixed set of data tables from the source systems based on certain start data.

- ERP (SAP S/4HANA and ECC 6.0) Tables [page 274]
- ERP (SAP S/4HANA) Tables for PQM [page 277]
- SAP MII Tables [page 278]
- SAP ME Tables [page 279]

After replication, the data tables are available in the SAP HANA database, that is used by SAP Digital Manufacturing Cloud.
Any data table changes at the source system is being tracked automatically by the DP agent. Once the DP agent gets the changes, it sends the delta to the SAP HANA database.

**Note**
The DP agent has different mechanisms based on the source database. For example: HANA database uses triggers. Microsoft SQL uses logs.

For DMC Data Engineering, any data table changes at the source system is being tracked automatically by the Data Engineering agent. Once the Data Engineering agent gets the changes, it sends the delta to the SAP DMC database, based on the schedule maintained. For more information, refer the Manage Data Models topic in DMC Data Engineering.

### 5.1.2.2.1 ERP (SAP S/4HANA and ECC 6.0) Tables

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<td>Task list - header</td>
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### 5.1.2.2.2 ERP (SAP S/4HANA) Tables for PQM

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<td>Batches</td>
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<td>MKAL</td>
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<td>BOM header</td>
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<td>Table used to store BOM item data</td>
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### 5.1.2.2.3 SAP MII Tables

#### SAP MII

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### 5.1.2.2.4 SAP ME Tables

**SAP ME**

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SAP Digital Manufacturing Cloud Integration Guide
SAP Digital Manufacturing Cloud for insights Integration
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### 5.1.3 API Integration with Data Engineering

You can use an OData API to get data that is replicated via Data Engineering from on-premises systems. This document provides information on the API path, authentication methods, and query options for the OData API.

**i Note**

For more information about the service root URI, resource path, and query option, see [URI Conventions (OData Version 2.0)](https://help.sap.com/). For additional information on OData services with Data Engineering, see [3076590](https://help.sap.com/).
Prerequisites

You have replicated data from a supported on-premises system to SAP Digital Manufacturing Cloud database using data models. For details, see Setup Guide for Data Engineering.

API Path

The table lists the API paths for different system types:

<table>
<thead>
<tr>
<th>System Type</th>
<th>Method</th>
<th>API Path</th>
<th>Example</th>
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<tbody>
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<td><code>https://{environment}. {region}.dmc.cloud.sap/extractor/v1/me</code></td>
<td><code>https://api.eu20.dmc.cloud.sap/extractor/v1/me</code></td>
</tr>
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<td>SAP ME ODS</td>
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</tr>
<tr>
<td>SAP S/4HANA</td>
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</tr>
</tbody>
</table>

iNote

`{environment}`: “api” for productive landscape or “api.test” for quality landscape

Authentication

Two authentication methods are supported to authorize an API client to call the OData API:

1. OAuth 2.0 client credentials (For how to get client ID/secret and token URL, see Prepare for API Integration.)
2. User token (Manufacturing_Admin role)
## Query Option

<table>
<thead>
<tr>
<th>Query Option</th>
<th>Definition</th>
<th>Example</th>
</tr>
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<tbody>
<tr>
<td>$metadata</td>
<td>Returns table metadata, such as properties, primary keys and data types.</td>
<td><code>https://api.eu20.dmc.cloud.sap/extractor/v1/erp/$metadata</code></td>
</tr>
<tr>
<td>$orderby</td>
<td>Orders result set by specified value(s). Default order is ascending (asc); or descending (desc).</td>
<td><code>https://api.eu20.dmc.cloud.sap/extractor/v1/erp/AFRU?$orderby=WERKS desc</code></td>
</tr>
<tr>
<td>Query Option</td>
<td>Definition</td>
<td>Example</td>
</tr>
<tr>
<td>--------------</td>
<td>------------</td>
<td>---------</td>
</tr>
<tr>
<td><code>$filter</code></td>
<td>Returns a subset of result by selecting only those entities that satisfy the predicate expression specified by the query option.</td>
<td><a href="https://api.eu20.dmc.cloud.sap/extractor/v1/erp/AFRU?$filter=WERKS">https://api.eu20.dmc.cloud.sap/extractor/v1/erp/AFRU?$filter=WERKS</a> eq 'US01'</td>
</tr>
<tr>
<td></td>
<td></td>
<td><a href="https://api.eu20.dmc.cloud.sap/extractor/v1/erp/AFRU?$filter=ISERH">https://api.eu20.dmc.cloud.sap/extractor/v1/erp/AFRU?$filter=ISERH</a> gt 1.0m</td>
</tr>
<tr>
<td></td>
<td></td>
<td><a href="https://api.eu20.dmc.cloud.sap/extractor/v1/erp/AFRU?$filter=WERKS">https://api.eu20.dmc.cloud.sap/extractor/v1/erp/AFRU?$filter=WERKS</a> eq '0001' or AUFNR eq '000002560085'</td>
</tr>
<tr>
<td></td>
<td></td>
<td><a href="https://api.eu20.dmc.cloud.sap/extractor/v1/erp/AFRU?$filter=startswith(AUFNR,'000002555656">https://api.eu20.dmc.cloud.sap/extractor/v1/erp/AFRU?$filter=startswith(AUFNR,'000002555656</a>')</td>
</tr>
<tr>
<td><code>$select</code></td>
<td>Returns only the properties as selected.</td>
<td><a href="https://api.eu20.dmc.cloud.sap/extractor/v1/erp/AFRU?$select=WERKS,AUFNR">https://api.eu20.dmc.cloud.sap/extractor/v1/erp/AFRU?$select=WERKS,AUFNR</a></td>
</tr>
</tbody>
</table>

**i Note**

Operators supported:
- `eq`: equal to
- `ne`: not equal to
- `gt`: greater than
- `ge`: greater than or equal to
- `lt`: less than
- `le`: less than or equal to
- `and`: logical and
- `or`: logical or

For details on primitive data types used along with the operators, see [Overview (OData Version 2.0)](https://api.eu20.dmc.cloud.sap/extractor/v1/erp/AFRU).

Functions supported:
- `substringof('<string>', <column>)`: searches for values in the given column that contains the given string
- `startswith(<column>, '<string>')`: searches for values in the given column that starts with the given string
- `endswith(<column>, '<string>')`: searches for values in the given column that ends with the given string
<table>
<thead>
<tr>
<th>Query Option</th>
<th>Definition</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>$top</td>
<td>Returns only the first $N$ records, where $N$ is a positive integer.</td>
<td><a href="https://api.eu20.dmc.cloud.sap/extractor/v1/erp/AFRU?$top=10000">https://api.eu20.dmc.cloud.sap/extractor/v1/erp/AFRU?$top=10000</a></td>
</tr>
<tr>
<td></td>
<td><strong>Caution</strong></td>
<td>A limit is set on the records that can be returned. For more information, see 3076590.</td>
</tr>
<tr>
<td>$skip</td>
<td>Skips the first $N$ records, where $N$ is a positive integer.</td>
<td><a href="https://api.eu20.dmc.cloud.sap/extractor/v1/erp/AFRU?$skip=100">https://api.eu20.dmc.cloud.sap/extractor/v1/erp/AFRU?$skip=100</a></td>
</tr>
<tr>
<td>$inlinecount</td>
<td>Must be combined with a $filter condition and returns the count of filtered values. Accepted values: allpages and none (equals to no $inlinecount specified).</td>
<td><a href="https://api.eu20.dmc.cloud.sap/extractor/v1/erp/AFRU?$filter=WERKS">https://api.eu20.dmc.cloud.sap/extractor/v1/erp/AFRU?$filter=WERKS</a> eq 'US01'&amp;$inlinecount=allpages</td>
</tr>
<tr>
<td>(with keys)</td>
<td>Returns the record(s) with given key values.</td>
<td><a href="https://api.eu20.dmc.cloud.sap/extractor/v1/erp/AFRU?MANDT='910',RMZHL='00000001',RUECK='0001766954',SID='QKJCLNT910">https://api.eu20.dmc.cloud.sap/extractor/v1/erp/AFRU?MANDT='910',RMZHL='00000001',RUECK='0001766954',SID='QKJCLNT910</a>'</td>
</tr>
</tbody>
</table>

**Note**

When you fetch data from a column with a slash in its name, for example, "/MRSS/PL_STRU_ID", the column name will be replaced with "MRSS_PL_STRU_ID" in the URI. Therefore in these situations you will need to check the name change with the query option of $metadata first and then use the valid name in the URI, for example, https://dm-internal-azure-az-sysint-fnd-api-gateway-ms.cfapps.eu20.hana.ondemand.com/extractor/v1/erp/AUFK?$top=100&$filter=MRSS_PL_STRU_ID eq 'NULL'.

### 5.2 Integration with SAP Integrated Business Planning

You can navigate to the Plant Insights application in Digital Manufacturing Cloud for Insights, from the SAP Integrated Business Planning (IBP) solution, for a specific plant and material.

You can therefore, get in-depth insights on plant performance.
You can trigger navigation to the Plant Insights application from multiple IBP applications, such as Alerts, Analytics, Intelligent Visibility, and so on.

You can easily navigate from IBP analytics to Insights, while identifying certain critical sales orders that are facing delays in execution in certain plants, thereby providing an end-to-end user experience.

### Configuring Connectivity Between Insights and IBP

1. Refer Manage Navigation to Other Systems to navigate to the Digital Manufacturing Cloud for Insights system.
2. Open any IBP application where the navigation has been enabled.
3. Use the navigation functionality as provided with the applications, to open the Plant Insights application.

### More Information

Here are some IBP applications, from where you can navigate to the Digital Manufacturing Cloud Plant Insights application:

- Alerts
- Analytics
- Intelligent Visibility

### 5.3 Configuring Integration with SAP Analytics Cloud

KPIs from Manufacturing Insights can be visualized in SAP Analytics Cloud using Live Data Connection of type SAP HANA.

### Configuring Connectivity between SAP Analytics Cloud and Manufacturing Insights

1. Log on to the SAP Analytics Cloud system.
2. From the Main Menu choose Connection.
3. Choose "Add Connection" ➔ Live Data Connection ➔ SAP HANA ➔
4. Enter the name and description for the HANA Live connection.
5. Enter the following connection details:
Connection Details

<table>
<thead>
<tr>
<th>Connection Type</th>
<th>Direct</th>
</tr>
</thead>
<tbody>
<tr>
<td>Host</td>
<td>Enter the URL of the SAP Digital Manufacturing Cloud launchpad. For example, if the URL is <code>https://&lt;subdomain&gt;.insights.dmc.eu10.cloud.sap</code>, then enter <code>&lt;subdomain&gt;.insights.dmc.eu10.cloud.sap</code> in the Host field.</td>
</tr>
<tr>
<td>HTTPS Port</td>
<td>443</td>
</tr>
<tr>
<td>Authentication Method</td>
<td>SAML Single Sign On</td>
</tr>
</tbody>
</table>

6. Enter your Digital Manufacturing in Cloud credentials in the popup screen that opens.
7. Save your entries.
   Calculation views of KPIs from the Insights bundle are available for consumption in SAP Analytics Cloud.

More Information

- Live Data Connections to SAP HANA
- See the SAP Analytics Cloud help portal page: [SAP Analytics Cloud → SAP Analytics Cloud Help](#)

5.3.1 Manufacturing Insights Calculation Views

List of calculation views from Manufacturing Insights that can be accessed from SAP Analytics Cloud.

<table>
<thead>
<tr>
<th>KPI</th>
<th>Calculation View</th>
</tr>
</thead>
<tbody>
<tr>
<td>Start on Time</td>
<td><code>sap.dmi.kpi.persistence::CvStartOnTime</code></td>
</tr>
<tr>
<td>Finish on Time</td>
<td><code>sap.dmi.kpi.persistence::CvFinishOnTime</code></td>
</tr>
<tr>
<td>Actual Cycle Time</td>
<td><code>sap.dmi.kpi.persistence::ActualCycleTimeView</code></td>
</tr>
<tr>
<td>Build Conformance</td>
<td><code>sap.dmi.kpi.persistence::BuildConformanceView</code></td>
</tr>
<tr>
<td>Schedule Conformance</td>
<td><code>sap.dmi.kpi.persistence::ScheduleConformanceView</code></td>
</tr>
<tr>
<td>Completion Item Accuracy</td>
<td><code>sap.dmi.kpi.persistence::PoCompletedInFullView</code></td>
</tr>
<tr>
<td>Completion Performance to Production Order Complete Date</td>
<td><code>sap.dmi.kpi.persistence::CompletionPerformanceetoProductionView</code></td>
</tr>
</tbody>
</table>
### KPI Calculation View

<table>
<thead>
<tr>
<th>KPI</th>
<th>Calculation View</th>
</tr>
</thead>
<tbody>
<tr>
<td>Defect Count</td>
<td>sap.dmi.kpi.persistence::DefectCountView</td>
</tr>
<tr>
<td>Defect Per Unit</td>
<td>sap.dmi.kpi.persistence::DefectPerUnitView</td>
</tr>
<tr>
<td>Past Due Orders</td>
<td>sap.dmi.kpi.persistence::PastDueOrdersView</td>
</tr>
<tr>
<td>First Pass Yield</td>
<td>sap.dmi.kpi.persistence::FirstPassYieldView</td>
</tr>
<tr>
<td>Production Orders Completed in Full</td>
<td>sap.dmi.kpi.persistence::PoCompletedInFullView</td>
</tr>
<tr>
<td>Production Order Quantity Variance</td>
<td>sap.dmi.kpi.persistence::ProductionOrderQuantVarianceView</td>
</tr>
<tr>
<td>Completion Quantity Accuracy</td>
<td>sap.dmi.kpi.persistence::PoCompletedInFullView</td>
</tr>
<tr>
<td>Overall Equipment Efficiency (OEE)</td>
<td>sap.dmi.kpi.KpiWithTarget::OEEWithTargetView</td>
</tr>
<tr>
<td>Availability</td>
<td>sap.dmi.kpi.KpiWithTarget::AvailabilityWithTargetsView</td>
</tr>
<tr>
<td>Performance</td>
<td>sap.dmi.kpi.KpiWithTarget::PerformanceWithTargetsView</td>
</tr>
<tr>
<td>Quality</td>
<td>sap.dmi.kpi.KpiWithTarget::QualityWithTargetsView</td>
</tr>
</tbody>
</table>

**Note**

The name of the calculation view generated when a KPI level is created in an analytical model contains the names of the analytical model and the KPI level. This helps in identifying the calculation view in SAP Analytics Cloud.

### 5.4 Embedding SAP Analytics Cloud (SAC) Stories in Digital Manufacturing Cloud for Insights

You must create a connection between SAC and Digital Manufacturing Cloud for Insights. To create this connection, perform the following steps.

**Steps:**

1. Login to SAP Analytics Cloud.
2. Go to System > Administration > App Integration.
3. Choose Add a New OAuth Client.
4. Enter the following information:

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>Enter SAC_OAUTH_DESTINATION_CLONING.</td>
</tr>
<tr>
<td>Purpose</td>
<td>State a purpose, for example: Interactive Usage.</td>
</tr>
</tbody>
</table>
| Redirect URI | Specify the redirect URI. It should follow the pattern:  
DMC_Application_URI/SacView |

**i Note**
While adding an OAuth Client, choose the Interactive Usage mode, as mentioned under Purpose. For more information, refer the topic: Managing OAuth Clients.

5. Login to the Digital Manufacturing Cloud for Insights tenant and navigate to the Cloud Foundry Administration page. For more information, see Create a Destination in an SAP Cloud Platform Subaccount.

**i Note**
Under the App Integration tab, in the Trusted Origins section, click Add a Trusted Origin to enter the DMI URL.

6. Choose New Destination and enter the following information:

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>Enter SAC_OAUTH_DESTINATION.</td>
</tr>
<tr>
<td>Type</td>
<td>Select HTTP.</td>
</tr>
<tr>
<td>Description</td>
<td>Provide a brief description.</td>
</tr>
<tr>
<td>URL</td>
<td>Enter the authorization URL for SAC. The path is: System &gt; Administration &gt; App Integration.</td>
</tr>
<tr>
<td>Proxy Type</td>
<td>Select Internet.</td>
</tr>
<tr>
<td>Authentication</td>
<td>Choose No Authentication.</td>
</tr>
</tbody>
</table>

**SAP Digital Manufacturing Cloud Integration Guide**
SAP Digital Manufacturing Cloud for insights Integration
### Field Description

**Token URL**

- **Description**: Enter the Token URL from SAC. The path is: Administration > App Integration > OAuth Clients.

  - **Note**: The **Token URL** field does not pre-exist. It has to be maintained as an additional property (`tokenUrl`).

**Additional Properties**

- **Description**: Provide information as follows: client ID (`client_id`), SAC Domain (`sacDomain`), and client secret (`client_secret`).

  - **Note**: In **Additional Properties**, enter the same information as Redirect URI (the same URI you use, while adding the OAuth Client). Similarly, for Client ID, Client Secret, and SAC Domain (SACs base URI), use the same values entered while creating the OAuth Client. The Client Secret is auto-maintained. For Authorization Grant, select Authorization Code from the dropdown.

7. Choose **Check Connection** to verify if the connection is successful, and then choose **Export**.

### 5.5 Configuring Integration with Third-Party MES Using Analytical Model

You can integrate third-party data, that is, third-party MES data with Manufacturing Insights using the Analytical Model. However, this is only possible if you want to use customer-defined KPIs. The source system must push the data to DMC-Insights, using insert APIs. An insert query is used to continuously feed the analytical model. Therefore, you need to get authentication details for the insert query, using a service key. To get this service key, you must configure the service broker.

#### Service Broker Configuration

Perform the following steps:

1. In the **SAP Cloud Cockpit**, choose **Enable Cloud Foundry**.
2. When prompted for a Cloud Foundry organization name, enter a name.
3. After the organization is created, on the menu to the left, choose **Spaces**.
4. Choose **New Space** and enter a name. Assign yourself as space manager and space developer.
5. Go to SAP Cloud Platform Cockpit (of Execution in SAP Digital Manufacturing Cloud) > Services > Service Marketplace.


7. Select Instances from the left menu.

8. Choose New Instance to create new service instance.

**Note**

The new service instance is created by the following the CF CLI command: `cf create-service <service> <plan> <service-instance> -c parameters.json`. See Create Service.


10. Select the service instance created in previous steps.

11. Choose Service Keys from the left menu.

12. Choose Create Service Key to create new service key for the service instance.

**Note**

The new service key can be created by the following CF CLI command: `cf create-service-key SERVICE_INSTANCE SERVICE_KEY [-c PARAMETERS_AS_JSON]`. See Create Service Key.

13. Verify the uaa information against the service key.

**Note**

The new content of the service key can be viewed by using the following CF CLI command: `cf service-key SERVICE_INSTANCE SERVICE_KEY`. See Create Service Key.

14. Go to SAP Cloud Platform Cockpit (of Execution in SAP Digital Manufacturing Cloud) > Services > Service Instances > Service Key. You can see the clientid and clientsecret parameters under the uaa tag.

15. To insert data into the Analytical Model, you must use the OAuth 2.0 client. You need to use the Authentication URL, clientid and clientsecret from the service key and the insert query application URL. The URLs are as follows:

   Authentication URL:
   `<URL from uaa tag of service key>/oauth/token?grant_type=client_credentials`

   **Note**

   For the following URLs, replace the placeholders (<> mentioned in the URLs with the details in this table. This is for the two landscapes: PROD and Quality.

<table>
<thead>
<tr>
<th>Landscapes</th>
<th>PROD Landscape</th>
<th>Quality Landscape</th>
</tr>
</thead>
<tbody>
<tr>
<td>eu10</td>
<td>prod</td>
<td>quality</td>
</tr>
<tr>
<td>eu20</td>
<td>az-prod</td>
<td>az-quality</td>
</tr>
</tbody>
</table>
Insert Query get Metadata URL:
```
dm-prod<prod>-fnd-analytical-model-insert-query.cfapps.<eu10>.hana.ondemand.com/aminsertquery/v1.0/metadata/<DataSource Name>
```

**i Note**
Attributes are not sorted in any particular order in the data source. The attribute order is always different.

Insert Query Post URL:
```
dm-prod<prod>-fnd-analytical-model-insert-query.cfapps.<eu10>.hana.ondemand.com/aminsertquery/v1.0/analyticalmodel/<AM Name>/<Level Name>/<Datasource Name>
```

**i Note**
- eu10 is configurable, based on your sub-account region.
- If you use eu20, use this insert query post URL `dm-prod-az-prod-fnd-analytical-model-insert-query.cfapps.eu20.hana.ondemand.com/aminsertquery/v1.0/analyticalmodel/<AM Name>/<Level Name>/<Datasource Name>`

16. To insert data into the Custom Attribute of the Master Object in the Analytical Model, you must use the OAuth 2.0 client. You need to use the Authentication URL, clientid and clientsecret from the service key and the insert query application URL. The URLs are as follows:

**Authentication URL:**
```
<URL from uaa tag of service key>/oauth/token?grant_type=client_credentials
```

**Master Object Custom Attribute Insert Query get Metadata URL:**
```
dm-prod<prod>-fnd-analytical-model-insert-query.cfapps.<eu10>.hana.ondemand.com/aminsertquery/v1.0/masterobject/<AM Name>/<Level Name>
```

**i Note**
Attributes are not sorted in any particular order in the data source. The attribute order is always different.

**Master Object Custom Attribute Insert Query Post URL:**
```
dm-prod<prod>-fnd-analytical-model-insert-query.cfapps.<eu10>.hana.ondemand.com/aminsertquery/v1.0/masterobject/customattribute/<AM Name>/<Level Name>
```

**i Note**
- eu10 is configurable, based on your sub-account region.
- If you use eu20, use this insert query post URL `dm-prod-az-prod-fnd-analytical-model-insert-query.cfapps.eu20.hana.ondemand.com/aminsertquery/v1.0/masterobject/customattribute/<AM Name>/<Level Name>`
- The ID in the Post URL must be taken from the response of the Get call.

**More Information**

See: [Analytical Model](#)
See: Manage Analytical Models
6 Network Integration

Network provides a collaborative platform that connects customers and suppliers. With its many integration scenarios, you can expand your existing IT landscape to make your sourcing process more effective and efficient with collaboration data.

Integration Overview

For more information about each scenario, see Integration Scenarios [page 295].

6.1 Integration Scenarios

Network supports various integration scenarios. The supported systems include both on-premises and cloud systems.

i Note

Both customers and suppliers can develop third-party extensions for integration with Network. However, out-of-the-box integration scenarios are supported only for customers, excluding private customers.

The integration scenarios are supported by various systems, as follows:
Scenario Details

Click each scenario for more details.

The graphics illustrate the data flow in each integration scenario. In some scenarios, the communication (process flow) is contrary to the data flow and is shown in a dashed line. For example, to retrieve the RFQ status from an ERP system, SAP S/4HANA needs to call the ERP system rather than the other way around.

Scenarios

1. Request for quotation
2. Sourcing through SAP Ariba
3. Part integration
4. Quality Info Record Integration for PPAP
5. Parts analysis for additive manufacturing
Request for Quotation

By creating a request for quotation in Network, you can initiate a procurement process. The request for quotation is based on a collaboration between you and your supplier on topics like design and initial pricing. Upon its creation, the request for quotation is automatically sent to an integrated ERP system.

Integrated Systems

Either of the following ERP systems:

- SAP S/4HANA Cloud
- SAP S/4HANA

Scenario

1. Create a request for quotation in Network based on the collaboration data.
2. Send the request for quotation to an ERP system.
3. A corresponding request for quotation is created in the ERP system with the relevant collaboration data added as an attachment.
4. When the status of the request for quotation is updated in the ERP system, the status change is also shown in Network.

More Information

Create Requests for Quotation

Sourcing Through SAP Ariba

If your ERP system is integrated with SAP Ariba Sourcing, you can send requests for quotation to more than one supplier. In this case, the request for quotation is the start of collaboration with interested suppliers, instead of being the end of an existing collaboration. Upon receiving the request for quotation, interested suppliers can accept the invitation for collaboration from Ariba Network and enter a collaboration room that’s created automatically.
Integrated Systems
- SAP S/4HANA Cloud or SAP S/4HANA
- SAP Ariba Sourcing

Scenario
1. Create a request for quotation in Network that meets special requirements.
2. Send the request for quotation to an ERP system.
3. Publish the request for quotation from the ERP system to SAP Ariba Sourcing.
4. Create a sourcing project and invite suppliers (Ariba vendors) from Ariba Network.
5. Suppliers enter collaboration rooms in Network to collaborate.

More Information
Work with SAP Ariba Sourcing

Part/Product Integration
You can collaborate with suppliers on a design file that is transferred from an integrated ERP system for a particular material (part). In addition, when you create inspection records for the engineering samples, the information of the relevant purchase order is available as a reference.
Integrated Systems

- SAP S/4HANA

Scenario

The integration points include the following:

- Based on a product (part) maintained in SAP S/4HANA, create a collaboration room in Network.
- Based on the design file (.vds) transferred from SAP S/4HANA for this product (part), collaborate with your supplier on the design details.
- Link each inspection with a purchase order in SAP S/4HANA for the engineering samples.

More Information

- Create a Collaboration Room

Quality Info Record Integration for PPAP

You can collaborate with your supplier in a collaboration room on the PPAP (Production Part Approval Process) for a part.

The PPAP status and the first article inspection status are reflected back in the quality info record created in SAP S/4HANA Cloud. The collaboration room stores the PPAP documents and first article inspection records for later review.
Integrated Systems

- SAP S/4HANA Cloud

Scenario

1. Enable the PPAP function for a quality info record
2. Work with the supplier in a corresponding collaboration room on PPAP documents and inspection.
3. Complete the collaboration to close the PPAP process

More Information

Work on Production Part Approval Process for Quality Management

Parts Analysis for Additive Manufacturing

You can import part information from an integrated ERP system and evaluate if the parts are suitable for additive manufacturing. In addition, by integrating with an extension, you can automate the evaluation process conducted by a third-party agency.
Integrated Systems
- SAP S/4HANA Cloud
- SAP S/4HANA

Scenario
1. Create a worklist.
2. Import parts from an integrated ERP system.
   You can also import parts manually or using CSV files.
3. Enter analysis results into the worklist.

More Information
Analyze Parts for Additive Manufacturing

6.2 Integrate with SAP S/4HANA Cloud

Integrate Network with an SAP S/4HANA Cloud system.

Supported Integration Scenarios
- Request for Quotation
- Sourcing through SAP Ariba
- Quality Info Record Integration for PPAP
- Parts Analysis for Additive Manufacturing
## Integration Process

<table>
<thead>
<tr>
<th>Who?</th>
<th>Where?</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application administrator</td>
<td>SAP S/4HANA Cloud</td>
<td>Create a communication user for inbound communication.</td>
</tr>
<tr>
<td></td>
<td>Communication Users app</td>
<td>Create a Communication User [page 303]</td>
</tr>
<tr>
<td></td>
<td>Communication Systems app</td>
<td>Create a communication system that represents Network.</td>
</tr>
<tr>
<td></td>
<td>Create a Communication System [page 303]</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Communication Arrangements app</td>
<td>Create a communication arrangement.</td>
</tr>
<tr>
<td></td>
<td>Create a Communication Arrangement [page 305]</td>
<td></td>
</tr>
<tr>
<td>SAP Business Technology Platform account administrator</td>
<td>SAP Business Technology Platform cockpit</td>
<td>Create a destination for the SAP S/4HANA Cloud system to establish its communication with SAP Business Technology Platform.</td>
</tr>
<tr>
<td></td>
<td>SAP S/4HANA Cloud Destination Properties [page 319]</td>
<td></td>
</tr>
<tr>
<td>Application administrator</td>
<td>Network</td>
<td>Maintain the information of the SAP S/4HANA Cloud system.</td>
</tr>
<tr>
<td></td>
<td>Application Settings app</td>
<td>Maintain SAP S/4HANA Cloud Systems [page 312]</td>
</tr>
<tr>
<td></td>
<td>Company Profile app</td>
<td>Maintain the information of the subsidiaries.</td>
</tr>
<tr>
<td></td>
<td>Maintain Subsidiaries [page 314]</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Business Partners app</td>
<td>Establish connections with the suppliers and maintain the supplier information.</td>
</tr>
<tr>
<td></td>
<td>Maintain Suppliers [page 316]</td>
<td></td>
</tr>
</tbody>
</table>
6.2.1 Configuration Tasks in SAP S/4HANA Cloud

Establish secure communication between SAP S/4HANA Cloud and Network using the communication management apps.

Prerequisites

- The SAP S/4HANA Cloud version is 1705 or higher.
- You have the required permissions. For more information, see Applications for General Functions for Key Users.

Procedure

1. Create a communication user for inbound communication.
2. Create a communication system that represents Network.
3. Create a communication arrangement.

6.2.1.1 Create a Communication User

Create a communication user for Network. Network uses this user for inbound communication to SAP S/4HANA Cloud.

In the Maintain Communication Users app, create a communication user. For details, see Maintain Communication Users.

i Note
Please use the basic authentication method and define a secure password for the communication user.

6.2.1.2 Create a Communication System

Create a communication system that represents Network and assign the previously created communication user for inbound communication.

In the Maintain Communication Systems app, create a communication system. For details, see Maintain Communication Systems.
The following table provides information about fields that require additional explanation for different integration scenarios:

<table>
<thead>
<tr>
<th>Field</th>
<th>Scenario: Request for Quotation</th>
<th>Scenario: Quality Info Record Integration</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Host Name</td>
<td>public-api-endpoint in the SAP Digital Manufacturing Cloud service key</td>
<td>bestrun-fnd-api-gateway-ms.cfapps.eu20.hana.ondemand.com</td>
<td></td>
</tr>
<tr>
<td>UI Host Name</td>
<td>/</td>
<td>URL for the Collaboration Rooms app in SAP Digital Manufacturing Cloud bestrun.execution.eu20.dm.cloud.sap /cp.portal/site##CollaborationRoom-Display</td>
<td></td>
</tr>
</tbody>
</table>
| Auth. Endpoint      | /                               | url in the SAP Digital Manufacturing Cloud service key plus /oauth/authorize With url in the service key being bestrun.authentication.eu20.hana.ondemand.com:  
  - Token Endpoint: bestrun.authentication.eu20.hana.ondemand.com /oauth/token |
| Token Endpoint      | /                               | url in the SAP Digital Manufacturing Cloud service key plus /oauth/token |
| User for Inbound Communication | The communication user created previously, using basic authentication (user name and password) | / |
Related Information

Prepare for API Integration

6.2.1.3 Create a Communication Arrangement

Create a communication arrangement for the previously created communication system and define the communication scenario.

In the Maintain Communication Arrangements app, create a communication arrangement. For details, see Maintain Communication Arrangements.

Communication scenarios required for different integration:

- Request for Quotation: SAP_COM_0077 (Distributed Manufacturing Integration)
- Quality Info Record integration: SAP_COM_0557 (Digital Manufacturing Cloud for Network with Quality Info Record Integration)

6.3 Integrate with SAP S/4HANA

Integrate Network with an SAP S/4HANA system.

Supported Integration Scenarios

- Request for Quotation
- Parts Analysis for Additive Manufacturing
### Integration Process

<table>
<thead>
<tr>
<th>Who?</th>
<th>Where?</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>System administrator</td>
<td>A server on the same Intranet as the SAP S/4HANA server</td>
<td>Configure a cloud connector to connect to the SAP S/4HANA system over the HTTPS protocol.</td>
</tr>
<tr>
<td>SAP S/4HANA system</td>
<td></td>
<td>Setting Up the Cloud Connector [page 13]</td>
</tr>
<tr>
<td>SAP Business Technology</td>
<td>SAP Business Technology Platform cockpit</td>
<td>For the request for quotation integration process, activate the OData services API_PRODUCT_SRV and API_RFQ_PROCESS_SRV.</td>
</tr>
<tr>
<td>Platform account administrator</td>
<td></td>
<td>For the quality info record integration for PPAP, activate the OData service API_QUALITYINFORECORD_SRV.</td>
</tr>
<tr>
<td>Application administrator</td>
<td>Network</td>
<td>Create a destination for the SAP S/4HANA system to establish its communication with SAP Business Technology Platform.</td>
</tr>
<tr>
<td>Network Settings app</td>
<td></td>
<td>On-Premises System Destination Properties [page 319]</td>
</tr>
<tr>
<td>Application Settings app</td>
<td></td>
<td>Maintain the information of the SAP S/4HANA system.</td>
</tr>
<tr>
<td>Company Profile app</td>
<td></td>
<td>Maintain SAP S/4HANA Systems [page 313]</td>
</tr>
<tr>
<td>Maintain Subsidiaries</td>
<td></td>
<td>Maintain Subsidiaries [page 314]</td>
</tr>
<tr>
<td>Business Partners app</td>
<td></td>
<td>Maintain the information of suppliers.</td>
</tr>
<tr>
<td>Maintain Suppliers</td>
<td></td>
<td>Maintain Suppliers [page 316]</td>
</tr>
</tbody>
</table>

### Supported Integration Scenario

- Part integration for PPAP
Prerequisites

- The SAP S/4HANA version is 1511 or above.
- The VDS files are stored in the Document Management System (DMS) of SAP S/4HANA rather than managed by any third-party document storage services or tools.
- You have configured the logon data for your content server, as follows:
  1. Execute transaction SICF.
  2. Select SERVICE as the hierarchy type and then choose Execute.
  3. On the External Aliases tab, select default_host sap/bc/contentserver and then choose Display/Change.
  4. On the Logon Data tab, choose Change.
  5. Select Required with Logon Data for the procedure, enter the client, and enter a valid user name and password.
  6. Save the changes.

  **i Note**
  If you configure different content servers for different plants, the logon data (user name and password) must be the same for all content servers.

- You have configured the SAP Cloud Integration service to connect SAP S/4HANA and SAP Digital Manufacturing Cloud for outbound data transfer from SAP S/4HANA. For instructions, please refer to the Administration Guide for Execution

  **i Note**
  Unless otherwise specified, the "SAP Business Technology Platform account" in this document refers to your Cloud Foundry global account. In this integration scenario only, we need to differentiate between the same Cloud Foundry account and a Neo account that is provisioned for and dedicated to the configurations of the SAP Cloud Integration service.

Integration Process

<table>
<thead>
<tr>
<th>Who?</th>
<th>Where?</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application administrator</td>
<td>SAP S/4HANA</td>
<td>Follow the instructions in 2683890 to transfer document URLs via IDoc ZMNMAT03. This is a prerequisite for transferring the VDS file associated with a material (part) from SAP S/4HANA.</td>
</tr>
<tr>
<td>System administrator</td>
<td>A server on the same Intranet as the SAP S/4HANA server</td>
<td>Configure a cloud connector to connect to the SAP S/4HANA system over the HTTPS protocol. Setting Up the Cloud Connector [page 13]</td>
</tr>
</tbody>
</table>
### 6.4 Integrate with SAP Ariba

Integrate Network with SAP Ariba.

**i Note**

This integration scenario depends on the request for quotation integration with SAP S/4HANA Cloud and SAP S/4HANA.

#### Supported Integration Scenario

- Sourcing through SAP Ariba
## Integration Process

<table>
<thead>
<tr>
<th>Step</th>
<th>Where</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>SAP Ariba</td>
<td>Export vendors</td>
</tr>
<tr>
<td></td>
<td></td>
<td><a href="#">Export Vendors from SAP Ariba</a></td>
</tr>
<tr>
<td>2</td>
<td>Network</td>
<td>Import Ariba vendors to Network</td>
</tr>
<tr>
<td></td>
<td></td>
<td><a href="#">Import Ariba Vendors to Network</a></td>
</tr>
<tr>
<td>3</td>
<td>SAP Ariba</td>
<td>Configure document URL endpoint</td>
</tr>
<tr>
<td></td>
<td></td>
<td><a href="#">Configure Document URL Endpoint</a></td>
</tr>
<tr>
<td>4</td>
<td>SAP Ariba</td>
<td>Configure DocumentURLOutBound web service</td>
</tr>
<tr>
<td></td>
<td></td>
<td><a href="#">Configure DocumentURLOutBound Web Service</a></td>
</tr>
</tbody>
</table>

## Related Information

**Work with SAP Ariba Sourcing**

### 6.4.1 Export Vendors from SAP Ariba

Run the *Export Organization with vendor keys (zipped CSV)* task to export vendor information into a CSV file, which will be used for importing the vendors into Network.

## Context

The CSV file is comma-delimited and have the following headers:

- VendorID
- SiteID
- LocationID
- SystemID
- BusinessSystemID
**6.4.2 Import Ariba Vendors to Network**

Import Ariba vendors to Network. Then map the Ariba vendors to suppliers in Network.

**Prerequisites**

- You have the name for your Ariba realm.
  
  **i Note**
  
  Only one realm is supported in this release.
- You have exported the vendors from SAP Ariba into a CSV file.

**Context**

By mapping an Ariba vendor to a Network supplier, a 1-1 relationship is established.

**Procedure**

1. Open the *Manage Integrations* app.
2. Choose the *Edit* button.
3. Specify your Ariba realm.
   
   **i Note**
   
   The realm name is case-sensitive.
4. Import the Ariba vendor list.
5. For each Ariba vendor, in the *Supplier* column, specify a Network supplier.

   If you can’t find the right Network supplier, select *Not Onboarded*.

   **i Note**
   
   If an Ariba vendor is not yet onboarded to Network, do not delete this record. Otherwise, the vendor loses the chance to enter the collaboration room even if onboarded later.
6. Save the changes.

### 6.4.3 Configure Document URL Endpoint

Configure a document URL endpoint for outbound communication with Network.

#### Prerequisites

- Your SAP Business Technology Platform subaccount trusts the default identity provider - SAP ID service.
- You have a technical user managed by the SAP ID service. This technical user is required for basic authentication between SAP Ariba and Network. You can apply for such a user at [www.sap.com](http://www.sap.com).
- You have copied the document URL endpoint from the Manage Integrations app of Network.

#### Context

By configuring a document URL, a link is generated for each request for quotation created in Network and sent to an ERP system integrated with SAP Ariba Sourcing. Following the link, an Ariba vendor enters a collaboration room in Network to collaborate with your organization.

In the Integration Manager, configure an endpoint with the following information:

<table>
<thead>
<tr>
<th>Field</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type</strong></td>
<td>Outbound</td>
</tr>
<tr>
<td><strong>URL</strong></td>
<td>Document URL endpoint in the Manage Integrations app of Network</td>
</tr>
<tr>
<td><strong>HTTP Authentication</strong></td>
<td>User account managed by the SAP ID service</td>
</tr>
</tbody>
</table>
6.4.4 Configure DocumentURLOutBound Web Service

After configuring a document URL endpoint, configure the DocumentURLOutBound web service.

Procedure

1. A template author sets the Enable document URL terms event rule under Project Owner Actions to Yes.
2. A template author adds the global term Document URL to the Line Item definition in a Request for Proposal sourcing template.
3. An administrator uses the Integration Manager to configure and enable the DocumentURLOutBound web service.

   Be sure to use the endpoint configured for Network.

6.5 Configuration Tasks in Network

Make appropriate configurations in Network so that the users can send the right data to the right SAP S/4HANA Cloud system.

Procedure

1. Maintain the information of each SAP S/4HANA Cloud system.
2. Maintain the company information of each subsidiary that uses an SAP S/4HANA Cloud system.
3. Maintain the information of each supplier.

6.5.1 Maintain SAP S/4HANA Cloud Systems

For each SAP S/4HANA Cloud with which you want to communicate, maintain its information in Network.

Prerequisites

A destination has already been created in your SAP Business Technology Platform subaccount for each integrating SAP S/4HANA Cloud system. For more information, see Create a Destination in an SAP Business Technology Platform Subaccount [page 318].
Procedure

1. Open the Application Settings app.
2. From the side navigation menu, choose External Systems.
3. Choose Add and select SAP ERP.
4. In the Add System window, enter the information as follows:

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>System Name</td>
<td>Specify the system name in this format: <code>&lt;Integrating System Name&gt;_&lt;Client ID&gt;</code>. For example, CC2_007.</td>
</tr>
<tr>
<td>Client</td>
<td>Client ID for the integrating system</td>
</tr>
<tr>
<td>System Status</td>
<td>Set it to Active. Otherwise, data (for example, requests for quotation) could not be posted to the integrating system.</td>
</tr>
<tr>
<td>Additional Information</td>
<td>Enter the name of the SAP S/4HANA Cloud destination. Maintain the destination name in this format: <code>S4ODataDest=&lt;Destination Name&gt;</code>. For example, for the SAP S/4HANA Cloud system represented by the destination “S4-NY001”, enter <code>S4ODataDest=S4-NY001</code>.</td>
</tr>
<tr>
<td>Primary System</td>
<td>Keep the default setting.</td>
</tr>
</tbody>
</table>

5. Save the system.

6.5.2 Maintain SAP S/4HANA Systems

For each SAP S/4HANA with which you want to communicate, maintain its information in Network.

Procedure

1. Open the Application Settings app.
2. From the side navigation menu, choose External Systems.
3. Choose Add and select SAP ERP.
4. In the Add System window, enter the information as follows:
### Field Description

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>System Name</strong></td>
<td>Specify the system name in this format: <code>&lt;Integrating System Name&gt;_&lt;Client ID&gt;</code>.&lt;br&gt;For example, CC2_007</td>
</tr>
<tr>
<td><strong>Client</strong></td>
<td>Client ID for the integrating system</td>
</tr>
<tr>
<td><strong>System Status</strong></td>
<td>Set it to <strong>Active</strong>. Otherwise, data (for example, requests for quotation) could not be posted to the integrating system.</td>
</tr>
<tr>
<td><strong>Additional Information</strong></td>
<td>Enter the name of the SAP S/4HANA destination.&lt;br&gt;Maintain the destination name in this format: <code>S4ODataDest=&lt;Destination Name&gt;</code>. For example, for the SAP S/4HANA system represented by the destination &quot;S4-NY001&quot;, enter <code>S4ODataDest=S4-NY001</code>.</td>
</tr>
<tr>
<td><strong>Primary System</strong></td>
<td>Keep the default setting.</td>
</tr>
</tbody>
</table>

5. Save the system.

### 6.5.3 Maintain Subsidiaries

For the request for quotation integration scenario, you need to maintain the relevant subsidiary information. A subsidiary is represented by a company code and has an integrating ERP system assigned to it.

Except for the company code, some other information (for example, plant, purchasing organization) must also be maintained.

**Note**

Even if a company doesn’t have any subsidiaries or is the parent company itself, create a subsidiary to represent it. For example, create a subsidiary named as **Headquarters**.

### 6.5.3.1 Create a Subsidiary

Create a subsidiary in the company profile.

**Procedure**

1. Open the **Company Profile** app.
2. On the **Subsidiaries** tab, choose **New**.
3. Enter all required information and then save the subsidiary.

### 6.5.3.2 Maintain Subsidiary Information

For the request for quotation integration scenario, maintain the company code, plant code, and other information for a subsidiary. Additionally, assign the relevant external system to this subsidiary.

#### Procedure

1. Open the **Company Profile** app.
2. On the **Subsidiaries** tab, select the subsidiary for which you want to maintain information.
   - The subsidiary details are displayed in a new page.
3. Choose **External IDs**.
4. In the **External IDs** window, choose **Add**.
5. In the **Add External ID** window, select the appropriate system and then in the **External ID** field, maintain the relevant information.
   - Maintain the information in the following format: `CC=<Company Code>; PO=<Purchasing Organization ID>; PG=<Purchasing Group ID>; DT=RE; PT=<Name of Plant 1>:<ID of Plant 1>,<Name of Plant 2>:<ID of Plant 2>
   - Note that the document type (DT) must be “RE”.
6. Save the external ID.
7. If the subsidiary uses more than one SAP S/4HANA Cloud system, repeat the previous steps and create an external ID for each system.

#### Example

You have the following information in SAP S/4HANA Cloud for a subsidiary:

<table>
<thead>
<tr>
<th>Field</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Company Code</td>
<td>1002</td>
</tr>
<tr>
<td>Purchasing Organization ID</td>
<td>P001</td>
</tr>
<tr>
<td>Purchasing Group ID</td>
<td>PG6</td>
</tr>
<tr>
<td>Document Type for Requests for Quotation</td>
<td>RE</td>
</tr>
<tr>
<td>Plant Name</td>
<td>New York Plant</td>
</tr>
</tbody>
</table>
Specify the external ID for the subsidiary as follows:

\[ \text{CC=1002;PO=P001;PG=PG6;DT=RE;PT=New York Plant:NY1} \]

### 6.5.4 Maintain Suppliers

Establish connection with suppliers and maintain relevant information.

To create a request for quotation for a supplier, the supplier must have an established relationship with your organization. This can be achieved in two ways:

- **Connect with the supplier**
  
  For more information, see [Establish Connection with Suppliers](#).

- **Add the supplier as an invitee organization**
  
  For more information, see [Checklist for Creating a Private Organization](#).

In addition, the external ID of the supplier in the SAP S/4HANA Cloud system must also be maintained. For more information, see [Maintain the External ID of a Supplier](#).

### 6.5.4.1 Establish Connection with Suppliers

Establish connection with a supplier so as to create requests for quotation for the supplier.

**Prerequisites**

The supplier is also registered with Network.

**i Note**

If a supplier doesn’t have the intention at the moment to subscribe to the services of Network, you can create a private supplier instead. For more information, see [Checklist for Creating a Private Organization](#).

**Context**

To establish connection, either your organization or the supplier organization must send a connection request. After the receiving organization accepts the request, the two organizations become connected.
**Procedure**

1. Open the *Business Partners* app.
2. To send connection requests, do the following:
   a. On the *Connections* tab, choose *Add*.
   b. In the *Add Connection* window, select one or more suppliers.
   c. Choose *Send Connection Request*.

   A connection request is sent to each selected supplier. The suppliers appear on the *Outgoing* tab.
3. To accept connection requests, do the following:
   a. On the *Incoming* tab, select a supplier.
   b. Select *Accept*.
   c. Repeat the previous steps for other suppliers.

   Your organization is now connected with the selected suppliers. These suppliers appear on the *Connections* tab.

**Next Steps**

Wait for the suppliers who've received your connection request to accept it.

**6.5.4.2 Maintain the External ID of a Supplier**

Maintain the supplier ID (vendor ID) that is defined in an ERP system.

**Context**

ID mapping helps the ERP system to "recognize" the supplier organization.

**i Note**

You don't have to wait for a supplier to accept your connection request to maintain the external ID.

**Procedure**

1. Open the company profile of the supplier.
   ○ For a regular supplier: In the *Business Partners* app, on the tab where the supplier is displayed (for example, *Connections* or *Outgoing* tab), select the supplier.
For a private supplier: In the Company Profile app, on the Invitees tab, select the supplier.

2. Choose External IDs.
   - The External IDs window is displayed.
3. Choose Add.
   - The Add External ID window is displayed.
4. Select the appropriate system, specify the object type, and then enter the supplier ID (for example, 100156).
5. Save the external ID.
6. If this supplier has a business relationship with more than one subsidiary and the supplier information is maintained in more than one ERP system, add more external IDs.

### 6.6 Create a Destination in an SAP Business Technology Platform Subaccount

Create a destination to exchange data between SAP Business Technology Platform and another system.

**Prerequisites**

You are a member of the SAP Business Technology Platform global account.

**Procedure**

1. Go to your subaccount.
   - a. Log on to the SAP BTP Cockpit and select a region.
   - b. Select a global account.
   - c. Select a subaccount.
2. Choose Connectivity Destinations.
3. Choose New Destination.
4. Enter a meaningful name for the destination and provide all required information.
5. Save the destination.
6.6.1 SAP S/4HANA Cloud Destination Properties

Below are the required destination properties for integrating with an SAP S/4HANA Cloud system.

**i Note**
For each SAP S/4HANA Cloud system, create a separate destination.

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>Enter an identifiable and unique name.</td>
</tr>
<tr>
<td>Description</td>
<td>[Optional] Enter a description for the destination.</td>
</tr>
<tr>
<td>Type</td>
<td>HTTP</td>
</tr>
<tr>
<td>Proxy Type</td>
<td>Internet</td>
</tr>
<tr>
<td>Authentication</td>
<td>BasicAuthentication</td>
</tr>
<tr>
<td>User</td>
<td>Enter the name and password for the communication user created in SAP S/4HANA Cloud.</td>
</tr>
<tr>
<td>Password</td>
<td></td>
</tr>
<tr>
<td>Property</td>
<td>Value</td>
</tr>
<tr>
<td>-----------------</td>
<td>----------------------------------------------------------------------</td>
</tr>
<tr>
<td>Description</td>
<td>[Optional] Enter a description for the destination.</td>
</tr>
<tr>
<td>Type</td>
<td>HTTP</td>
</tr>
<tr>
<td>Location ID</td>
<td>If this field is maintained in the cloud connector, enter the same value; otherwise, keep it empty.</td>
</tr>
<tr>
<td>URL</td>
<td>https://&lt;Virtual_Host&gt;:&lt;Virtual_Port&gt;/sap/opu/odata/SAP/</td>
</tr>
<tr>
<td></td>
<td><strong>Note</strong></td>
</tr>
<tr>
<td></td>
<td>The virtual host and port is specified in the cloud connector for the particular on-premises system.</td>
</tr>
<tr>
<td>Proxy Type</td>
<td>OnPremise</td>
</tr>
<tr>
<td>Authentication</td>
<td>BasicAuthentication</td>
</tr>
<tr>
<td>User</td>
<td>Enter the name and password for a user in the on-premises system.</td>
</tr>
<tr>
<td>Password</td>
<td></td>
</tr>
</tbody>
</table>

**Related Information**

Integrate with SAP S/4HANA [page 305]
Important Disclaimers and Legal Information

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